The Australian Journal of Herbal Medicine is a quarterly publication of the National Herbalists Association of Australia. The Journal publishes material on all aspects of western herbal medicine and is a peer reviewed journal with an Editorial Board.

Members of the Editorial Board are:

Jane Frawley MClinSc BHSc(CompMed) DBM GradCertAppSc
Katoomba NSW Australia

Stuart Glastonbury MBBS BSc(Med) DipWHM
Toowoomba Queensland Australia

Erica McIntyre BScSc(Psych)(Hons) BHSc DipBM
Blackheath NSW Australia

Andrew Pengelly PhD BA DBM ND
Laurel Maryland United States of America

Amie Steel MPH, GradCertEd, ND
Brasheen Queensland Australia

Janelle Wheat PhD MMedRadSc(Nuclear Medicine) MHSc(herbal medicine) BAppSc(radiography)
Wagga Wagga NSW Australia

Dawn Whitten BNat
Hobart Tasmania Australia

Hans Wohlmann PhD BSc
Ballina NSW Australia

The Editorial Board advises on content, structure and standards for the Journal, keeping it relevant to the profession of herbal medicine. Peer reviewers will come from the Editorial Board as well as being sourced globally for their expertise in specific areas. Contributions are invited to the journal. Instructions for contributors can be found on the inside back page.

The NHAA was founded in 1920 and is Australia’s oldest national professional body of herbal medicine practitioners.

The Association is a non profit member based association run by a voluntary Board of Directors with the help of interested members. The NHAA is involved with all aspects of western herbal medicine.

The primary role of the association is to support practitioners of herbal medicine:

-  Promote, protect and encourage the study, practice and knowledge of western herbal medicine.
-  Promote herbal medicine in the community as a safe and effective treatment option.
-  Maintain and promote high educational standards for practitioners of herbal medicine.
-  Encourage the highest ideals of professionalism and ethical standards for practitioners of herbal medicine.
-  Advocate ethical and sustainable methods of growing, harvesting and manufacturing herbal medicines.
-  Provide peer support for practitioners and students of herbal medicine.

There are four categories of NHAA membership:

**Full membership**
Practitioners who have undertaken formal studies in the health sciences and the principles and practice of herbal medicine.
Annual fee $250 and a $30 joining fee.

**Full ATSI membership**
Aboriginal and Torres Strait Islander practitioners who have undertaken formal studies in bush medicine and Western herbal medicine.
Annual fee $60 and a $5 joining fee.

**Student membership**
Students who are currently undertaking studies in western herbal medicine.
Annual fee $65 and a $10 joining fee.

**Companion membership**
Companies, institutions or individuals involved with some aspect of herbal medicine.
Annual fee $160 and a $20 joining fee.

**Corporate membership**
Companies, institutions or individuals interested in supporting the NHAA.
Annual fee $3000.00.
All prices include GST

Enquiries: Office Manager
PO Box 45
Concord West NSW 2138
Email: nhaa@nhaa.org.au
Street address: 4 Cavendish Street
Concord West NSW 2138

Editor: Jane Frawley
Email: editorajhm@nhaa.org.au
Telephone: (02) 8765 0071 + 61 2 8765 0071
Fax: (02) 8765 0091 + 61 2 8765 0091
Website: www.nhaa.org.au

Editorial Committee:
Erica McIntyre (Blackheath NSW)
Stuart Glastonbury (Toowoomba QLD)
Jane Frawley (Katoomba NSW)

Proofreaders:
Greg Whitten (Hobart TAS)
Kath Giblett (Perth WA)
At the same time as the very successful National Herbalists Association of Australia’s (NHAA) international conference, I had the great fortune to attend the International Congress for Complementary Medicine Research (ICCMR) in London. This was the 8th congress of the International Society for Complementary Medicine Research (ISCMR) which is held in different cities around the world annually.

ICCMR is one of the leading meetings for academic researchers in the field of complementary medicine, with the ISCMR itself being established 10 years ago in London. Since then the ICCMR has gone from strength to strength, with the programme for this year’s congress containing 92 oral abstract presentations and 200 poster presentations from researchers representing 34 different countries around the globe. Additionally, presentations were delivered by over 20 local researchers representing various universities at the forefront of complementary medicine research in Australia, such as the University of Technology Sydney, Royal Melbourne Institute of Technology, University of Western Sydney and Monash University. The areas of research presented included basic science research, qualitative clinical research, qualitative clinical research, education and training and health services research, all in the field of complementary medicine. It was very exciting to see that Australian researchers are contributing on this international stage and that we are producing some exceptional research in this broad field.

On the local front, the NHAA also conducted its 8th International Conference on Herbal Medicine entitled ‘Tradition, Evidence and Integration’ on the 12th-14th of April 2013 in Melbourne. This conference is the NHAA’s premier event. It has always been a triennial event, but after such a successful conference, plans are afoot to meet biannually in the future. The conference attracted over 400 delegates from various countries around the world, including the United States of America, the United Kingdom, New Zealand, Uganda, Saudi Arabia, Indonesia, India, the United Arab Emirates and Bangladesh. There were 59 oral presentations, four panel discussions and 14 poster presentations delivered across three days. The presentations covered a broad range of topics including new clinical trials, clinical cases, emerging trends, regulation and the profession, education and training, quality of medicines and manufacturing, and growing and sustainability. Delegates met to network and thus contribute to research capacity building in this field.

It is heartening to see herbal medicine and complementary medicine research flourishing on a domestic front.

These are exciting times for complementary medicine research in Australia with the University of Technology Sydney announcing a new research centre - the Australian Research Centre in Complementary and Integrative Medicine (ARRCIM). In this edition, Professor Jon Adams details the founding of this national research centre and announces the ARRCIM International complementary medicine (CM) research Leadership Programme (Adams 2013).

I am also pleased to announce a new section for the Australian Journal of Herbal Medicine (AJHM) entitled Herbal Medicine Hypothesis. This section will contain articles on new theories and ideas in the field of herbal medicine. These ideas may be built on a strong basis of observation, or may hypothesise possible new clinical applications for herbal medicines based on biological plausibility due to known actions and chemical constituents. In all cases, future research will be needed to investigate these hypotheses, but it is hoped that this section may provide a platform for new ideas, theories and debate. The inaugural article for this new section is entitled “Eosinophilic oesophagitis (EoE): hypothetical herbal interventions for a rare and emerging gastrointestinal disorder” (Hannan 2013).

This edition also features part 2 of a health services research article which examines the behavioural patterns and attitudes of CAM practitioners towards communication and engagement with midwives (Steel 2013). Part 1 was published in 25(1) and explored the behavioural patterns and attitudes of midwives towards communication with CAM practitioners (Diezel 2013).

References

Adams J. 2013. Providing leadership in complementary medicine research: Introducing the Australian Research Centre in Complementary and Integrative Medicine (ARRCIM). Faculty of Health, University of Technology Sydney. AJHM 25:2;54-56.


Steel A, Diezel H, Wardle J, Johnstone K. 2013. Patterns of interprofessional communication between complementary and conventional practitioners providing maternity care services: a preliminary examination of the perceptions of CAM practitioner. AJHM 25:2;57-61, 73.
Nature’s Sunshine Products of Australia Pty Ltd
‘Over 30 Years in Australia’

Nature’s Sunshine Products of Australia Pty Ltd (NSP) commenced operations in Australia in February 1981 and while today the global organisation is a multimillion dollar business, its humble beginnings date back to hand packing capsicum pepper around a small kitchen table.

The NSP story began in 1972 when Gene Hughes, a school teacher, found himself in hospital after he had passed out from a bleeding ulcer. Some friends suggested he use red cayenne pepper (Capsicum) to ease his discomfort. Feeling desperate, Gene purchased a can of cayenne pepper and worked up to swallowing a heaped tablespoon daily. Within three months the ulcer was healing and the doctor was amazed. Gene tried to coax his wife Kristine into taking the red cayenne pepper as well, but swallowing a spoonful was no easy task, so Kristine came up with the innovative idea of putting the hot pepper into an easy to swallow gelatine capsule.

And so Nature’s Sunshine was born, with a handful of family members packing the red cayenne pepper into capsules by hand, filling bottles and selling the product to local stores.

These days the product line has expanded to over 600 herbal and nutritional products and the small family business has become a global company with subsidiary and related organisations located in sixty eight countries throughout the world, including Australia.

Today in Australia, NSP products are sold in health food stores, some pharmacies and via professional health care practitioners as well as select independent distributors.

Nature’s Sunshine Products has an enviable reputation as being of the highest quality, with consistency of ingredients and proven usage. We are proud of this history and will continue to adhere to these very strict standards, delivering the best possible health solutions for all Australians. This superior standard automatically positions our product as being a premium brand and in our pricing we will demonstrate value, which means the best solution for your money, but not necessarily the cheapest price.

...go with the Strength in Single Herbs

Turmeric is an Ayurvedic herb known for its anti-inflammatory and antioxidant properties.
Assists in the relief of the pain and swelling of inflamed joints.
Contains 526mg of Curcumin (C3) standardised to 500mg (95%) curcuminoids.

2013 Corporate Members

© National Herbalists Association of Australia 2013
I write with regard to a talk I attended at the recent International Conference in Melbourne. Overall, the conference was brilliant, but I did have some concerns with Dr. Jason Hawrelak’s presentation on probiotics.

Probiotic research progression is remarkable and occupying significant space in contemporary medical journals. Bearing this in mind, Dr. Hawrelak’s references were generally over 10 years old, the oldest being from 1996. There was only one recent reference from 2011. Since then, much has changed in the world of probiotics.

In essence, I agree with most of the slides presented. The sentiment of choosing specific strains for a therapeutic purpose is something well established in the literature. Unfortunately, there is a long way to go in this type of specific research and, in particular, relating strains to antibiotics.

There are only a few manufacturers for probiotics around the world. Most nutraceutical companies are supplied by the same manufacturers and therefore there is much cross-over in strains between brands. Subsequently, most responsible nutraceutical brands can supply information on the specific strains used relative to the claims made.

Dr Hawrelak presented a slide demonstrating the poor viability of finished products in the UK. What he failed to point out was that the experience of other countries does not necessarily correlate with the experience in Australia. A unique aspect of supplement regulation in Australia is that manufacturers must conform to standards set by the Therapeutic Goods Administration (TGA), including evidence of viability and stability. For TGA purposes there is an allowable product variability of 10% of the label claim on expiry.

As a company, we spend a fortune on strain identification, specific claims and stability trials. However, with 20 years of experience we found that the most important factor in the protection of probiotics is to use probiotic experienced packers and specific packaging to ensure that products remain viable. Critically, you must keep moisture out. This relates to refrigerated and room temperature-stable bacteria.

Dr. Hawrelak suggested importing probiotic products. Aside from cost this has many issues. Firstly, the TGA ensures minimum standards of hygiene in manufacture and viability through stability. Secondly, the effects of heat and moisture typically associated with travel will generally have a negative impact on imported probiotics. Thirdly, a side effect or reaction caused by an unapproved (by TGA) product may have legal consequences. This has not been legally tested as yet, but would you want to be the first?

The consumption of quality foods for health is a foundation stone of our belief. In this light, Dr. Hawrelak recommended yoghurts for therapy. Yoghurt and fermented foods should certainly form part of a prevention program, but as a food they do not answer to TGA, so what evidence exists to confirm viability of bacteria on expiry? Once the energy source (sugar) is consumed, the bacterial count drops markedly. Many types of yoghurt also contain many artificial components and excessive sugars.

Whilst the fundamentals of Dr. Hawrelak’s seminar were generally sound, I believe the information was dated and undermined the work of professional nutraceutical companies in Australia.

Daniel Baden ND
Director
Biomedica Nutraceuticals
Sydney
To the Editor

I would like to thank the Australian Journal of Herbal Medicine for facilitating the continuation of the probiotic discussion beyond the International Conference. Mr. Baden of Biomedica Nutraceuticals has raised some concerns with some aspects of my presentation—Probiotics: Sorting the Strain from the Chaff. I will address the points made by Mr. Baden below.

Use of older references

The fundamental principles behind choosing a superior probiotic supplement have not changed much in the past decade. What has changed is the level of research on these superior strains and elucidation of mechanisms of action. A 30-minute presentation was too brief to go into the latter and the former are detailed in Appendix 1—a 27 page document summarising the results of nearly 140 clinical trials on specific probiotic strains that I thought would be included in the conference proceedings and were available to delegates on the day.

With regard to fundamental principles, the desirable probiotic characteristics laid out by Mattila-Sandholm and Salminen in 1998 still hold true today—gastric acid and bile salt stability, adherence to enterocytes, antagonism against potentially pathogenic organisms and most importantly evidence of efficacy (Mattila-Sandholm and Salminen 1998). These qualities are just as desirable now as they were in the late 1990s.

Interestingly, I noticed when looking through some of the Biomedica probiotic pamphlets (Proflora and Triflora) that Biomedica uses one of the same “old” references I did, as well as a number of references that date from the early 1990s, and even one from 1982.

I do not believe that clinical trials conducted in 1996, 2009 or even 1982 become invalid solely through the passage of time. Careful critiquing of clinical trial methodology is needed to assess the validity of any study, regardless of the date it was published. Further, it is continuing research that can provide additional support for, or refute, a previous finding, not the course of time.

Whilst I do agree with Mr. Baden that probiotic research progression has been remarkable in the past decade, I disagree with Mr. Baden’s assertion that there is a “long way to go” with strain-specific prescribing. There are in fact numerous studies demonstrating the efficacy of specific strains for specific health issues and a number particularly on the prevention of antibiotic-associated side effects.

Probiotic supplement labelling accuracy

In the “supplements vs. yoghurts” section of the presentation I did highlight research looking at probiotic supplements in the UK where only 7 of 21 products on the market met their label claims (Hamilton-Miller et al. 1999). This is, unfortunately, not an isolated case. Microbial analyses of probiotic products in Canada (Huff 2004), the USA (Marcobal et al. 2008), Italy (Aureli et al. 2010), Poland (Szajewska et al. 2004), South Africa (Elliot and Teversham 2004) and more broadly in Europe (Temmerman et al. 2003) have consistently shown that the identity and number of recovered species seldom correspond to those stated on the label. This has occurred in pretty much every market where probiotic supplement counts have been independently assessed. Would the outcome be different in Australia? I certainly hope so, but I would love to see independent assessment of Australian supplements to give a clear answer.

I am aware that in Australia sponsors are supposed to hold data in support of their label claims, including stability data. Over the past decade there have unfortunately been a number of incidences of Australian companies not having the data on hand to support their label claims.

Overseas probiotic strains

With regard to Appendix 2, where I detail the supplements and yoghurts in which the best researched probiotic strains can be found, there are, disappointingly, some well-researched strains not currently available in Australia. Appendix 2 is mostly concerned with strains that we have easy access to. Fortunately, this is most of them as some Australian suppliers have gone to great effort to source these well-researched strains. My main intention with the overseas listings in Appendix 2 was to make sure that practitioners didn’t make the incorrect assumption that a well-researched strain was available in Australia when it is not. Regrettably, there are still some Australian companies that extrapolate research results across strains (i.e. suggest research data on one strain is applicable to another strain) and inappropriately use this to promote their products (Martel 2011). I like to think this is done out of ignorance rather than opportunism to capitalise on practitioner trust.

With regard to talking to patients about ordering a specific probiotic supplement from overseas, let’s consider the following clinical scenario. You’ve been treating a patient with ulcerative colitis (UC) who is currently going through a flare-up – 3-5 bloody bowel movements per day and severe pain. Corticosteroid therapy has not helped; nor have any of the other options you’ve tried (herbs, dietary alterations and the well-researched probiotic strains that have shown efficacy in UC that are available in Australia—VSL#3 and Lactobacillus rhamnosus GG). Additionally, they react badly to the other pharmaceutical options. Would I discuss the potential for them to order for their personal use the probiotic strain Escherichia coli Nissle 1917, a
product demonstrated to help induce and maintain UC remission (Rembacken et al. 1999), made under strict pharmaceutical GMP in Germany, that has been sold in Germany for nearly 100 years and has an excellent safety profile in clinical trials? Yes, I would. In my opinion, one of our primary functions as healthcare professionals is to help patients make informed decisions about their health. They need to know their options and the potential risks and benefits of these options.

Yoghurt vs. supplements as therapeutic tools

The two yoghurts I specifically mentioned in my lecture, and the only two I consider “medicinal yoghurts”, are Vaalia and Activia. Vaalia contains the well-characterised and researched strains Lactobacillus rhamnosus GG, Lactobacillus acidophilus La5 and Bifidobacterium lactis Bb12. Activia contains Bifidobacterium animalis DN 173 010 in addition to the standard yoghurt-producing bacteria. There are a number of trials that have used medicinal yoghurts containing these probiotic strains to good effect—for example the prevention of antibiotic-associated diarrhoea (Sittonen et al. 1990), constipation (Yang et al. 2008) and irritable bowel syndrome (Agrawal et al. 2009), the eradication of vancomycin-resistant enterococci colonisation (Manley et al. 2007) and to decrease rates of respiratory tract infections in toddlers (Hojsak et al. 2010), to name a few. There is now no doubt that medicinal yoghurt containing select, well-characterised and researched probiotic strains have therapeutic efficacy.

An independent market-basket survey conducted in 1999 investigated a number of Australian yoghurts to see if they contained the strains listed on the label in sufficient quantities to produce therapeutic effects. Vaalia yoghurt was found to contain therapeutic quantities of Lactobacillus rhamnosus GG and Lactobacillus acidophilus La5 until its expiration date (Choice 1999). Activia was not available at that point in time for assessment but has a number of clinical trials demonstrating its efficacy.

Concluding remarks

Despite some differences in opinion, it would appear that Mr Baden and I share some common goals, such as practitioner access to good quality probiotic products containing therapeutic probiotic strains and access to accurate, up-to-date information on probiotics.

References


Marteau P. 2011. Evidence of probiotic strain specificity makes extrapolation of results impossible from a strain to another, even from the same species Annals of Gastroenterology & Hepatology 2:1;34-36.


Dr. Jason Hawrelak
ND, BNat (Hons), PhD, MNHAA
Illuminate Natural Medicine Pty Ltd
Hobart, Tasmania

© National Herbalists Association of Australia 2013
Providing leadership in complementary medicine research: Introducing the Australian Research Centre in Complementary and Integrative Medicine (ARCCIM), Faculty of Health, University of Technology Sydney

Professor Jon Adams
Professor of Public Health and Director, ARCCIM, Faculty of Health
University of Technology Sydney
Level 7 Building 10, 235-253 Jones St, Ultimo NSW 2007, Australia
Email: jon.adams@uts.edu.au

Introduction
An integral component of national and global health research systems is the development of the capacity to undertake health research effectively (Lansang and Dennis 2004). Such research capacity building is also essential for producing a sound evidence base that is relevant to, and of benefit for, practice and policy decision-making (Cooke 2005). This is as important for complementary medicine (CM), including herbal medicine, as for conventional medicine (Adams et al 2012a).

Unfortunately CM scholarship to date, both in Australia and internationally, has provided little focus or energy towards either ensuring direct impact from research into practice/policy or directly responding to the research capacity needs of the CM research field (Adams et al 2012b). However, some recent initiatives and developments do offer an excellent opportunity for CM research to address these challenges. The first such development has been the founding of the Australian Research Centre in Complementary and Integrative Medicine (ARCCIM) at the Faculty of Health, University of Technology Sydney.

As outlined in more detail below, ARCCIM offers a genuine break from previous research endeavours in CM. The Centre is committed to expanding the critical research gaze with regard to practice and practitioners of herbal medicine (amongst other CM) to include a diverse set of disciplinary approaches and methodologies often considered to constitute or lie within the broad areas of public health/health services research (epidemiology, biostatistics, health economics, etc). While the importance placed upon efficacy studies (via randomised controlled trials and other designs) remains imperative to the future of CM, there is nevertheless a recognition of late that research needs to also draw substantially upon accompanying methods and approaches in order to help adequately address the public health and health service challenges facing the broader Australian health care system (Adams 2008).

ARCCIM: Critical methods, translational research
ARCCIM has been established at the Faculty of Health, University of Technology Sydney to consolidate over 15 years of collaborative CM research activity and expertise (e.g. see Adams and Tovey 2003; Adams et al 2009a; Steinsbekk et al 2007; Pirotta et al 2010). The Centre will be officially launched later in 2013. The mission statement of ARCCIM is:

• To provide national and international leadership regarding critical public health and health services research that contributes to our understanding of the safety, efficacy and cost-effectiveness of CM use and practice;
• To subject CM practice and use to rigorous research methods and perspectives in order to provide a broad evidence base for patient care and health policy;
• To produce and disseminate research findings that inform best world practice and policy for stakeholders involved in community health, health service delivery and management
• To increase the depth and breadth of research capacity in relation to CM amongst both researchers and practitioners.

World-leading and premier national research centre: providing leadership in CM research
ARCCIM is a world-leading public health and health services research centre focused upon CM. It is the premier national research-intensive centre providing world-class expertise and leadership in CM research in Australia with a core focus upon providing insights of direct benefit to practice and policy.
Addressing unmet needs in complementary medicine research

ARCCIM is the only centre in Australia to bring together world-renowned, multidisciplinary researchers and methodologists with extensive experience in successfully partnering with practitioners and policymakers to develop a broad evidence base to inform care and decision-making regarding this significant and growing area of health care. This unique feature ensures that investigations are critical and rigorous while also maintaining sensitivity to practice realities.

Competitive external funding and internationally renowned expertise

ARCCIM is the only Australian centre to house senior academic staff awarded prestigious government fellowships (including Primary Health Care Research, Evaluation and Development (PHCRED) and National Health and Medical Research Council (NHMRC) fellowships) focused upon the critical examination of complementary medicine use, practice, and policy. The Centre has attracted the largest program of external competitive grant funding (~$7M) from such sources as Australian Research Council (ARC), NHMRC and PHCRED, Department of Health and Ageing for research into CM in Australia to date.

Empirical research

Our broad and growing program of empirical research draws upon rigorous methods and perspectives from across such areas as clinical health research, health economics, epidemiology, psychology and social science. This provides a critical, evidence base on topics as diverse as CM use and practice in women’s health (Frawley 2013; Hope-Allen et al 2004; Sibbritt et al 2006), rural health (Adams et al 2011; Wardle et al 2012), ageing care (Adams et al 2009b), primary health care (Adams and Tovey 2000; Adams 2003) and chronic illness care (Adams et al 2005; Broom and Adams 2009; Sibbritt and Adams 2010) amongst others.

Collaborative partnerships and bridging the researcher-practitioner divide

ARCCIM has long-standing collaborations and partnerships with a wide range of prestigious associations and organisations including the American Public Health Association, the Public Health Association of Australia, the Network of Researchers in the Public Health of CAM and the Indonesian Public Health Association amongst others (e.g. see Adams et al 2013). In addition, ARCCIM is also deeply committed to maintaining and advancing partnerships with the CAM practice community through activity and dialogue with representative organisations and associations across different modalities. As acknowledged in other health care fields, this is an important approach for health care provider groups in helping gain professional legitimacy and elevated status (Adams and Smith 2003) and is undeniably a core requirement for CM modalities and associations in advancing the interests of their members.

ARCCIM research capacity building initiatives

At the core of the ARCCIM approach to CM research development is a commitment to facilitate and initiate research capacity building for both practitioners and researchers. ARCCIM offers workshops/seminars for early career and advanced researchers as well as practitioners in a range of topics including quantitative and qualitative methods, systematic and critical reviews and increasing research engagement for developing practice. As the leading research-intensive CM centre in Australia we also offer excellent postgraduate supervision (Masters and PhD) as well as post-doctoral opportunities and provide collaborative input and consultancy services for regional, national and international research projects. In addition to these capacity building approaches, ARCCIM has also initiated an International CM Research Leadership Program.

ARCCIM International CM Research Leadership Program

ARCCIM is proud to announce the ARCCIM Leadership Program providing essential mentoring and career development around CM research with the ultimate goal of identifying, nurturing and supporting future Australian and international CM research leaders.

The ARCCIM Leadership Program will be open to international early-career and mid-career CM researchers (PhD through to 10 years post-PhD). Successful applicants will demonstrate an emerging track record in CM-focused scholarship and research output and illustrate excellent potential for and commitment to developing the national and international field of CM research. Researchers and practitioner-researchers with an interest and track record in a broad range of perspectives, disciplines and methodologies covering public health, health services research, health social science and clinical health research are all encouraged to apply.

Successful applicants will be Fellows of the Program and will be invited to ARCCIM, Faculty of Health, University of Technology Sydney annually for a minimum of 3 years. Each annual visit will provide opportunity and resources for Fellows to work on career development, strategic planning, and enhancing and broadening their research skills and experience. Invited speakers with national and international profiles from research, publishing and industry will facilitate sessions at the annual meetings, and ongoing support and mentoring will be provided by ARCCIM senior academics. The Program is fully funded and each Fellow appointed will be fully supported with travel expenses and accommodation for annual visits to Sydney, Australia.

The first intake of Fellows on the Program will take
place in early 2014. An official call for applications to join the Leadership Program will be made later in 2013.

References


Patterns of inter-professional communication between complementary and conventional practitioners providing maternity care services: a preliminary examination of the perceptions of CAM practitioner

Amie Steel¹,²,³, Helene Diezel¹, Jon Wardle¹, Kate Johnstone²
¹ Australian Research Centre in Complementary and Integrative Medicine, Faculty of Health, University of Technology Sydney, Ultimo NSW
² Embrace Holistic Services, www.embraceholistic.com
³ Contact author: amie.e.steel@uts.edu.au

Abstract: Inter-professional communication is well acknowledged as a vital piece in the practice of multi-disciplinary health care. Yet, even in health sectors such as maternity care where high rates of complementary and alternative medicine (CAM) use are well documented, there is little examination of the inter-professional communication patterns between CAM and conventional care providers. This study reports preliminary findings from a survey of CAM practitioners (n=31) which examines their perceived inter-professional communication patterns with conventional maternity care providers. The results indicate CAM practitioners may provide care to women from preconception care through to the postnatal period. The practitioners were most likely to receive referrals from other women or previous clients (sometimes: 41%; often: 27%), rather than from health professionals. Formal communication was most likely to be directed to other CAM practitioners (sometimes: 18%; often: 4%) and least likely to be directed to obstetricians (sometimes: 0%; often: 4%). No participants reported receiving formal communications from obstetricians but a small number indicated receiving formal communication from midwives (sometimes: 7%; often: 4%) and other CAM practitioners (sometimes: 17%; often: 4%). These low rates of communication may be impacting on patient safety through overtreatment or therapeutic interactions. There are concerns that policy and legislative barriers may be limiting the inter-professional communication practices of conventional care providers. Similarly, educational and regulatory weaknesses in CAM may be contributing to poor inter-professional communication practices for CAM practitioners. Further substantive research is needed to contextualise and verify these findings.

Introduction

Inter-professional communication is acknowledged as an important component in quality multi-disciplinary care. Workers in healthcare have professional groupings and different allegiances and this differentiates them from joint working practice in other contexts such as business and industry. One reason for this difference is that professional domains are not solely determined by internal professional perceptions. Research in the area of inter-professional dynamics in health care suggests that a number of factors influence the effectiveness of health professionals’ collaboration (Baxter and Brumfit 2008). As it is common for users of modern health care to engage with multiple care providers including CAM practitioners (Steel et al. 2012), communication between health practitioners across professional boundaries must occur, and is commonly achieved by exchanging and sharing information (Baxter and Brumfit 2008). Difficulties in inter-professional collaboration may arise, however, if practitioners relate to each other as representatives of their professions, rather than as individual practitioners (Kvarnstrom 2008). This may be of particular importance in instances of known professional animosity such as has been reported in maternity care (Adams 2006, Sleutel et al. 2007) and integrated medicine (Baer 2008, Broom and Tovey 2007).

Inter-professional communication between CAM and conventional maternity care providers

A recent review of the evidence (Adams et al. 2011) suggests that, in the maternity setting, conventional maternity care providers commonly practice, endorse, or refer women to, complementary and alternative medicine (CAM) – defined as treatments not included in conventional medical education and practice (Adams et al. 2003). This research identifies a wide range of CAM modalities including acupuncture/acupressure, aromatherapy, chiropractic care, herbal therapy, homoeopathy, and massage within the referral practices of conventional practitioners. The review also reveals midwives are more likely than obstetricians to recommend CAM, as well as a difference between the CAMs recommended by members of the different
professions. Obstetricians are more likely to refer women to use acupuncture or vitamin supplements, whilst midwives tend to endorse massage, yoga and aromatherapy. However as women often instigate their own engagement with CAM prior to discussions with maternity care providers, CAM commonly used by women in pregnancy and CAM recommended by conventional maternity care providers may differ. Whilst the nature of the referrals from maternity care providers has received little attention, recent preliminary data suggests midwives were more likely to communicate informally with CAM practitioners regarding women in their care rather than engaging in formal inter-professional communication methods (Diezel et al. 2013).

**Risks and issues with current inter-professional dynamics**

Beyond the direct effects of CAM products and treatments, safety issues may also be associated with communication with conventional care providers with regard to CAM use. In some instances this is linked to non-disclosure on the part of the woman (Harrigan 2011a) whilst in others it may be connected to the location of CAM practitioners outside of mainstream health provision and therefore insufficient communication practices between conventional and CAM providers (Steel and Adams 2012). For women consulting with both CAM and conventional care providers – which constitutes 1 in 2 Australian pregnant and birthing women (Steel et al. 2012) - their exposure to contrasting philosophies of care may result in women receiving conflicting information regarding their care options. This may lead to women making autonomous decisions about their maternity care without full consideration of all pertinent information (Lane 2008). Despite these issues there has been no known examination of the inter-professional communication patterns between CAM and conventional maternity care providers from the perspective of CAM practitioners. In response to this important knowledge gap, this paper builds on previously reported research (Diezel et al. 2013) and presents findings from a survey of CAM practitioners providing care to women during the maternity period regarding their inter-professional communication with conventional care providers.

### Table 1: Demographics and characteristics of participants (n=31)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years in practice</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>1-5 years</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>6-10 years</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>11-15 years</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>16 years or more</td>
<td>13</td>
<td>42</td>
</tr>
<tr>
<td><strong>Highest Natural Therapies Qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Diploma</td>
<td>16</td>
<td>52</td>
</tr>
<tr>
<td>Bachelor</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>PhD/Masters</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other Postgraduate</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td><strong>Clinical practice per week (hours)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 hr</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>2-10 hrs</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>11-20 hrs</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>21-30 hrs</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>31-40 hrs</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td><strong>Natural Therapies used in practice #</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massage</td>
<td>21</td>
<td>68</td>
</tr>
<tr>
<td>Naturopathy</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>Homeopathy</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Reflexology</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Traditional Chinese medicine</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Yoga</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>23</td>
</tr>
</tbody>
</table>

* seven participants did not respond to this question and as such have been excluded from any analysis involving this item
# participants were able to select more than one response for this item
Methods

Sample
The study population consisted of self-selecting participants of practicing complementary medicine practitioners at a conference organised by one of the largest CAM practitioner associations in Australia in 2012. The conference attendees were under no obligation to participate and the information provided by participants was anonymous and voluntary. All participants provided informed consent for their responses to be collated for analysis and publication.

Instrument
The survey collected a range of data including demographics such as the CAM practitioner’s highest qualification, amount of years in clinical practice, weekly practicing hours and natural therapies incorporated in their practice. The CAM practitioner’s provision of care to women seeking assistance with fertility or conception care, pregnancy-related health, birth and labour, and postnatal health were included. The rate of referrals from a conventional maternity care provider was examined, as were the participant’s approach to and experience of formal inter-professional communication with conventional care providers and other CAM practitioners, with a focus on maternity care providers known to be commonly used by pregnant women. Frequency of enquiries made to CAM practitioners about conventional approaches to maternity care was also included.

Statistical analyses
Descriptive statistics were utilised including frequencies and percentages. Analyses were conducted using the statistical software STATA 11.1.

Results
The survey was completed by 31 CAM practitioners utilising a range of CAM therapies in their practice including massage (68%), naturopathy (29%), homeopathy (19%), reflexology (19%) and Traditional Chinese medicine (19%). The majority of respondents had been in practice for 16 years or more (42%) and held an Advanced Diploma (52%) as their highest relevant qualification. Contact clinical practice hours per week varied within the group. The majority of participants practiced 2-10 hours (26%), 11-20 hours (23%) or 21-30 hours (22%) per week. It was less common for participants to practice less than 1 hour (16%) or 31-40 hours (13%) per week.

Provision of maternity-related care to women
The results show that the CAM practitioner respondents most commonly assist women with pregnancy-related health (sometimes: 39%; often: 25%), postnatal health (sometimes: 32%; often: 20%) and fertility and conception care (sometimes: 25%; often: 25%). Direct referral from other women and previous clients was the highest reported avenue for providing maternity care to women. 68% of respondents indicated that this was the main source of direct referrals over midwives, obstetricians and other CAM practitioners (n=20).

Referral patterns
The pattern of referral for women requiring pregnancy, intrapartum or postnatal care varies across different sources. Most commonly, the participants identified other women or previous clients (sometimes: 41%; often 27%), or other CAM practitioners (sometimes: 37%; often 9%) as the most common referral source for new maternity care clients. Rates of referral from midwives (sometimes: 16%; often: 8%) and obstetricians (sometimes: 4%; often: 4%) were much lower.

Formal inter-professional communication
The majority of participants reported not using or receiving formal communication methods with or from other health professionals (see table 2). The rates of formal communication were reported to be the lowest with obstetricians with a substantial number of respondents identifying as never using (78%) or receiving (92%) formal communication from this professional group. Formal communication with other CAM practitioners was identified as occurring more commonly than with any other professional group, with the highest number of respondents indicating they sometimes use (18%) or receive (17%) formal communication to/from CAM practitioners. The number of respondents reporting often using formal communication was uniform across all professional groups (4%) and this same rate was also reflected in the number of those often receiving formal communication from midwives and CAM practitioners (but not obstetricians).

Conventional management approaches
With regard to how frequently they were asked questions about conventional management approaches to pregnancy, birth and postnatal health concerns by women in their care, there was a fairly even spread of responses. A similar number of respondents identified as often (33%) being asked about conventional management approaches as those who reported never (30%) being asked.

Discussion
This study presents preliminary data which provides the first examination of reported inter-professional communication between CAM and conventional maternity care providers from the perception of CAM practitioners. In doing so, a number of key findings are highlighted.

Firstly, these findings indicate that CAM practitioners may be providing care to women across the full spectrum of maternity care stages from fertility and preconception through to postnatal health. Current available data examining the role of CAM practitioners in maternity care provision in Australia has identified a range of
antenatal conditions for which women consult with a CAM practitioner ranging from back pain and fatigue through to gestational diabetes and pre-eclampsia (Steel et al. 2012). There is also emerging evidence that women who are receiving fertility treatments may also be using CAM (Rayner et al. 2011). To date however there has been little examination of the prevalence of women’s use of CAM and, more specifically, consultation with CAM practitioners during birth or through the postpartum period. Given the potential risks associated with herbal medicine use during lactation (Mills and Bone 2005) and the absence of research examining the use of CAM during the intrapartum period (Kalder et al. 2010), this trend requires further attention. Likewise, the current training landscape available to practitioners such as naturopaths may not adequately prepare practitioners to be competent in providing care or recognising scope of practice boundaries for these complex health care situations (Steel and Adams 2012, Wardle et al. 2012).

Secondly, this study identifies the majority of referrals related to women’s health and maternity care are generated through word-of-mouth rather than through practitioner referrals. This finding is in line with previous research examining women’s use of CAM during pregnancy which identifies friends and family as the most common source of referral and information (Adams et al. 2009). Similarly, medical and allied health professionals have been found to have a less significant role in referral for pregnant and birthing women (Adams et al. 2009), a finding also supported in this study. Current trends also suggest as many as 38% of women may utilise a CAM practitioner for advice related to CAM including herbal medicines during pregnancy (Holst et al. 2009, Nordeng et al. 2011). Whilst the rate reported in our study is lower than this figure, the difference may be explained by the responses in our study relating specifically and solely to referrals, whilst the findings from previous studies may include broader interactions including seeking advice about self-prescribed CAM or the use of CAM products (as distinct from consultations with CAM practitioners).

Thirdly, the findings from our study highlight insufficient levels of inter-professional communication. Whilst this is an acknowledged issue between professional groups providing conventional maternity care (Adams 2006, Sleutel et al. 2007), the insights afforded through the results of our study suggests this is particularly amplified across the conventional-complementary medicine divide. It is unsurprising that CAM practitioners are reporting higher rates of inter-professional communication with midwives rather than obstetricians given the latter have more negative attitudes towards CAM compared with the former (Adams 2006,

Table 2: Practice and inter-professional communication patterns of participants (n=31)

<table>
<thead>
<tr>
<th>Practice and inter-professional communication patterns</th>
<th>Never (%)</th>
<th>Rarely (%)</th>
<th>Sometimes (%)</th>
<th>Often (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fertility or conception</strong></td>
<td>33</td>
<td>17</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td><strong>Pregnancy-related health</strong></td>
<td>18</td>
<td>18</td>
<td>39</td>
<td>25</td>
</tr>
<tr>
<td><strong>Birth and labour</strong></td>
<td>54</td>
<td>25</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td><strong>Postnatal health</strong></td>
<td>24</td>
<td>24</td>
<td>32</td>
<td>20</td>
</tr>
</tbody>
</table>

**How frequently do you provide care for a woman to assist with the following:**

- Fertility or conception: 33 (Never), 17 (Rarely), 25 (Sometimes), 25 (Often)
- Pregnancy-related health: 18 (Never), 18 (Rarely), 39 (Sometimes), 25 (Often)
- Birth and labour: 54 (Never), 25 (Rarely), 17 (Sometimes), 4 (Often)
- Postnatal health: 24 (Never), 24 (Rarely), 32 (Sometimes), 20 (Often)

**How frequently do you provide care to women with regard to pregnancy, birth or postnatal health due to direct referrals from the following:**

- Midwives: 68 (Never), 8 (Rarely), 16 (Sometimes), 8 (Often)
- Obstetricians: 73 (Never), 19 (Rarely), 4 (Sometimes), 4 (Often)
- Other CAM practitioners: 45 (Never), 9 (Rarely), 37 (Sometimes), 9 (Often)
- Other women/previous clients: 24 (Never), 8 (Rarely), 41 (Sometimes), 27 (Often)

**How frequently do you use formal communication (i.e. referral letters) to communicate with the following:**

- Midwives: 72 (Never), 20 (Rarely), 4 (Sometimes), 4 (Often)
- Obstetricians: 78 (Never), 18 (Rarely), 0 (Sometimes), 4 (Often)
- Other CAM practitioners: 58 (Never), 20 (Rarely), 18 (Sometimes), 4 (Often)

**How frequently do you receive formal communication (i.e. referral letters) from the following:**

- Midwives: 82 (Never), 7 (Rarely), 7 (Sometimes), 4 (Often)
- Obstetricians: 92 (Never), 8 (Rarely), 0 (Sometimes), 0 (Often)
- Other CAM practitioners: 62 (Never), 17 (Rarely), 17 (Sometimes), 4 (Often)

**How often are you asked questions about conventional management approaches to pregnancy, birth and postnatal health concerns by women in your care?**

- 30 (Never), 17 (Rarely), 20 (Sometimes), 33 (Often)
Gaffney and Smith 2004). However it is also important to note that a substantial number of participants identified as practicing naturopathy, and midwives have been reported to refer to naturopaths more frequently than obstetricians do, whilst obstetricians are described as more likely to refer to acupuncturists (Adams et al. 2009). This aside, current evidence suggests 1 in 2 pregnant women using CAM may not be disclosing their use to conventional maternity health professionals involved in their care (Harrigan 2011b). As many referrals to CAM practitioners are reported through our study to be word-of-mouth, this lack of disclosure may create a vacuum of knowledge related to CAM use during pregnancy for maternity health professionals. An implication of this outcome is a health care model which may not be affording women access to safe and appropriate care. The lack of communication from conventional maternity health professionals to CAM practitioners contributing to the care of women on the conventional care provider’s caseload creates a potential safety risk. Most obviously, women may be receiving advice or be recommended care plans which result in interactions between CAM and conventional treatments and place the mother and baby at risk. This risk is due primarily to ignorance of other adjuvant treatments being implemented by other practitioners including possible pharmacokinetic interaction between drugs and chemically-active complementary medicines (e.g. aromatherapy oils, herbal medicines, nutritional medicines) (Stargrove et al. 2008), but may also simply relate to a conflict between intended treatment outcomes for proposed care plans from the different care providers.

Finally, the absence of communication as highlighted above may not only be a symptom of negative attitudes towards CAM on behalf of conventional maternity health professionals. It may also be a result of limitations on the part of the CAM professionals themselves. Due to the nature of some CAM professions such as naturopaths defining themselves through their opposition to allopathic medicine (Wardle et al. 2013) it is possible that the attitudes and perceptions of CAM practitioners regarding their place in the current health system emphasises their separation, and in doing so does not encourage open communication with conventional care providers. Likewise, the current education of CAM practitioners such as naturopaths may not include training in inter-professional communication skills sufficient to encourage cross-modality communication even in circumstances of shared patient care (Steel and Adams 2012, Wardle et al. 2012). Alternatively, poor CAM-conventional inter-professional communication may be due to uncertainty on behalf of the conventional maternity care providers regarding the policy and legal implications of initiating communication and collaborating with CAM practitioners (Diezel et al. 2013). This may be further exacerbated by the lack of regulation of a number of CAM professions resulting in insufficient consistency in practice competencies which can create a barrier to maternity health professionals’ ability to identify competent and qualified practitioners for referral (Wardle et al. 2012, Wardle et al. 2013). It has been argued that many of these issues can be overcome through statutory regulation (Wardle et al. 2012, Wardle et al. 2013) and a quality inter-professional training programme providing shared educational experiences between both conventional and CAM practitioners (Steel and Adams 2012).

This paper presents findings which provide novel insights to a previously under-researched topic. However, limitations to the study reported here must be considered when interpreting the data. The sample size of the group and the convenience sampling method utilised may restrict the generalizability of the study. The small sample size also limits the ability for more substantive examination of the data through inferential data analysis. The self-report responses to the survey may have created a recall bias in the data. These limitations aside, this study presents a preliminary examination of the topic and the findings presented highlight some important areas which would benefit from future detailed investigation.

Conclusions

Based upon this study, there is poor inter-professional communication between CAM and conventional health professionals involved in maternity care. This scenario creates risk for women during pregnancy and birth due to possible interactions and oversights in their care. Whilst inter-professional communication needs improvement, the capacity for this may be limited by structural issues such as policy and legislative clarity for conventional care providers interacting with CAM practitioners. It may also be hindered by insufficient education of CAM practitioners, inconsistent CAM practice standards and high rates of non-disclosure by pregnant women. Due to the implications from the findings of this study, further research is necessary to help inform women, clinicians and policy makers, and support the provision of safe maternity care.

References


© National Herbalists Association of Australia 2013

continued on page 73
This is the latest study in an ongoing research project which has resulted in several papers published in peer-reviewed medical journals. In all trials, the tablets supplied were made by Integria Healthcare: a water extract of Kava (Piper methysticum) root, standardised for kava lactones. Overall, the results from all of the studies combined show that the Kava extract reduces anxiety, especially in the medically-defined generalised anxiety disorder, and has a good safety profile in terms of liver function and alertness while driving.

**Kava in the Treatment of Generalised Anxiety Disorder (GAD)**


**Trial Details**
- randomised, double-blind, placebo-controlled; 8 weeks
- dosage: 120–240 mg/day of kava lactones

**Results**
- moderate but statistically significant reduction in anxiety for the Kava group compared to placebo group
  - reduction of 7.6 points on HAMA for Kava compared to 4.2 points for placebo ($p = 0.046$)
  - anxiolytic effect was larger among those with moderate to severe GAD
  - there was significant reduction in anxiety for Kava (8.5 points, HAMA) compared to placebo (2.3 points) for those with pure GAD ($p = 0.02$)
  - at the end of the controlled phase (i.e. week 7), 26% of the Kava group were classified as remitted (HAMA score ≤ 7) compared to 6% of the placebo group ($p = 0.04$)
- specific GABA transporter polymorphisms appear to potentially modify the anxiolytic response to Kava

For more information email webmaster@mediherb.com.au
Importance of Himalayan medicinal plants and their conservation strategies

Shugufta Parveen1, Ulfat Jan2, Azra Kamili3
1 Assistant professor, Department of Botany, S.P College, Srinagar, India
2 Assistant Professor, College of Applied Medical Sciences, University of Tabuk, Saudi Arabia.
3 Professor/Director Centre of Research and Development, University of Kashmir, Srinagar, India
Corresponding author: shug_par@yahoo.co.in

Abstract: The role of medicinal plants is particularly important in the Himalayan region, as it is the major source of medication for a wide range of ailments. Therapeutic effects of medicinal plants are associated with their chemical peculiarities, which are in reality components of the defence strategies of plants. Different anthropogenic pressures viz. deforestation, habitat loss, expanding urbanization, excessive grazing and the rapidly rising demand for plant-based drugs is unfortunately creating heavy pressure on some selected high-value medicinal plant populations in the wild making them threatened or more prone to extinction. In order to reverse the trend of their extinction it is essential that a protocol for their conservation be developed to regenerate the germplasm for industrial utilisation. The potential value of medicinal compounds derived from plants is a tangible benefit of biodiversity and therefore a basis for promoting its conservation.

Introduction

Man’s dependence on plants for the essentials of his existence has been paramount since the human race began. Primitive man probably had few needs other than food and a little shelter; however, civilization has brought with it an ever increasing complexity which has increased man’s requirements to an amazing degree. The relationship between plants and humans has always been close and interdependent. Many drugs used to cure disease and relieve suffering have been sourced from plants and today almost 80% of the human population in developing countries is dependent on plant resources for health care (Farnsworth et al. 1995). The medicinal plants are the local heritage with global importance. Medicinal plants find applications in pharmaceutical, cosmetic, agriculture and food industries and the use of medicinal herbs has been documented in the history of all civilizations.

With the onset of research in medicine has been found that plants contain active principles which are responsible for the curative actions of herbal medicines. These active principles may be present in various parts of the plant viz. roots, seeds, leaves, flowers, bark and stem. The physiological effect of these active principles is used for curing ailments (Kumar 2004) and the plant is a biosynthetic laboratory for a multitude of compounds like glycosides, alkaloids and flavonoids. These compounds, responsible for the medicinal properties of the plant, are usually secondary metabolites. With the increasing awareness of the side effects of hazardous drugs and the evolution of new strains of bacteria resistant to antibiotics, the Western pharmaceutical industry is turning to the plant-based system of Indian medicine and Chinese medicine (Rajasekharan and Ganeshan 2002). The synergies between Western medicinal systems and indigenous medicinal systems have led to the increasing global importance of medicinal plants.

Over 80% of the world’s population relies on traditional plant-based medicine as per the estimate of World Health Organization (Bannerman et al. 1983). The international market for medicinal plant-based products is estimated to be US$60 billion and is growing at the rate of 7% per annum (Kamboj 2000). Niraj et al. (2002) estimated an annual compound growth rate in domestic sales of 20%. The World Health Organization (WHO) has estimated that the present demand for medicinal plants is approximately US$14 billion per year (Sharma 2004) which may touch US$5 trillion by 2050. Out of an estimated 422,000 flowering plants in the world (Govaerts 2001) more than 50,000 are used for medicinal purposes (Schippmann et al. 2002). It has been estimated that about 45,000 plant species are found in the Indian subcontinent and many of the medicinal plants from wild areas, due to overexploitation, have become rare (Rheum emodi, Aconitum), threatened (Rauvolfia serpentine, Berberis aristata) or endangered (Sassurea lappa, Dioscorea deltoidea) (Chatterjee 2002). Ethnomedicine is a promising field of research, especially in Western Himalaya as it harbours a variety of medicinal and aromatic plants. The important vascular plants used in commercial ethno-medicine in Western Himalaya are presented in Table 1.1

Since the advancement in the field of ethnobotany, the importance of the traditional ethnobotanical knowledge has been fully realised. Therefore, most of these plants are now recognised by the Indian system of medicine. Although little is known about the biochemical specificities of Himalayan medicinal plants, some
evidence suggests that such plants offer great potential for the discovery of novel molecules and new sources of active compounds, often because of the environmental stress to which they are subjected. Jackson and Dewick (1984), for example, found that the content of podophyllotoxin, which is isolated from podophyllin (a resin produced by species of the genus Podophyllum, commonly known as ‘may-apple’), is much higher (4.3% of dry weight) in the Himalayan species Podophyllum hexandrum than in the American species P. peltatum (0.25%). Similarly, Bos et al. (1997) reported that the patchouli alcohol, and b- and g-patchoulene, which are characteristic of the essential oil of Himalayan valerian, Valeriana wallchii (Valerianaceae), have not been described to be present in other species, such as V. officinalis. Concentrations of active phytochemical constituents of some Himalayan medicinal plant species have been reported to be high in populations growing at higher altitude as compared to the populations growing at the lower altitude (Mikage et al. 1987, Yang et al. 2005a). In mountains, plant secondary compounds exhibit patterns of variation in relation to stress associated with elevation which relates to plant competition for resources, defence strategies against herbivores and pathogens, and the harsh climate. Factors such as soil type, temperature, precipitation and abundance of microbial populations also have greater effect on the synthesis and turnover of secondary compounds in medicinal plants (Mikage and Mouri 2000, Yang et al. 2005a,b).

Financially, the retail sale of pharmaceutical products was estimated at US$80-90 billion globally in 1997, with medicinal plants contributing very significantly (Sheldon, Balick and Laird 1997). A study of the 25 best-selling pharmaceutical drugs in 1997 found that 11 of them (42%) were either biological natural products or entities derived from natural products, with a total value of US$17.5 billion (Laird and ten Kate 2002). The total sales’ value of drugs (such as Taxol) derived from just one plant species (Taxus baccata) was US$2.3 billion in 2000 (Laird and Kate 2002). The world market for herbal remedies in 1999 was calculated to be worth US$19.4 billion, with Europe in the lead (US$6.7 billion), followed by Asia (US$5.1 billion), North America (US$4.0 billion), Japan (US$2.2 billion) and then the rest of the world (US$1.4 billion) (Laird and Pierce 2002).

Nowadays, due to increasing awareness of herbal products, there is tremendous pressure on Himalayan medicinal plants. The flora has been exposed to increasing anthropogenic pressures involving deforestation, habitat loss, expanding urbanisation, excessive grazing, encroachment and eutrophication of water bodies and overexploitation of economically important plants. As a result of this a large number of plant species are threatened; some having become vulnerable or dangerously rare. The primary threats to medicinal plants are those that affect any kind of biodiversity used by humans (Rao et al. 2004). The escalating demand of medicinal plants has led to the overharvesting of many plants in the wild, which subsequently results in loss of their existing populations. For example, the large quantity of Himalayan Yew (Taxus baccata) which has been gathered from wild since its extract, taxol, was established as a treatment for ovarian cancer. Aconitum heterophyllum, Nardostachys grandiflora, Dactylorhiza hatagirea, Polygonatum verticillatum, Gloriosa superba, Arnebia benthamii and Megacarpoea polyandra are other examples of North Indian medicinal plant species which have been overexploited for therapeutic uses and have subsequently been placed today in rare and endangered categories. Many medicinal plant species are used in curing more than one disease (Kala 2005) and as a result, these species are under pressure due to over-collection from the wild.

Many declining species of medicinal herbs are added to the threatened or endangered plant lists each year. A wild-harvester can easily wipe out an entire population of a species in an area in a short period of time. In the Red Data Book of IUCN 215 threatened taxa native to India are mentioned. About 121 plant species of Himalayan region have also been recorded in it. Using Red Data Book criteria of International Union of Conservation of Nature and Natural resources (IUCN) the threatened medicinal plants have been categorized as vulnerable, critically rare and endangered (Samant et al. 1998) under the Biodiversity Conservation Prioritization Project (BCPP). The ongoing growing recognition of medicinal plants is due to the fact that although allopathic medicine may cure a wide range of diseases, its high price and side-effects are causing many people to return to herbal medicines which have fewer side-effects (Kala 2005). Therefore, there is an urgent need to develop cultivation and conservation practices for medicinal plants.

**Strategies for conservation of medicinal plants**

The formation of Natural Heritage Conservation Councils (NHCCs) has been promoted which encourage people to seek out and conserve sites of special importance for medicinal plants – conserve sites of special importance. In some cases these community reserves are protected through social or physical fencing, or the engagement of caretakers. Farmers have been encouraged to grow medicinal plants and medicinal plant growers cooperatives have been formed to help with marketing.

The paucity of information is particularly acute in the Himalaya, where only a few species have been studied from biological or ecological perspectives (Ghimire et al. 2005). Most of the research conducted so far is related either to the identification of major species or their use in healthcare and trade. Many types of action can be taken in favour of the conservation and sustainable use of medicinal plants. Some of these
Table 1.1 Important medicinal plants of Western Himalaya (Dar et al. 2002).

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Therapeutic use</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Achillea millefolium</em> Linn.</td>
<td>Diaphoretic, stimulant and tonic</td>
</tr>
<tr>
<td><em>Aesculus indica</em> Celebr. Ex Camb.</td>
<td>Fruit cathartic</td>
</tr>
<tr>
<td><em>Ajuga bracteosa</em> Wall. Ex Benth</td>
<td>Shoot extract diuretic</td>
</tr>
<tr>
<td><em>Allium atropurpureum</em> Waldst. &amp; kit</td>
<td>Bulbs stimulant, expectorant</td>
</tr>
<tr>
<td><em>Angelica archangelica</em> Linn.</td>
<td>Tonic, antispasmodic, carminative and stimulant</td>
</tr>
<tr>
<td><em>Arctium lappa</em> Linn.</td>
<td>Roots diuretic and diaphoretic</td>
</tr>
<tr>
<td><em>Arisaema jacquemontii</em> Blume</td>
<td>Curative in respiratory problems, tubers insecticidal</td>
</tr>
<tr>
<td><em>Arnebia benthamii</em> (Wall. ex G.Don) I.M. Johnston</td>
<td>Shoot extract curative in tongue and throat diseases, fever; also good for heart</td>
</tr>
<tr>
<td><em>Artemisia absinthium</em> Linn.</td>
<td>Leaves and flowering tops anthelmintic and expectorant</td>
</tr>
<tr>
<td><em>Asparagus filicinus</em> Buch. Huleon-Ham. ex D.Don</td>
<td>Seed paste used in rheumatism</td>
</tr>
<tr>
<td><em>Astragalus grahamianus</em> Royle</td>
<td>Root used a tooth-brush to relieve toothache.</td>
</tr>
<tr>
<td><em>Atropa acuminata</em> Royle ex Lindley</td>
<td>Root and leaves narcotic, sedative, diuretic</td>
</tr>
<tr>
<td><em>Bergenia ciliata</em> (Haw.) Sternb.</td>
<td>Decoction of rhizome diuretic, taken for ulcer.</td>
</tr>
<tr>
<td><em>Bunium persicum</em> (Boiss.) Fedts.</td>
<td>Tubers diuretic</td>
</tr>
<tr>
<td><em>Celosia argentea</em></td>
<td>Seeds used as demulcent</td>
</tr>
<tr>
<td><em>Centaurea iberica</em> Trev. ex Spreng.</td>
<td>Flower head curative on eczema</td>
</tr>
<tr>
<td><em>Chenopodium botrys</em> Linn.</td>
<td>Expectorant</td>
</tr>
<tr>
<td><em>Colchicum luteum</em> Baker</td>
<td>Corms yielding colchicines; used in rheumatism</td>
</tr>
<tr>
<td><em>Conium maculatum</em> Linn.</td>
<td>Fruits anodyne, sedative, antispasmodic</td>
</tr>
<tr>
<td><em>Cotula anthemoides</em> Linn.</td>
<td>Stomachic, used in rheumatism and bathing ladies after delivery</td>
</tr>
<tr>
<td><em>Crataegus songarica</em> Regel</td>
<td>Fruit extract good for heart</td>
</tr>
<tr>
<td><em>Cuscuta capitata</em> Roxb.</td>
<td>Laxative used in swollen tonsillitis and chest pain</td>
</tr>
<tr>
<td><em>Dactylorhiza hatagirea</em> (D.Don) Soo</td>
<td>Tubers used in backache</td>
</tr>
<tr>
<td><em>Daphne mucronata</em> Royle</td>
<td>Roots purgative, bark and leaves used cutaneously</td>
</tr>
<tr>
<td><em>Datura stramonium</em> Linn.</td>
<td>Leaves and seeds useful in bronchitis/asthma, antispasmodic and narcotic</td>
</tr>
<tr>
<td><em>Digitalis purpurea</em> Linn.</td>
<td>Rich source of digitoxin, curative in heart diseases</td>
</tr>
<tr>
<td><em>Dioscorea deltoidea</em> Wall.</td>
<td>Tubers rich in diosgenin and yield cortisone, a steroid hormone</td>
</tr>
<tr>
<td><em>Dipsacus inermis</em> Wall.</td>
<td>Leaf decoction used by women for bathing after delivery</td>
</tr>
<tr>
<td><em>Ephedra gerardiana</em> Wall.</td>
<td>Yields ephedrine, used in asthma</td>
</tr>
<tr>
<td><em>Euphorbia hispida</em> Boiss.</td>
<td>Believed to be used in leprosy</td>
</tr>
<tr>
<td><em>Ferula jaeschkeana</em> Vatke</td>
<td>Yields a gum resin, used in wounds and bruises</td>
</tr>
<tr>
<td><em>Ficus carica</em> Linn.</td>
<td>Latex from leaves and twigs used in skin disease</td>
</tr>
<tr>
<td><em>Foeniculum vulgare</em> Mill.</td>
<td>Leaves diuretic, roots purgative, seeds aromatic</td>
</tr>
<tr>
<td><em>Fritillaria roylei</em> Hook.</td>
<td>Bulbs used medicinally</td>
</tr>
<tr>
<td><em>Fumaria indica</em> (Haussk.)</td>
<td>Extract taken as cooling “sharbat”(drink)</td>
</tr>
<tr>
<td><em>Gentiana kurroo</em> Royle</td>
<td>Curative in stomach complaints</td>
</tr>
<tr>
<td><em>G. tianschanica</em> Rupr.ex Kusn.</td>
<td>Rhizome improves appetite by stimulating gastric secretions</td>
</tr>
<tr>
<td><em>Geranium wallachianum</em> D.Don ex Sweet</td>
<td>Astringent, used in toothache and applied externally to eyes</td>
</tr>
<tr>
<td><em>Heracleum candicans</em> Wall.</td>
<td>Aphrodisiac and nerve tonic</td>
</tr>
<tr>
<td><em>Hyoscyamus niger</em> Linn.</td>
<td>Leaves and seeds sedative, narcotic, used in whooping cough and asthma</td>
</tr>
<tr>
<td><em>Iris nepalensis</em> Wall.</td>
<td>Rhizome stimulant, expectorant</td>
</tr>
<tr>
<td><em>Isodon rugosus</em> (Wall.) Codd</td>
<td>Extract of leafy twigs used as an eye wash</td>
</tr>
<tr>
<td><em>Juniperus communis</em> Linn.</td>
<td>Fruit diuretic, carminative and stimulant</td>
</tr>
<tr>
<td><em>Jurinea macrocephala</em></td>
<td>Rhizome decoction good for heart, source of dhup (a crystal used for ritual)</td>
</tr>
<tr>
<td><em>Lavatera cashmiriana</em> Cambess.</td>
<td>Seeds antiseptic</td>
</tr>
<tr>
<td><em>Lycnis coronaria</em> (Linn) Desr.</td>
<td>Root decoction used in lung and liver complaints</td>
</tr>
<tr>
<td><em>Malva neglecta</em> Wall</td>
<td>Laxative, expectorant</td>
</tr>
<tr>
<td><em>Marrubium vulgare</em> Linn.</td>
<td>Leaf paste applied to boils and in rheumatism</td>
</tr>
<tr>
<td><em>Mentha piperita</em> Linn.</td>
<td>Leaf infusion used in indigestion and rheumatic pains</td>
</tr>
</tbody>
</table>
are undertaken directly at the places where the plants are found, while others are less ‘direct’, such as those relating to commercial systems, ex situ conservation and bio-prospecting. Progress is hampered at present by a shortage of good quality information available in forms that can easily be used by relevant parties. Probably the single most important ‘role’ for medicinal plants in biological and ecological conservation stems from the foundations that they can provide for the involvement of people in conservation of natural habitats (Schopp-Guth and Fremuth 2001). In other words, the significance of medicinal plants to people can be sufficiently great that arrangements made for the conservation and sustainable use of medicinal plants can lay important foundations for the conservation of natural habitats and ecological services more generally. The conservation of threatened medicinal plants serves to focus on the need to conserve their wider natural habitats as well.

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Traditional Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Nepeta cataria</em> Linn.</td>
<td>Leaf decoction curative in dysentery, leaves chewed in toothache</td>
</tr>
<tr>
<td><em>Nympha alba</em> Linn.</td>
<td>Leaves and flowers antiperiodic</td>
</tr>
<tr>
<td><em>Origanum normale</em> D.Don</td>
<td>Leaf powder used to cure wounds</td>
</tr>
<tr>
<td><em>Poenia emodi</em> wall ex Royle</td>
<td>Tubers seeds and flowers used medicinally</td>
</tr>
<tr>
<td><em>Papaver macrostomum</em> Bloss. &amp; Huet. ex Bois.</td>
<td>Used as cardiac tonic</td>
</tr>
<tr>
<td><em>Peganum harmala</em> Linn.</td>
<td>Used in rheumatism and colds, also to avert evil eye</td>
</tr>
<tr>
<td><em>Phytolacca acinosa</em> Roxb.</td>
<td>Has narcotic properties</td>
</tr>
<tr>
<td><em>Picrorhiza kurrooa</em> Royle ex Benth</td>
<td>Root antiperiodic, stimulates gastric secretion</td>
</tr>
<tr>
<td><em>Plantago lanceolata</em> Linn.</td>
<td>Taken as cooling drink</td>
</tr>
<tr>
<td><em>Podophyllum hexandrum</em> Royle</td>
<td>Rhizome yields podophyllin used to check cancerous growth</td>
</tr>
<tr>
<td><em>Polygonum alpinum</em> All.</td>
<td>Roots astringent</td>
</tr>
<tr>
<td><em>P. amplexicaule</em> D.Don</td>
<td>Roots astringent, used in menorrhagia</td>
</tr>
<tr>
<td><em>Portulaca oleracea</em> Linn.</td>
<td>Styptic internally, seeds as vermifuge</td>
</tr>
<tr>
<td><em>Prunella vulgaris</em> Linn.</td>
<td>Decoction of flowers antineuraligic</td>
</tr>
<tr>
<td><em>Rheum webbianum</em> Royle</td>
<td>Rhizome pungtive, astringent and tonic</td>
</tr>
<tr>
<td><em>Rhus succedanea</em> Linn.</td>
<td>Plant used medicinally</td>
</tr>
<tr>
<td><em>Rosa webbiana</em> Wall.ex Royle</td>
<td>Paste of petals curative in chest infections</td>
</tr>
<tr>
<td><em>Rhododendron campanulatum</em> D.Don</td>
<td>Leaf and flower powder used as snuff in headaches</td>
</tr>
<tr>
<td><em>Rumex patientia</em> Linn.</td>
<td>Roots and leaves purgative</td>
</tr>
<tr>
<td><em>Salix alba</em> Linn.</td>
<td>Aspirin was first extracted from its leaves and bark</td>
</tr>
<tr>
<td><em>Salvia moorcroftiana</em> Wall. ex. Benth</td>
<td>Roots given in colds and coughs; seeds emetic, curative in haemorrhoids; leaf paste applied to boils.</td>
</tr>
<tr>
<td><em>Smilax vaginata</em> Decne.</td>
<td>Roots used medicinally</td>
</tr>
<tr>
<td><em>Solanum nigrum</em> Linn.</td>
<td>Stomachic, promotes urination; fruit used as tonic and laxative</td>
</tr>
<tr>
<td><em>Taraxacum officinum</em> Wigg.</td>
<td>Expectorant, leaf decoction fed to convalescent mothers after delivery</td>
</tr>
<tr>
<td><em>Taxus wallichiana</em> Zucc.</td>
<td>Bark/shoots yield taxol, used in treating cancerous growth</td>
</tr>
<tr>
<td><em>Thymus linearis</em> Benth. ex Benth.</td>
<td>Used in weak vision, complaints of stomach, chest and liver also for suppression of urine and menstruation</td>
</tr>
<tr>
<td><em>Tribulus terrestris</em> Linn.</td>
<td>Fruit diuretic, root extract used as purgative</td>
</tr>
<tr>
<td><em>Tulipa stellata</em> Hook. f.</td>
<td>Extract of bulbs used as tonic</td>
</tr>
<tr>
<td><em>Urtica dioca</em> Linn.</td>
<td>Extract of young leaves and inflorescence diuretic and stomachic.</td>
</tr>
<tr>
<td><em>Valeriana jatamansii</em> Jones</td>
<td>Roots as tonic, stimulant and antispasmodic; also used in epilepsy and hysteria</td>
</tr>
<tr>
<td><em>Verbascum thapsus</em> Linn.</td>
<td>Applied locally to cure burns, leaves used in smoking</td>
</tr>
<tr>
<td><em>Viola indica</em> W. Becker</td>
<td>Plant antipyretic</td>
</tr>
<tr>
<td><em>Viola odorata</em> Linn.</td>
<td>Flowers emollient, demulcent used in lung trouble</td>
</tr>
<tr>
<td><em>Ziziphus jujuba</em> Linn.</td>
<td>Fruit styptic, blood purifier and stomachic</td>
</tr>
</tbody>
</table>

Keeping in view the importance of medicinal plants and the threats to them, there is an urgent need to develop cultivation practices for the conservation and commercial production of medicinal plants. There are two main approaches to conserve biodiversity, namely in situ and ex situ, conservation. Of the different conservation and large scale multiplication techniques presently being employed, tissue culture can prove to be a very useful tool as a large number of pathogen free plants can be produced in less time and help to conserve the germplasm of rare and endangered species. Therefore, there is no need to destroy the stock plant in order to cultivate it, which is an important consideration when endangered and threatened herbs are being cultivated for consumer demand. Propagation through tissue culture can provide a solution for mass propagation of plants in general and threatened plants in particular.
Conclusion

Several themes consistently arise in the various sets of recommendations that have been compiled relating to the conservation of medicinal plants, such as those associated with international conferences at Chiang Mai, Thailand in 1988 and Bangalore, India in 1998 (Akerere et al 1991, Bodeker 2002). They include: the need for co-ordinated conservation action based on both in situ and ex situ strategies; inclusion of community and gender perspectives in the development of policies and programmes; the need for more information on the medicinal plant trade; the establishment of systems for inventorying and monitoring the status of stocks of medicinal plants; the development of sustainable harvesting practices and the development of commercial propagation and cultivation techniques. Because so many species of plants are medicinal, medicinal plant conservation is, in some ways, a microcosm of plant conservation as a whole.

References

**Eosinophilic oesophagitis (EoE): hypothetical herbal interventions for a rare and emerging gastrointestinal disorder**

Nicole Hannan  BSc (Sports Med)  
Surfers Paradise, QLD  
Email: info@alchemyhealth.com.au

**Abstract:** Eosinophilic oesophagitis (EoE) is a chronic antigen-driven inflammatory disease characterised histologically by high levels of eosinophils in the oesophagus and clinically by oesophageal dysfunction and gastrointestinal symptoms. The cause of EoE is still unknown; however the emerging evidence of mechanisms involved is revealing the complex nature of the disease. None of the current pharmaceutical treatments are specifically indicated for EoE. Presently, there have been no clinical trials investigating herbal interventions and we hypothesise that some of the physiological actions of Scutellaria baicalensis, Fritillaria cirrhosa bulbus, Anemarrhena rhizoma, Lee-Mo-Tang (traditional Korean formula), Glycyrrhiza glabra, Withania somnifera, Curcuma longa, Althaea officinalis, Hydrastis canadensis, Albizia lebbeck and Hemidesmus indicus may be of benefit based on the known pathogenesis of the disease. Long-term use of the currently recommended pharmaceutical interventions can result in unwanted side effects, which may possibly be reduced by the use of herbal medicines. As the precise aetiology of EoE is still unknown, there may be scope for additional herbs that have appropriate actions in the prevention or treatment of EoE. Given the rapidly increasing prevalence of EoE in recent years, herbal research in this field would be recommended.

**Introduction**

EoE was first described in the early 1990’s, with incidence increasing rapidly in recent years in westernised countries (Hruz 2011). Prevalence is often reported to be 1-4 in 10,000 (.01 - .04%). Some data, however, indicates that in westernised countries prevalence may be as high as between 0.5% and 1.1% of the population and increasing (Enns 2010, Hruz 2011). This discrepancy may be linked to a poor understanding of the condition by health professionals resulting in misdiagnosis and consequent under-reporting (Doherty 2001). Occurrence is far more prominent in males and atopic patients. All age groups are affected but clinical manifestations can differ. Infants present with reflux, vomiting, food refusal, failure to thrive and signs of epigastric pain; children suffer reflux, heartburn, vomiting, abdominal pain and dysphagia, while adolescents and adults primarily present with food impaction and dysphagia (Straumann 2012). A common initial indicator of EoE in children is gastro-oesophageal reflux disease (GORD) that does not respond to proton pump inhibitor (PPI) therapy (Lucendo 2010). Diagnosis of EoE is determined only by symptoms of oesophageal dysfunction in conjunction with positive oesophageal biopsies (a minimum of 15-24 eosinophils per high-power field), as individually either could be indicative of other disease processes (Enns 2010). Distribution of eosinophils in the oesophagus is not uniform. A 1cm difference in biopsy site can result in either a diagnosis of severe EoE or no diagnosis at all therefore multiple biopsies at multiple sites are crucial (Valent 2012). Given the rapid increase in prevalence and lack of knowledge surrounding the aetiology of EoE, the need for research into non-pharmaceutical interventions is increasing.

**Pathogenesis**

The cause of EoE in humans is still unknown but the emerging evidence of mechanisms involved is revealing the complex nature of the disease. Although dietary and environmental allergens are implicated, recent research indicates that a clinical spectrum of different forms of inflammation evolve from various allergens, making the pathophysiology of EoE unique in each patient (Lucendo 2010). Active inflammation of the oesophageal mucosa is most commonly seen in children, with tissue remodelling occurring over time resulting in furrowing, corrugation and strictures (Straumann 2012). The antigen-driven hypersensitivity response seen in EoE involves multiple immunoglobulin E (IgE)-dependent delayed reactions and inflammatory pathways, affecting numerous cells, molecules and genes. Cellular changes are also prevalent, including basal zone hyperplasia, elongated vascular papillae and oesophageal mucosa infiltration (Mulder 2011).

**Known mechanisms of disease in EoE**

Eosinophils are regulated by the cytokine interleukin (IL)-5 and survive in tissue for approximately 2–14 days. IL-4 and IL-13 are mediators in the recruitment of eosinophils from blood to tissue, as their presence causes the secretion of chemo-attractant and pro-inflammatory cytokines including eotaxin proteins (chemokines) and leukotriene B₄. They then recruit eosinophils into oesophageal tissue via integrin-mediated migration.
Antigen exposure, cytokines and other inflammatory mediators activate eosinophils and lead to the release of reactive oxygen species (ROS), arachidonic acid metabolites, tumour necrosis factor-α (TNF-α), additional cytokines (interleukins, chemokines, interferons and growth factors) and protein mediators such as major basic protein, eosinophil-derived neurotoxin, eosinophil peroxidase and eosinophil cationic protein (Busse 2010). Recent evidence suggests that EoE eosinophils might also act as antigen-presenting cells (APCs) leading to activation of T cells, initiating the cytokine cascade (Le-Carlson 2013).

Studies on EoE patients have revealed elevated mast cell numbers in intra-epithelial tissue and defined a link between mast cells, Transforming Growth Factor beta (TGF-β), and smooth muscle (Aceves 2010). Immunoglobulin E (IgE) binds to the high affinity receptor located on the mast cell surface where antigen exposure subsequently causes mast cell activation and degranulation. Degranulation of mast cells results in the release of eosinophil attractants histamine and eicosanoids, perpetuating the inflammatory cycle and causing further oesophageal tissue damage (Mulder 2011). In EoE patients high levels of mast cells are found not only in the superficial tissue but also in the deeper smooth muscle layer of the oesophagus, indicating the high likelihood of mast cell involvement in the pathogenesis of the disease (Abonia 2010).

B-lymphocytes are reliant on T-helper 2 (Th2) cells and are responsible for secretion of IgE (Mulder 2011). Increased levels of B-lymphocytes are found in the epithelial tissue and vascular papillae in EoE indicating a possible role in pathogenesis. On the other hand, elevated B-lymphocytes have been shown to correlate more to mast cell presence than eosinophils (Vicario 2010, Mulder 2011). Increased T cells, CD3+, CD4+ and CD8+ cells are present in the oesophageal mucosa of EoE patients, with Th2, IL-5 responses seen to be due to either food allergy or EoE. Increased numbers of proximal oesophageal CD1a+ cells have been associated with EoE in children (Mulder 2011). EoE appears to be a Th2 associated disease and imbalances of T regulatory cells may be a contributing factor in pathogenesis (Vicario 2010).

TGF-β1 is expressed by eosinophils and mast cells and is potentially a central molecular mediator of EoE (Mulder 2011). It is found in higher numbers in EoE patients and is associated with allergic inflammation and direct regulation of pro-fibrotic processes. This leads to eotaxin-3-mediated eosinophil recruitment and adhesion, along with tissue remodelling thought to be involved in the chronic fibrosis and acute smooth muscle contraction associated with dysphagia (Abonia 2010).

Current recommended treatment options for EoE

Despite numerous pharmaceutical trials, no cure has been found and none of the drugs used are specifically indicated for EoE. The current recommended treatment options involve removal of allergic triggers, controlling inflammation and modifying structural oesophageal dysfunction via hypoallergenic diets (elimination diet, dietary restriction and elemental formulas), topical corticosteroids, mast-cell stabilisers, leukotriene inhibitors and oesophageal dilation (Lucendo 2010). This paper will examine the research and traditional evidence of herbal medicine to identify hypothetical herbal medicine treatments for reducing inflammation and pain in EoE patients.

Methodology

Literature search

Searches of PUBMED, Google Scholar, EBSCO Host, Alt Health Watch, Science Direct and Academic One File databases were conducted in September 2012. Two traditional texts were used: A Modern Herbal (Grieve 1931) for its documenting of traditional English applications for herbal medicine, and the King’s American Dispensatory (Felter 1898) for traditional American applications for herbal medicine. Although clinical trials related to herbal interventions in EoE were not found, articles that may be of benefit for the treatment of inflammation and pain caused by EoE inflammatory mediators were extracted and reviewed.

Search Terms

Search terms for this review were defined based on the condition itself and the herbs that are described as anti-allergic, anti-inflammatory and demulcent in common clinical herbal medicine texts as well as those that are often indicated in inflammatory gastrointestinal conditions (Bone 2003): “eosinophil”; “eosinophilic oesophagitis”; “herbal”; “inflammation”; “baical skullcap”; “Scutellaria baicalensis”; “licorice”; “Glycyrrhiza glabra”; “Withania somnifera”; “turmeric”; “Curcuma longa”; “marshmallow”; “Althaea officinalis”; “golden seal” “Hydrastis canadensis”; “Albizia lebbeck” and “Hemidesmus indicus”.

Possible herbal interventions for EoE

Although the prevalence of EoE is rapidly increasing, there remains a lack of safe and effective long-term treatments. The use of swallowed topical steroids is not recommended for prolonged periods and has been shown to result in oesophageal candidiasis in 15% of patients, little or no improvement in 40% of patients with identifiable allergies, and recurrence of symptoms in 45% of patients within 12 months following withdrawal of the drug (Nurko 2006). Elimination diets can result in poor compliance and be severely restrictive, with some patients exclusively requiring amino acid–based elemental formulas administered orally or via enteral feeding. Reintroduction of restricted foods results in recurrence of symptoms and inflammation (Straumann
Dilation therapy is an invasive treatment for functional narrowing of the oesophagus that has no impact on the underlying inflammation. It is performed under general anaesthetic and comes with the serious risk of oesophageal perforation (Lucendo 2010). These factors demonstrate the inadequacy of the currently recommended treatment options due to lack of long-term efficacy, poor compliance and safety issues, and they indicate the need for more research into other treatments such as the use of herbal medicine in EoE.

Topical steroid application has been found more effective than nebulised steroid therapy in EoE (Peterson 2010); therefore, clinical trials into herbal administration in liquid form may be preferable to ensure direct contact with oesophageal mucosa. As inflammation and oesophageal tissue damage is prevalent in EoE patients, research into the use of herbal glyctacts (alcohol removed) may be preferable over ethanolic extracts. Although there appear to be no clinical trials related to herbal interventions in EoE, the following review discusses some potentially beneficial herbs based on the physiological actions of the herbs and the pathogenesis and symptoms of EoE.

Scutellaria baicalensis

The medicinal qualities of S. baicalensis, also known as Huang qin, were first discussed in the ancient Chinese medical text Shen-nung pen ts‘ao ching (Divine Husbandman’s Materia Medica), where it was said to clear heat and dry dampness in the stomach and intestines (Bensky 2004). The roots of S. baicalensis contain up to 20% flavones, including the lipophilic antioxidant compounds baicain, baicalsine, wogonoside and wogonin (Matkowski 2008). Numerous studies have detailed the mechanisms involved in the anti-inflammatory and anti-allergic actions of S. baicalensis.

S. baicalensis has demonstrated anti-inflammatory activity in vitro. Human mast cells stimulated with either IL-1β (10 ng/ml) or TNF-α (100 U/ml), then administered baicalein (1.8 to 30µM) resulted in significantly inhibited production of many (EoE related) inflammatory cytokines, and stabilised mast cells via regulation of the NF-Kb pathway (Hsieh 2007). Another in vitro study demonstrated that baicalin brought about significant reductions in neutrophil infiltration and selectively bound to chemokine ligands, interfering with their ability to induce cell migration and resulting in an anti-inflammatory action (Li 2000). The possible use of S. baicalensis in EoE is further supported with findings that baikalin inhibited T-cell proliferation by 98% and reduced production of multiple pro-inflammatory cytokines, including TNF-α, in human peripheral blood mononuclear cells (Krakauer 2001). Further to this, in vitro evidence has shown that at a concentration of 10 µg/ml, a S. baicalensis extract containing baikalein, oroxylin A, baikalin and skullcap flavone II, inhibited the production of eosinophil-specific chemokine eotaxin in (IL-4 and TNF-α-stimulated) human fibroblasts. Effects were dose-dependent with approximately 50% inhibition observed with administration of a 1.8 µg/ml dose (Nakajima 2001).

Baicain and baikalein reduce inflammation and oxidative stress by significantly impairing the production of ROS and preventing leukocyte adhesion while baikalein also has the ability to metabolize hydrogen peroxide (Shen 2003, Matkowski 2008).

Wogonin inhibits nitric oxide (NO) synthase and exhibits a concentration-dependent inhibition of lipopolysaccharide-induced prostaglandin E2 (PGE2) production in murine macrophages. As little as 0.5 µg/ml concentration of wogonin can result in a decrease of cyclooxygenase-2 (COX-2), and COX-2 protein expression is depressed at concentrations of 10 µg/ml and over (Wakabayashi 2000). S. baicalensis has been shown to inhibit the arachidonic acid cascade via the 5-lipoxygenase (5-LOX) pathway, subsequently inhibiting EoE inflammatory mediators leukotrienes (Kimura 1987). Further, in vitro and in vivo evidence demonstrates that S. baicalensis acts on mast cells, with oral administration of S. baicalensis extract in rats resulting in significantly reduced histamine release, while human mast cells treated with various concentrations of S. baicalensis extract (1, 10, and 100 µg/ml) significantly inhibited the mitogen-activated protein (MAP) kinase pathway and production of IL-8 and TNF-α. Inhibition of the MAP kinase pathway reduces the expression of EoE related inflammatory cytokines (Jung 2012).

The anxiolytic action of S. baicalensis is attributed to its ability to bind with the benzodiazepine site of the gamma amino butyric acid (GABA)-A receptor (Liao 2003). This may be of benefit as increased levels of anxiety have been found in children suffering from EoE (Klennert 2009).

Fritillaria cirrhosa bulbous, Anemarrhena rhizoma and Lee-Mo-Tang

The traditional Korean herbs Fritillaria cirrhosa bulbous, Anemarrhena rhizoma and Lee-Mo-Tang (a traditional herbal formulae composed by a ratio of 50 to 50), have been shown in vivo to significantly reduce inflammation via lowered levels of numerous EoE inflammatory mediators. Eosinophil, histamine, IgE and Th2 cytokine (IL-4, IL-5 and IL-13) levels were all significantly reduced and increases in interferon-γ production were observed when eosinophilia-induced mice were orally administered 200mg/kg of each herb three times a week for 8 weeks (Yeum 2007).

Glycyrrhiza glabra

G. glabra is a herb with anti-inflammatory, mucoprotective and demulcent actions. Traditionally G. glabra root has been used as an emollient, demulcent and nutritive due to its ability to reduce mucosal irritation and relieve intestinal pain (Felter 1898, Grieeve 1931). Its gastro-protective effects are due to an increase in mucous secretion from elevated prostaglandin levels.

© National Herbalists Association of Australia 2013
This action may be beneficial in EoE by soothing and protecting damaged and inflamed gastrointestinal mucosa (Baker 1994). G. glabra has steroid-like anti-inflammatory effects, possibly reducing the need for corticosteroid medication in EoE; however, its long-term use is not recommended as it has been known to cause hypertension, hypokalemia and quadriparesis when used in high doses for prolonged periods (Omar 2012).

**Withania somnifera**

Many of the physiological actions of *W. somnifera*, such as its adaptogenic and anti-inflammatory properties, may theoretically be of benefit in the treatment of EoE. *W. somnifera* has also been shown to decrease immunosuppression and regulate corticosteroid levels, while also acting as an immune modulator and anxiolytic (Bhattacharya 2003, Davis 2000, Gutpa 2007).

*W. somnifera* has demonstrated anti-inflammatory, immune modulating and eosophil lowering activity in vivo and in vitro. The active constituent withanolides are anti-inflammatory via inhibition of COX enzymes. *W. somnifera* root extract (500 µg/ml in vitro) significantly inhibited lipid peroxidation and demonstrated NO and hydrogen peroxide scavenging activity when administered to inflammatory bowel disease (IBD) induced rats, and at a concentration of 1000mg/kg a significant mucost-restoretive effect was seen (Pawar 2011). An additional in vivo study in an asthma-induced mouse model resulted in immune modulating, eosinophil lowering and anti-inflammatory actions comparable to corticosteroid medication, attributed to phytoestrogen withaferin A (Oberholzer 2008). Further in vivo trials in stress-induced mice that were administered *W. somnifera* daily at graded doses of 0.25, 0.5, 1 and 2 mg/kg led to improvements in altered T-lymphocyte subset distribution and cytokine secretion patterns, demonstrating its effectiveness as an anti-inflammatory agent and possible therapeutic benefit in EoE (Kour 2009). *W. somnifera* may also play a role in the treatment of IgE mediated reactions as it has been shown to down-regulate OVA-specific IgE antibody and antigen-specific IgE antibody responses in mice, indicating its possible effectiveness in an antigen driven disease such as EoE (Amara 1999).

**Curcuma longa**

*C. longa* is a potent antioxidant via direct scavenging of free radicals and its ability to enhance the activity of certain endogenous antioxidants such as glutathione peroxidase ( Fiorillo 2008). It causes inhibition of inflammatory prostaglandin PGE2 via PGE2 synthase-1 enzyme and stimulates nuclear transcription molecule Nrf2, enhancing cell antioxidant defences and reducing inflammation (Oksman 2006). *C. longa* inhibits NF-xB, COX and LOX, decreasing the breakdown of arachidonic acid into the EoE inflammatory mediators, leukotrienes, prostaglandins, and prostacyclins (Blaylock 2012). In vivo evidence showed that an oral dose of 550 mg of curcumin twice daily for one month and then for an additional month three times daily resulted in significantly reduced inflammatory indicators (erythrocyte sedimentation rate and c-reactive protein) in patients with ulcerative colitis, a disease which shares many of the inflammatory mediators seen in EoE (Jurenka 2009).

**Althaea officinalis**

Although clinical trials are lacking, *A. officinalis* has traditionally been used for mucous membrane related disease states and gastrointestinal inflammation and irritation due to its demulcent and emollient actions, which are attributed to mucilage (acidic polysaccharides) (Felter 1898, Grieve 1931). Topical use in EoE may be soothing to inflamed oesophageal mucosa (Bone 2003).

**Hydrastis canadensis**

*H. canadensis* is a mucous membrane trophorestorative, anti-inflammatory and vulnerary herb that has been shown to inhibit production of TNF-α, IL-6, IL-10, and IL-12 in a dose-dependent manner in vitro (Clement-Kruzlo 2008). Traditionally it has been used for sub-acute and chronic gastrointestinal inflammation and gastric irritability (Felter 1898, Grieve 1931). *H. canadensis* may be of particular benefit in EoE, given that active inflammation of the oesophageal mucosa is common (Straumann 2012).

**Albizia lebbeck**

*A. lebbeck* is a powerful anti-allergic herb via inhibition of IL-4, IL-5, IL-13, histamine receptor 1, histidine decarboxylase signalling, Th2-cytokine signalling and alteration of the histamine-cytokine network (Nurul 2011). In vivo studies (rats) show that *A. lebbeck* is effective in treating atopic allergy, as it has been shown to reduce T and B-lymphocytes and stabilise mast cells (Tripathi 1979).

**Hemidesmus indicus**

*H. indicus* has been used in traditional Ayurvedic medicine as a topical anti-inflammatory herb (Bone 2003). Although there appear to be no clinical studies on *H. indicus*, it is thought to have potent anti-inflammatory, immune-modulating/suppressing and antioxidant properties. Phenolic acids are thought to be responsible for its effective use in gastrointestinal ailments and diseases in which high levels of oxidative stress are indicated (Jayaram 2011).

**Conclusion**

EoE is a chronic antigen-driven inflammatory disease. Herbs with anti-allergic, anti-inflammatory and demulcent actions should be considered for future clinical trials into possible herbal interventions. As the precise aetiology of EoE is still unknown, there is much scope for additional herbs that may have appropriate actions in prevention or treatment as more information is discovered. The research reviewed has demonstrated that various herbs
may be effective in reducing certain EoE inflammatory mediators. The anti-inflammatory abilities of certain herbs can work on the same inflammation pathways as many of the currently recommended pharmaceutical treatment options for EoE, such as corticosteroids, mast cell stabilizers and leukotriene inhibitors. To date there has been no research evaluating the efficacy and safety of any herbal medicines and likewise there is no traditional evidence describing the herbal medicine management for the treatment of EoE. In conjunction with this, EoE is a rare condition with large variability in symptom severity and sensitivity. Consequently, considerable caution must be taken when using herbal medicine to manage this condition. The rapidly increasing prevalence of the disease and the lack of long-term efficacy, poor compliance and safety issues associated with the currently recommended treatment options all support the call for more research into the use of herbal medicine in EoE.

References

Nurko S, Furuta GT. 2006. Eosinophilic esophagitis. GI Motility online doi:10.1038/gimo49.
Patterns of inter-professional communication between complementary and conventional practitioners providing maternity care services: a preliminary examination of the perceptions of CAM practitioner

continued from page 61


Ulcer protective effect of hydroalcoholic extract of *Bergia suffruticosa* in rats

Sandeep Kumar Thakur a, Nirav M. Ravat a, Mehul N. Jivrajani a, Ranjeet Prasad Dash a, Sheetal Anandjiwala b, Manish Nivsarkar *a*

a Department of Pharmacology and Toxicology, B. V. Patel Pharmaceutical Education & Research Development Centre, Ahmedabad, Gujarat, India.
b Department of Natural Products, National Institute of Pharmaceutical Education and Research, Ahmedabad, S. G. Highway, Thaltej, Ahmedabad, Gujarat, India

*Corresponding Author:*
Dr. Manish Nivsarkar, Department of Pharmacology and Toxicology, B. V. Patel Pharmaceutical Education & Research Development (PERD) Centre, S.G. Highway, Ahmedabad, Gujarat, India 380054
E-mail: manishnivsarkar@yahoo.com, Phone: +917927413219, Fax: +917927450449

**Abstract:** Peptic ulcer disease is very common. Various drugs are available for the treatment of ulcers but they have certain limitations. Plants and plant derived products may be viable resources for ulcer therapy due to their availability and affordability. Antulcer activity of hydroalcoholic extract (HAE) of *Bergia suffruticosa* was evaluated in rats by using pylorus ligation plus aspirin- and ethanol-induced ulcer models. Test extract (500 mg/kg) and ranitidine (150 mg/kg) were administered orally 30 min prior to ulcer induction on single dose. Total volume, pH and total acidity of gastric juice as well as ulcer index were the parameters evaluated to determine antulcer activity. The extract significantly reduced ulcer index (p<0.05) in test groups (0.13 ± 0.03) as compared to control group (1.30 ± 0.34) in ethanol-induced ulcer models. Similarly, in the pylorus ligation plus aspirin-induced ulcer model, the extract group showed significant reduction in the ulcer index (0.19 ± 0.02) in comparison (p<0.05) to the control group (1.09 ± 0.07). Significant reduction in total acidity and increase in the pH of gastric juice was also observed upon oral administration of HAE of *B. suffruticosa* in both models. The results of this study inferred that *B. suffruticosa* extract showed antulcer activity in animal models which might be attributed to the antioxidant compounds present therein.

**Keywords:** *Bergia suffruticosa*; total acidity; ethanol-induced ulcer; gastric ulcer; oxidative stress; pylorus ligation plus aspirin

**Introduction**

Peptic ulcers are sores that occur in the upper gastrointestinal tract, mainly the stomach and duodenum (Jamal 2006), in millions of people worldwide (Nilesh 2009). It is estimated that about 10% of the population is affected by ulcer (Aro 2006). The aetiology of a gastroduodenal ulcer is influenced by various aggressive and defensive factors such as gastric acid, pepsin or other digestive enzymes, mucosal barrier, mucous secretion, cell regeneration and other endogenous protective agents, including various prostaglandins (Repetto 2002, Ubaka 2010).

Excessive acid production was originally believed to be one of the major causes of peptic ulcer. Accordingly, conventional therapy was developed with the aim of neutralising and inhibiting the secretion of stomach acid. More recently infection in the stomach by bacteria called *Helicobacter pylori* (*H. pylori*) has been found to be a significant cause of ulceration. *H. pylori* is believed to be responsible for more than 80% of gastric ulcers with overall infection prevalence being 20-30%. The other significant cause of gastric ulcer is chronic use of anti-inflammatory medications (Wallace 2000, Bahuguna 2009).

For the treatment of ulcer *H. pylori* antagonists, proton pump inhibitors and cytoprotective agents are used. Ranitidine hydrochloride belongs to a class of medicines called *H*₂-receptor antagonists. This medicine works by reducing the amount of acid in the stomach. It is used to treat gastrointestinal ulcers as well as to relieve heartburn.

Treatment costs for peptic ulcer disease are estimated to be US$2-4 billion per year worldwide (Goldstein 2000, Ramakrishnan 2007). Ranitidine hydrochloride, commonly used to treat gastrointestinal ulcer as well as to relieve heartburn, belongs to a class of medicines called *H*₂-receptor antagonists. This medicine works by reducing the amount of acid in the stomach. Other treatments for peptic ulcer include proton pump inhibitors and cytoprotective agents. Most drugs used in the treatment of ulcer are effective but are not free from side effects; therefore, medicines from natural sources may be preferred for disease treatment (Bansal 2010).

More than 60% of the world’s population relies mainly on plants and plant extracts for health care. It has been
reported that about 30% of all plant species has been used for medicinal purposes at least once (Thomas 2000, Joy 2001, Verma 2008). An abundance of plants with antiulcer properties has been reported in the traditional literature; some plants contain a vast repertoire of antiulcer molecules which may, after possible chemical modification, provide new and improved antiulcer drugs (Shah 2006).

*Bergia suffruticosa* (Elatinaceae) was used traditionally to repair bones and heal wounds (Kirtikar 1991, Katewa 2005). Ethnomedical claims also report its use for stomach troubles and as an antidote to scorpion stings (Yousif 1983, Bedi 1978). The plant is reported to show antibacterial activity against *Bacillus subtilis*, *Escherichia coli*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* (Farouk 1983). The 95% ethanol extract of the whole plant is reported to exhibit molluscicidal activity against *Biomorphalaria pfeifferi* and *Bulinus truncalus* (Hadi 1984). Reports stated that the methanol extract exhibits good free radical scavenging activity (Anandjiwala 2007). Considering the ethanobotanical claims of wound healing activity and free radical scavenging, the antiulcer activity of the hydroalcoholic extract of *B. suffruticosa* whole plant was evaluated.

**Materials**

**Plant**

Whole plant of *B. suffruticosa* was collected locally in the month of February 2010 and authenticated by Dr. Sheetal Anandjiwala (taxonomist). A specimen of the collected plant was preserved in the Department of Pharmacognosy and Phytochemistry, B. V. Patel Pharmaceutical Education and Research Development (PERD) Centre, Ahmedabad (Herbarium Specimen #: BVP/PP/17/02/10).

**Preparation of hydroalcoholic extract**

The whole plants were washed, shade dried and stored in air-tight containers. Plant material was powdered and passed through a sieve. Initially, powdered drug (500 g) was extracted with 50% methanol (1000 ml × 3) under reflux on a water bath at 50°C. The hydroalcoholic extract (HAE) obtained was cooled, filtered and then concentrated by at 40°C under vacuum. The yield of HAE was 38 g (7.60 %w/w).

**Chemicals**

Aspirin was received as a gift sample from Troikaa Pharmaceuticals Ltd., Ahmedabad, India. Ranitidine was purchased from JB Chemicals (Mumbai, India) and agar was purchased from Qualigen Fine Chemicals, Mumbai, India. Gallicin was purchased from ICN Biomedicals, Irvine California, USA. Gallic acid was a gift sample from Tetrahedron, Chennai, India. All other reagents used in this study were of analytical grade and procured from a leading chemical house in India.

**Animals**

Albino Sprague-Dawley rats (n=18) of either sex weighing 150-200 g were obtained from the animal house of the BV Patel Pharmaceutical Education and Research Development (PERD) Centre, Ahmedabad, India. The animals were housed singly per cage in polypropylene cages and placed in the experimental room where they were allowed to acclimate for a week before experiment. A 10% air exhaust conditioning unit was maintained along with a relative humidity of 65 ± 5% and a temperature of 25 ± 3°C was stabilized. A 10:14 h light:dark cycle was also regulated for the experimental animals. Amrut-certified rodent diet (Maharashtra Chakan Oil Mill) and tap water (boiling hot water cooled to room temperature) was provided *ad libitum* to the experimental animals. All experimental protocols were reviewed and accepted by the Institutional Animal Ethics Committee (IAEC) prior to initiation of the experiment. Techniques with Good Laboratory Practice (GLP) were followed.

**Chromatographic analysis of hydroalcoholic extract of *B. suffruticosa***

Dried extract (100 mg each) of *B. suffruticosa* whole plant was dissolved in 50% methanol (50 ml) and used for the thin layer chromatography. TLC plates consisted of 10 × 10 cm and were precoated with silica gel 60 F254 (E. Merck) (0.2 mm thickness) with aluminum sheet support. The spotting device was a CAMAG Linomat V Automatic Sample Spotter (Camag Muttenz, Switzerland); the syringe, 100 μL (Hamilton); the developing chamber was a CAMAG glass twin trough chamber (10 × 10 cm); the experimental condition: temperature 25 ± 2°C, relative humidity 40%. TLC fingerprint for extract (100 mg/50 ml) along with standards, gallic acid and gallicin, was developed in the solvent system toluene: ethyl acetate: methanol: formic acid (6:3:1:0.5) as the mobile phase. The plate was air dried and observed under UV 254 nm (Anandjiwala 2007).

**Experimental set-up for ethanol-induced gastric ulcer**

Animals of either sex (150-200 g) were divided into three groups with 3 animals in each group. Animals were fasted overnight but water was provided *ad libitum*. The animals in group 1 (control) were pretreated with vehicle (0.2% agar suspension) and the animals in group 2 (positive control) were treated with the standard treatment i.e. Ranitidine (150 mg/kg body weight). Similarly the animals of group 3 (test group) were pretreated with 0.2% agar suspension of *Bergia suffruticosa* 500 mg/kg body weight. All the treatments were done 30 min prior to administration of 80% ethanol (1 ml/rat, p. o.) after a 12 hour fasting period.

Four hours after ethanol administration, the rats were euthanized by carbon dioxide (CO2) asphyxiation. The stomach was removed and washed with normal saline. Subsequently, the stomach was incised along the greater curvature and the ulcer index was calculated.
Experimental set-up for pylorus ligation and aspirin-induced gastric ulcer

Animals of either sex (150-200 g) were divided into three groups with 3 animals in each group. They were fasted overnight but water was provided ad libitum. The animals of group 1 (control) were pretreated with vehicle (0.2% agar suspension) and the animals of group 2 (positive control) were treated with the standard treatment i.e. Ranitidine (150 mg/kg body weight). Similarly the animals of group 3 (test Group) were pretreated with 0.2% agar suspension of *Bergia suffruticosa* 500mg/kg body weight. Pylorus ligation was performed after 30 min of drug administration after which the animals were dosed with aspirin (500 mg/kg bodyweight p. o.) via oral gavage.

The animals were euthanized by carbon dioxide (CO₂) asphyxiation, four hours post pylorus ligation. The stomachs were removed and washed with normal saline. Gastric content was carefully collected in a centrifuge tube and centrifuged at 1000 rpm for 10 min. The supernatant volume was measured and titrated against 0.01 N sodium hydroxide using phenolphthalein as an indicator for the estimation of total acidity (Prakash 2007). Subsequently the stomachs were incised along the greater curvature and the ulcer index was calculated.

Ulcer index was determined using the following formula (Desai 1999, Khare et al 2008):

\[
\text{Ulcer index} = 10/X \quad \text{where} \quad X = \text{total mucosal area} / \text{total ulcerated area}.
\]

Gastric tissue samples were fixed in 10% formalin while slides were stained with haematoxylin and eosin for histopathological examination.

**Statistical analysis:** Data were analysed using computer program MS Excel and GraphPad software. The results were expressed as mean ± S.E.M. Comparison of the mean was done using One-way ANOVA with Dunnett’s multiple comparison test and p-value of <0.05 was considered significant.

**Results and Discussion**

Chromatographic analysis of the herbal medicine extract showed five bands when observed under UV 254 nm, with the bands for gallic acid and gallicin at \( R_f 0.40 \) and \( R_f 0.58 \), respectively (Figure 1).

Antiulcer activity of *B. suffruticosa* extract was evaluated in ethanol and pylorus ligation with aspirin-induced ulcer models.

Tables 1 and 2 show the results for ethanol and pylorus ligation plus aspirin-induced models, respectively. In the ethanol-induced model, ulcer index was significantly reduced in test group (0.13 ± 0.03) as compared to control group animals (1.30 ± 0.34). Total acidity in the test group of the ethanol model was 56.00 ± 2.65 mEq/L which was significantly less (p<0.05) in comparison to control group (82.00 ± 2.08 mEq/L) and positive control (66.00 ± 2.52 mEq/L).

Ulcer index in the test group of pylorus ligation plus aspirin-induced model was 0.19 ± 0.12 which was significantly less in comparison to both the control (1.09 ± 0.07) and positive control (0.42 ± 0.19) groups. Gastric total acidity was 82.33 ± 2.33 mEq/L in the control group for pylorus ligation plus aspirin model. HAE of *B. suffruticosa* (57.00 ± 1.00 mEq/L) showed significant decline in the total acidity (p<0.05) in comparison to control and positive control groups (69.67±0.88 mEq/L).

**Table 1: Effect of hydroalcoholic extract of *Bergia suffruticosa* on ethanol-induced ulcers**

<table>
<thead>
<tr>
<th>Group No.</th>
<th>Treatment</th>
<th>pH</th>
<th>Volume of Gastric juice (ml)</th>
<th>Total acidity (mEq/L)</th>
<th>Ulcer index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>3.83 ± 0.33</td>
<td>1.07 ± 0.07</td>
<td>82.00 ± 2.08</td>
<td>1.30 ± 0.34</td>
</tr>
<tr>
<td>2</td>
<td>Positive Control (Ranitidine)</td>
<td>6.00 ± 0.58</td>
<td>1.17 ± 0.20</td>
<td>66.00 ± 2.52*</td>
<td>0.56 ± 0.07</td>
</tr>
<tr>
<td>3</td>
<td>Test</td>
<td>7.33 ± 0.67*</td>
<td>1.17 ± 0.22</td>
<td>56.00 ± 2.65*</td>
<td>0.13 ± 0.03*</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM, n = 3 in each group; statistical analysis by One-way ANOVA followed by Dunnett’s multiple comparison test using Graphpad software.

*p <0.05, n = 3*
Further, the results were supported by macroscopic and histopathological examination of stomach and its sections. Macroscopic changes of ethanol induced and pylorus ligation plus aspirin are shown in Figure 1. Control group showed severe damage to gastric mucosa. Pre-treatment with ranitidine and extract resulted in protection of gastric mucosa seen as marked reduction in ulcerated area.

Histopathological observations showed severe infiltration of inflammatory cells in the submucosa within the control group, along with infiltration of neutrophils when compared with positive control group and test group animals (Figure 2).

Pylorus ligation causes the accumulation of gastric juice in the stomach, while aspirin causes mucosal damage mainly by interfering with prostaglandin synthesis and causing gastric mucus depletion. Free radical production is also reported to be a cause of the pathogenesis of ulcer in pylorus ligation and an aspirin-induced ulcer model (Bafna 2005). It has already been reported that the active constituents gallic acid and gallicin present in *B. suffruticosa* have antioxidant and free radical scavenging properties (Anandjiwala 2007). A reduction in oxidative stress is considered to be one of the vital processes in ulcer healing (Melese 2011), which may be attributed to the presence of the antioxidant principles present therein. Ranitidine and HAE of *B. suffruticosa* whole plant attenuated the gastric volume, gastric pH total acidity and ulcer index (Table 2). Figure 2 shows the histopathological differences which confirm reduction in leukocyte infiltration and reduction in mucosal damage in the test group as compared to control.

Ethanol depletes the gastric mucus content, causes damage to mucosal blood flow and increases the permeability of plasma membranes. This causes oedema which leads to the leakage of proteins and mitochondrial depolarization, resulting in cell death and exfoliation of the epithelial layer (Repetto 2002). It is well known

### Table 2: Effect of hydroalcoholic extract of *Bergia suffruticosa* on gastric ulcers induced by pylorus ligation plus aspirin

<table>
<thead>
<tr>
<th>Group No.</th>
<th>Treatment</th>
<th>pH</th>
<th>Volume of Gastric juice (ml)</th>
<th>Total acidity (mEq/L)</th>
<th>Ulcer index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>3.83 ± 0.17</td>
<td>2.67 ± 0.33</td>
<td>82.33 ± 2.33</td>
<td>1.09 ± 0.07</td>
</tr>
<tr>
<td>2</td>
<td>Positive Control (Ranitidine)</td>
<td>6.67 ± 0.67*</td>
<td>4.67 ± 0.33*</td>
<td>69.67 ± 0.88*</td>
<td>0.42 ± 0.19*</td>
</tr>
<tr>
<td>3</td>
<td>Test</td>
<td>8.07 ± 0.58*</td>
<td>3.83 ± 0.17</td>
<td>57.00 ± 1.00*</td>
<td>0.19 ± 0.12*</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM, n = 3 in each group; statistical analysis by One-way ANOVA followed by Dunnett’s multiple comparison test using Graphpad software.

*p <0.05, n = 3

Figure 2: Protective effects of hydroalcoholic extract of *Bergia suffruticosa* whole plant in gastric ulcer.

Control* (2A), Positive control treated with Ranitidine* (2B), Test Group treated with Test extract* (2C), Control** (2D), Positive control treated with Ranitidine** (2E), Test Group treated with Test extract** (2F):

* Ethanol induced model, ** Pylorus ligation plus aspirin-induced model.
that superoxide anion and hydroperoxy free radicals are generated during ethanol metabolism (Wasman 2010). The role of oxygen-derived free radicals is well established in acute and chronic ulceration in the stomach. Ethanol-induced ulcer model has been used for studying the cytoprotective action of herbal drugs such as Aspilia africana (Ubaka 2010). Pre-treatment with HAE of B. suffruticosa revealed protection of gastric mucosa and inhibition of leukocyte infiltration (Figure 3). Furthermore, the test extract also reduced total acidity and pH along with ulcer index (Table 1).

Conclusion
The present study shows that HAE of B. suffruticosa can ameliorate gastric ulcers in vivo, probably due to the anti-oxidative potential of this herb. However, further fractionation of the extract as well as mechanistic studies will provide better understanding of the ulcer protective action of B. suffruticosa.

Conflict of Interest
The authors declare that there are no conflicts of interest.

Acknowledgement
The authors would like to thank management of BV Patel PERD Centre for providing all facilities for the successful completion of this work.

References
Bilateral pitting oedema with multiple aetiologies

Sophie Atkin  BHSc (Naturopathy)
Email: sophie.naturopath@gmail.com

Oedema is the accumulation or retention of fluid within the interstitial spaces. Rather than being a problem of fluid excess, oedema indicates a problem with fluid distribution where fluid moves out of the capillaries or lymphatics into the surrounding tissues (McCance and Heuther 2010).

Symptoms of oedema can involve swelling of body tissues or can be more systemic to include weight fluctuation, general tightness and stiffness in the body (McCance and Heuther 2010). Depending on the site and cause of the swelling, oedema is categorised as either local or generalised (Jarvis 2004).

Local oedema may occur around the site of direct trauma such as in a sprained ankle (Jarvis 2004) or may be a sign of more serious disease such as ascites of an injured or infected organ (Hastings 2005). Generalised oedema often presents in the feet and legs as gravity pulls the fluid into the lower extremities (McCance and Heuther 2010). Generalised oedema can be recognised by using two fingers to press away the fluid in the tissues around the nearest bone. If a pit is left in the skin, pitting oedema becomes the diagnosis (McCance and Heuther 2010).

Known aetiologies for oedema include a high salt intake (Hastings 2005), hormonal dysfunction associated with the menstrual cycle (Rosenfeld et al 2008), medications such as the oral contraceptive pill (Gorman et al 2001), allergic reactions, and infections and inflammation (McCance and Heuther 2010). More serious causes can include trauma (Katayama and Kawanmata 2003), burns (Demling 2005) and cancer (McCance and Heuther 2010).

Presenting complaint

‘Lauren’, a 24 year old speech pathology graduate, presented with bilateral fluid retention in her ankles. The fluid was pooled around the ankles and feet, becoming less evident a few centimetres above the top of the anklebone. There was no numbness or discomfort, only heaviness in the legs. Pitting was evident around the ankles and Lauren noted that she had recently put on 5 kg and was feeling puffy and swollen in her hands, stomach and legs.

The fluid build-up in her ankles began five years ago, coinciding with Lauren moving out of home to attend university, changing her diet, ceasing regular exercise, increasing her alcohol intake and starting the oral contraceptive pill (OCP). Over the past 12 months, the swelling had worsened to the point that at times her ankles would ‘disappear’. It was unclear as to why the symptoms had worsened over this period, which correlated with her GP’s diagnosis of idiopathic oedema.

Lauren commented that the swelling was noticeably worse in hot weather, when she was stressed, and a few days before her period. Lauren could not identify anything that relieved the swelling.

In addition to the ankle swelling and generalised fluid retention, Lauren reported that her menstrual cycle symptoms had increased and she was experiencing mood changes (irritability) and increasing levels of menstrual pain. All these symptoms began two days prior to her period. On further questioning we determined that both physical and mental symptoms resolved with onset of the menstrual flow. In general, Lauren described herself as a ‘stressy’ and emotional person and her boyfriend had been commenting that she was getting much more irritable with each cycle.

Lauren explained that she was often exhausted from her busy social life and commented that she often did not get enough recovery time. She woke 1-2 times during the night to urinate and the disturbed sleep was adding to her fatigue. Lauren was also experiencing diarrhoea which was aggravated by her menstrual cycle and within a few hours of consuming milk. The diarrhoea did not affect the ankle swelling, but did impact on the generalised fluid retention.

It is significant that the oedema began when Lauren moved out of home and began to eat poor quality meals; however, at the time of consultation, Lauren’s diet was high in fruit and vegetables, with only occasional junk food. Most days Lauren would drink 2-3L of water. Lauren continued to binge drink on weekends and consume milk and cheese most days even though it often resulted in diarrhoea. Additionally, her protein intake was low – although she enjoyed meat, she found it cheaper and easier to cook and prepare high carbohydrate meals based on pasta and bread. Lauren also admitted to being a ‘salt addict’, adding salt to all her meals.

Lauren enjoyed exercise, but at the time of this appointment was doing very little and, at most, would ride her bike for 30 minutes twice a week.

Medical history

Lauren’s childhood medical history was unremarkable with no major illness or injuries. She had not caused any trauma to her ankles that she could remember. Prior to her naturopathic appointment, Lauren had been under the care of her GP and had been given the diagnosis of idiopathic oedema without any treatment. She had not tried any natural remedies for her oedema or premenstrual syndrome (PMS) and was managing the...
pain with paracetamol for two days of every month. She was currently taking the OCP.

Pathology and Investigations
Lauren’s GP had referred Lauren for pathology testing. Pathology tests included full blood examination (FBE), thyroid-stimulating hormone (TSH), serum electrolytes, liver-function tests and lipid profile. These results showed nothing of clinical significance and her GP had not recommended any intervention. The above tests are the standard first line of testing for this type of oedema.

Aside from the pathology tests, typical clinical investigations for oedema include palpation to determine pitting, pain and tenderness, examination of lymphatic groin nodes to rule out the possibility of cellulitis, and examination of the leg and foot to determine if ulcers, colour change, temperature change or gangrene are present (Jarvis 2004). During the naturopathic consultation, pitting was the only one of these that was observed.

If the swelling is severe it is recommended to measure the circumference of the ankles with a tape measure to rule out a diagnosis of deep vein thrombosis (DVT) or specific lymphoedema (Jarvis 2004). This was not done in this case, but would have been an objective way to measure improvement.

Family and social history
Lauren’s mother, maternal grandmother and sister all had varicose veins. Both paternal and maternal grandfathers had passed away from heart attacks. Lauren’s father had a heart attack at age 67 and was currently on several medications to prevent further complications.

Observations and physical examination
Lauren was slightly overweight (5kg) with a waist circumference of 90cm.

Clinical observations in this consultation included tongue, iris and nail examination. Her tongue and nails showed no abnormalities, but her iris showed a lymphatic rosary and she had dark circles under her eyes. At the time of consultation, Lauren did not look ‘puffy’ in her hands or face but she explained that this was always worse in the morning and with her menstrual cycle. Palpation at the medial malleolus (ankle) showed grade 2 oedema. The oedema was measured by the depth of the pitting in centimetres (Jarvis 2004). Lauren noted that her bowels were most often type 4 on the Bristol stool chart.

Diagnosis
Pitting was evident around both ankles where the fluid retention was most severe, but there was no evidence of trauma or injury to the ankles. The patient also suffered from general body puffiness and weight gain which fluctuated with the menstrual cycle. All of these factors are supportive of the diagnosis of idiopathic pitting oedema made by her GP following blood tests that showed nothing of significance.

Treatment
The initial consultation focused on determining the underlying causes of the oedema. Lauren had bilateral pitted swelling of the ankles which can be indicative of a systemic problem such as heart failure, liver cirrhosis or nephrotic syndrome (Jarvis 2004). Given her young age and that the pathology results for liver function tests (LFT) and serum electrolytes were all clear, these were unlikely. Although pathology testing showed nothing of significance, the naturopathic clinical examinations and observation, combined with a complete case history, were helpful in recognising some of the underlying causes and formulating a treatment plan.

The main underlying causes identified in this case were diet (high salt), allergy or intolerance (to dairy) and hormonal imbalance. These are all known causes of oedema (Hastings 2005, Rosenfeld et al 2008, McCance and Heuther 2010). Her sedentary lifestyle, in combination with the iridology signs that suggested lymphatic involvement (i.e. lymphatic rosary), were also significant as poor movement of lymphatic fluid around the body may contribute to generalised fluid retention (Miller 2008).

The treatment aims following the first consultation were to alleviate the diarrhoea (possibly from dairy intolerance), improve hormonal balance and reduce the fluid retention. These aims focused on all of the identified causes. The treatment aims were achieved through diet and lifestyle modifications combined with herbal and nutritional supplementation.

Diet
An allergy or intolerance can be a cause of generalised oedema and Lauren noticed an obvious reaction in her bowels after eating dairy. A dairy allergy had not been formally diagnosed but it was thought that intolerance was possible. She was advised to remove dairy for a full 4 weeks to determine if this would improve her diarrhoea and subsequently her oedema. High salt intake has been linked to fluid retention (Hastings 2005) and Lauren committed to restricting her salt intake to a small pinch daily.

She was advised to include an extra handful of fresh vegetables daily to improve her potassium/sodium balance. Despite drinking 2-3 L of water daily, Lauren was still experiencing long-term oedema. Drinking lots of water can help to reduce fluid retention by flushing out metabolic waste; however, this requires healthy intracellular function (Hastings 2005). Her water intake was adequate and it was hoped that fluid retention would improve without the need for further water supplementation.

Lifestyle
Lifestyle recommendations included an Epsom salt bath once a week and daily dry skin brushing. These are traditional naturopathic methods used to increase circulation and distribute fluid more evenly around the body. They may be useful for generalised oedema.
Herbal/nutritional medicines

Lauren was happy to partake in dietary change and also herbal and nutritional supplements. The following herbal and nutritional tablet (see Table 1) was chosen to reduce the oedema. In particular, Arctostaphylos uva-ursi, Galium aparine, Equisetum arvense, B1 and B6 are noted for their diuretic actions. Although the dose of vitamins B1 and B6 are low (total 30g and 26g/day respectively), they combine well with the herbs to potentiate diuretic action (Braun and Cohen 2010). Quercetin and vitamin E may be beneficial for oedema with cardiovascular, allergic or venous aetiology (Braun and Cohen 2010). On observation, Lauren did not have direct signs of overt cardiovascular or venous pathology, but she has a strong family history of both conditions.

The following herbal tincture (see Table 2) was prescribed for the dysmenorrhoea and mood. The aim of this mixture was to reduce smooth muscle spasm in both the bowel and uterus (Matricaria recutita, Angelica sinensis), reduce congestion in the uterus (Paeonia lactiflora, Angelica sinensis), balance oestrogen and progesterone levels (Rhodiola rosea, Paeonia lactiflora and Angelica sinensis) and support mood (Bone and Mills 2013).

BioQ150 (Healthworld, Northgate, Australia) was also prescribed and Lauren was to take 1 capsule daily in the morning. CoQ10 can improve oedema through strengthening the capillaries so as to reduce fluid leakage into the tissues (Braun and Cohen 2010). Lauren did not have overt signs of varicose veins, but she had a strong family history of both cardiovascular disease and venous weakness. CoQ10 may be prescribed as a long-term preventative measure based on her family history and the connection between cardiovascular illness, vein insufficiency and oedema.

Follow up (after 1 month)

The oedema had started to improve by the end of four weeks and Lauren remarked that she could see her ankles for the first time in five years. On this visit the oedema was still present but improving. Her digestion was much improved with no bloating and bowel function returning to normal. She found dairy easy to avoid. She had eaten cheese once with obvious loose bowels and bloating within 20 minutes and so was happy to abstain from dairy in the longer term. Her mood was also greatly improved and she remarked that she felt like her normal happy self again. However, she had finished the liquid herbs one week prior to her second appointment and had noticed some moodiness again.

Treatment

In the second consultation Lauren was taught to track her oedema (by palpation) and was instructed to keep a diary of the fluctuations. Otherwise, the treatment plan was to keep all medications the same to allow the fluid to completely drain and the lymphatic system to repair.

Table 1: Herbal and nutritional tablet

<table>
<thead>
<tr>
<th>Herb</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galium aparine, whole plant dry</td>
<td>3 g</td>
</tr>
<tr>
<td>Arctostaphylos uva-ursi, leaf dry</td>
<td>1.1 g</td>
</tr>
<tr>
<td>Equisetum arvense whole plant dry</td>
<td>500 mg</td>
</tr>
<tr>
<td>Quercetin</td>
<td>100 mg</td>
</tr>
<tr>
<td>Thiamine hydrochloride (B1)</td>
<td>15 mg</td>
</tr>
<tr>
<td>Pyridoxine hydrochloride (B6)</td>
<td>13 mg</td>
</tr>
<tr>
<td>d-alpha – Tocopheroll acid succinate Equiv. Vit E</td>
<td>83 mg 100 IU</td>
</tr>
</tbody>
</table>

Dose: 1 tablet morning and night with meals

Table 2: Herbal tincture

<table>
<thead>
<tr>
<th>Herb</th>
<th>Conc.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matricaria recutita</td>
<td>1:2</td>
<td>25 ml</td>
</tr>
<tr>
<td>Angelica sinensis</td>
<td>1:1</td>
<td>25 ml</td>
</tr>
<tr>
<td>Paeonia lactiflora</td>
<td>1:2</td>
<td>25 ml</td>
</tr>
<tr>
<td>Rhodiola rosea</td>
<td>2:1</td>
<td>25 ml</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100 ml</td>
</tr>
</tbody>
</table>

Dose: 5 ml morning and night.

Follow up (after 2 more months)

Lauren’s ankles continued to improve with very minimal swelling. Through tracking the oedema in her diary she had noticed that the swelling would fluctuate and, apart from very hot days, the swelling was minimal. Lauren had had another period and the swelling had been minimal.

With the improvement to her health, Lauren had started to exercise daily; however, her life had become very hectic with no weekends at home in three months due to social engagements. As a result, Lauren was feeling much more teary and emotional and the liquid herbs did not seem to be working as well as they had previously.

Treatment

Ongoing treatment was aimed at continuing the herbal tablet and CoQ10 to prevent any further build-up of fluid in the legs. At this appointment there was a discussion about Lauren’s need to rebalance her recreational time as she was finding it difficult to balance full time work with such a busy social life. She decided to commit to one weekend at home each month without any social engagements.

The previous herbal tincture was changed (Table 3) to better support the adrenal glands whilst she integrated some changes to her lifestyle. As her digestion had greatly improved since stopping the dairy products, it was decided that Matricaria recutita was no longer required. Lauren was tired from her busy lifestyle and to give stronger adrenal support Rhodiola rosea was replaced with Panax ginseng and Glycyrrhiza glabra (Bone and Mills 2013). Although Lauren’s period pain
had improved, the long term support of *Bupleurum falcatum*, *Paeonia lactiflora* and *Angelica sinensis* would continue for two more cycles.

### Ongoing Plan

Lauren’s treatment plan will need to continue until her ankle oedema has resolved completely. The aim at this point is to revise in 3 months.

### Discussion

One of the most interesting aspects of this case was that, although Lauren’s condition was medically diagnosed as idiopathic oedema (oedema of an unknown cause) there were many possible causes from a naturopathic perspective. A comprehensive case history, in combination with naturopathic observations and clinical testing, can shed light on further underlying causes. It was only after these had been identified and addressed that improvement was made for this patient. This suggests that even when an idiopathic diagnosis is made and pathology tests come back clear, it is still worthwhile to look deeper for an underlying cause.

Although ankle oedema can be a sign of a more severe medical condition (Hastings 2005), it may also be due to much less sinister faulty mechanisms such as menstrual-cycle imbalances (Rosenfeld et al 2008) and allergy (McCance and Heuther 2010). Poor diet and lifestyle choices may exacerbate this (Hastings 2005). A combination of these factors was enough to cause high levels of oedema in Lauren’s ankles.

From a naturopathic perspective, the notion of the lymphatic system/fluid can mean peripheral oedema from causes other than the specific lymphatic structures, such as the vascular structures (Miller 2008). With this in mind, Lauren’s family history of varicose veins and cardiovascular disease becomes clinically relevant, as does the lymphatic rosary observed in her iris. Thus it would appear that strategies for improving diuresis and circulation are helping to resolve her symptoms. It is most likely that Lauren’s predisposition towards this type of lymphatic stagnation was exacerbated when she commenced university and started eating a more processed (high salt/low potassium) diet. Given that there are both genetic and lifestyle related aetiologies, it was important to approach Lauren’s case from both a symptomatic and preventative viewpoint.

Lauren is very compliant with all medications and advice given and the treatment appears to be working well. In the future it will be important to move to a more preventative strategy to maintain long term results.

### References


---

### Table 3: Modified herbal tincture

<table>
<thead>
<tr>
<th>Herb</th>
<th>Conc.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panax ginseng, root</td>
<td>1:2</td>
<td>20 ml</td>
</tr>
<tr>
<td>Angelica sinensis, dry root</td>
<td>1:1</td>
<td>20 ml</td>
</tr>
<tr>
<td>Bupleurum falcatum, root dry</td>
<td>1:2</td>
<td>20 ml</td>
</tr>
<tr>
<td>Glycyrrhiza glabra, root dry</td>
<td>1:1</td>
<td>20 ml</td>
</tr>
<tr>
<td>Paeonia lactiflora, root dry</td>
<td>1:2</td>
<td>20 ml</td>
</tr>
<tr>
<td>Zingiber officinale, root dry</td>
<td>1:2</td>
<td>10 ml</td>
</tr>
</tbody>
</table>

5 ml 3x a day for 1st cycle then reduce dose to 5 ml morning and morning.

Mondal AK, Hegde S, Patki PS.

Title of the article:
A clinical study to evaluate the efficacy and safety of \textit{Bacopa} Caplets in memory and learning ability: a double blind placebo controlled study

Citation:

Corrections:
A: On page no. 122, 2nd column, 3rd paragraph, printed as:
"They contain extracts of \textit{Bacopa monnieri} 100 mg and powders of \textit{Bacopa monnieri} 650 mg to be taken in a dose of 1 caplet daily"

Has to be corrected to:
"They contain extracts of \textit{Bacopa monnieri} 250 mg and powders of \textit{Bacopa monnieri} 500 mg to be taken in a dose of 1 caplet daily"

B: On page no. 123, 1st column:
1. The 4th paragraph, under the section-Intervention, printed as
"The intervention was in the form of 12 weeks of a daily tablet comprising extract of \textit{Bacopa monnieri} whole plant 100 mg and powders of \textit{Bacopa monnieri} whole plant 650 mg"

Has to be corrected to:
"The intervention was in the form of 12 weeks of a daily tablet comprising extract of \textit{Bacopa monnieri} whole plant 250 mg and powders of \textit{Bacopa monnieri} whole plant 500 mg"

2. The 5th Paragraph, under the section-Composition, printed as
"Each caplet contains:
• Extract \textit{Bacopa monnieri} whole plant 100 mg
• Powder \textit{Bacopa monnieri} whole plant 650 mg"

Has to be corrected to:
"Each caplet contains:
• Extract \textit{Bacopa monnieri} whole plant 250 mg
• Powder \textit{Bacopa monnieri} whole plant 500 mg"
Reviews of articles on medicinal herbs

Tessa Finney-Brown, Kate Ray, Sarah Harvey

These abstracts are brief summaries of articles which have appeared in recent issues of herbal medicine journals, some of which may be held in the NHAA library.

Berries for heart health


One of the leading causes of death and morbidity worldwide is coronary heart disease (CHD), a condition that predominantly affects older age groups. For this reason most studies on CHD have examined data in older men and women. However, in the last few decades increasingly younger age groups are being affected by this condition. Risk factors for CHD may vary at younger ages, with differences between men and premenopausal women being important. Metabolic changes at menopause lead to alterations in CHD risk for women. It seems that young and middle-aged women have different mechanisms underlying most cases of CHD, with vasospasm (a consequence of endothelial dysfunction) playing a much more important role. For these reasons it is important that research be directed toward understanding which factors modify CHD risk in pre- and post-menopausal women.

One dietary component which has attracted some attention for its cardioprotective effects are dietary flavonoids. These are phytochemicals which are widely distributed in many plant foods and beverages including tea, wine and many fruits and vegetables. In laboratory and clinical research various flavonoids have demonstrated the ability to improve endothelial function by exerting anti-inflammatory effects, inhibiting low-density lipoprotein oxidation and endothelial NADPH oxidase, modulating nitric oxide synthase activity/expression and augmenting nitric oxide status. These actions may be beneficial in preventing vasospasm related CHD in middle-aged and younger women. At present data is limited on which subclasses of flavonoids might be associated with reduced risk of CHD.

The current study investigated the hypothesis that anthocyanins, flavonols and flavonoid polymers, classes of flavonoids found in berries, tea, onions and apples, were protective against CHD in young and middle-aged women. These particular flavonoids were focused upon as other research had already identified them as being associated with blood pressure reductions and beneficial effects on biomarkers of CHD in this group.

Researchers took data from the Nurse’s Health Study which was collected between 1991 and 2009. Semi-quantitative food frequency questionnaires were conducted every four years and the primary outcome measure was incident myocardial infarction (MI) and fatal CHD occurring during this follow-up period.

Over the time, among 93,600 participants, 405 cases of incident MI were recorded, at a median age of 48.9 years. While women with higher anthocyanin intake smoked less, exercised more and had lower fat and higher fibre intakes, researchers adjusted for these factors in their analysis. After multi-variate analysis there was an inverse association noted between anthocyanin intake and MI risk. The greatest reduction in risk was 32% between those in the highest and lowest quintiles of anthocyanin intake.

Anthocyanins are richest in red/blue fruits, especially berries, which were the main foods included in this study. In this study those consuming more than 3 servings of these foods per week had a significantly lower risk of suffering fatal or non-fatal MI, independent of any other dietary or non-dietary risk factors for CHD. Researchers suggest that this may be due to beneficial effects on blood lipids and endothelial health. Practitioners may wish to use this information when designing diet and health plans for young and middle age women at risk of or concerned about coronary heart disease and myocardial infarction.

Chamomile may exert antidepressant activity


Chamomile has recently been shown to improve anxiety and depressive symptoms in patients with generalized anxiety disorder. Chamomile has also been used as an anxiolytic agent traditionally dating back as far as ancient Greece and Rome. This study explored the hypothesis that chamomile would demonstrate clinically meaningful antidepressant effects in conjunction with its already observed anti-anxiety activity.

The authors evaluated the data from a randomised, double-blind, placebo-controlled trial of an oral extract of chamomile (Matricaria recutita) in humans with comorbid anxiety and depression. The parameters of antidepressant and anti-anxiety activity were measured using the Hamilton depression rating questionnaire (HAM-D) and the scores analysed with generalised
estimating equations to examine whether a clinically meaningful reduction in depression would occur over time as compared to placebo. The participant’s (n=57) inclusion criteria consisted of: >18y/o, a primary DSM-IV diagnosis of Generalised Anxiety Disorder, mild to moderate symptoms of depression, and a minimum baseline score of >9 on the Hamilton anxiety rating questionnaire. Using block randomisation the participants were divided into two groups: the intervention group received capsules of chamomile (220mg-standardised to contain 1.2% apigenin) and the placebo group received an identical 220mg placebo capsule (lactose monohydrate). Treatment commenced with one capsule daily and was increased to two capsules daily in the second week. For patients who had a <50% reduction in total HAM-D score the dosage was increased to three capsules/day in week 3, four capsules/day in week 4 and five capsules/day in week 5 through to week 8.

Results were collected by a doctor or nurse at baseline and at weeks 2, 4, 6 and 8. The study treatment outcomes were determined by scores on the Hamilton Depression Rating Scale (HAM-D) including core mood items (depressed mood, guilt, suicidal ideation). The results showed a significantly greater reduction in HAM-D scores over time in the chamomile group vs. placebo (P<0.05). These results suggest that chamomile may have antidepressant activity in addition to its documented anxiolytic action. Although the mechanism is not known for this activity, the authors hypothesize that it could be independent of the plants anxiolytic action and possibly involve flavonoid modulation of the central noradrenaline, adrenalin and dopamine neurotransmission, in conjunction with HPA (hypothalamus, pituitary adrenal cortex) modulation.

This study has several limitations, namely the small sample size, short duration and lower dosages utilised. This was an exploratory study to be built upon with further research, more specifically a clinical trial in patients with depression as their primary diagnosis is warranted.

**Achillea millefolium may decrease bleeding tendency in patients with chronic kidney disease**


A double-blind, randomised, placebo-controlled clinical trial was undertaken to assess the effect of yarrow flowers on uraemic bleeding in patients with chronic kidney disease. Increased bleeding tendency is one of many complications associated with chronic kidney disease and is thought to be attributed to platelet dysfunction due to elevated production of prostacycline and nitric oxide. *Achillea millefolium* was named after Achilles who used the plant to stem the bleeding of his warrior’s injuries. The anti-haemorrhagic properties of *A. millefolium* have not yet been explained by precise pharmacological evidence. The current treatment of uraemia that has proven to be safe and effective is conjugated oestrogen therapy which decreases concentration of nitric oxide. Thus this study used plasma nitric oxide and nitrate concentrations as a measure of the herb’s activity.

Patients with chronic kidney disease with a glomerular filtration rate of between 15 mL/min/1.73 m2 and 60 mL/min/1.73 m2, and no active bleeding disorders, were randomised into group 1 (n=16), receiving 1.5g of powdered yarrow flowers 3 days/week over 2 months, or placebo (n=15). Venous blood was taken at baseline and at 2 months, and plasma nitrite and nitrate was measured using high performance liquid chromatography.

The study found that during the two month intervention of *Achillea millefolium*, plasma nitrite and nitrate levels decreased whilst they increased in the group receiving placebo; however, it was not a statistically significant difference. This may be due to small sample size, long dosage intervals and/or the low dose utilised. Low-dose intervention was necessary here to establish safety data for patients with chronic kidney disease and *A. millefolium* as there is currently a lack of adequate data detailing pharmacokinetic and pharmacodynamic activity for this herb. No overdose symptoms were noted but one female subject was excluded from the study after developing a skin rash. Although insignificant statistically this data is highly suggestive of the nitric oxide scavenging properties of *A. millefolium* in patients with CKD. Limitations to this study were the small sample size and the lack of bleeding time monitoring.

**Green tea catechins and their impact upon glycaemic control**


As noted in another Medjourn abstract, type 2 diabetes mellitus (T2DM) is increasing in prevalence worldwide. In primary, secondary and tertiary diabetes prevention, dietary management of hyperglycaemia has an important role as increasingly there is an acknowledgement that not only foods but also beverages make a difference to dietary patterns and health outcomes.

Green tea (*Camellia sinensis*) is a rich source of bioactive ingredients including a specific type of flavonoid known as catechins (GTCs) which include catechin, epicatechin, epigallocatechin, epicatechin-3-gallate, epigallocatechin gallate (EGCG), gallo catechin, catechin gallate and gallo catechin gallate. Of these, EGCG has been the subject of much research and has in previous studies been shown to exert antidiabetic effects. Green tea
also contains caffeine which itself may reduce diabetes risk via increasing levels of energy expenditure. It is uncertain whether the combination of ingredients in green tea would exert synergistic effects in T2DM prevention.

Studies of EGCG, green tea and caffeine in animal and human models have yielded mixed results. In attempts to determine more definitive relationships between the factors, researchers in China recently completed a meta-analysis of the effects of GTC with or without caffeine on glycaemic control.

Twenty two randomly controlled human trials were eligible for analysis and overall involved 1584 subjects. The pooled analysis showed that fasting blood glucose levels decreased significantly with the use of GTC, with or without caffeine. On the other hand, fasting blood insulin, glycated haemoglobin and HOMA-IR did not. Sub-group analysis revealed that the effects on blood glucose were apparent at a median timeframe of 12 weeks.

Potential clinical application of the results suggests that green tea may be a useful lifestyle or supplementary adjuvant to treat or prevent hyperglycaemia in clients. Either caffeinated or non-caffeinated forms appear useful but may need to be continued for 3 months or longer to see benefits.

**Nigella sativa is beneficial in treatment of hyperlipidaemia**


Atherosclerosis is one of the biggest causes of death in Australia. Although its aetiology is varied, hypercholesterolaemia due to increased low density lipoproteins (LDL) is the predominant cause. This randomised placebo-controlled clinical trial was designed to ascertain the effectiveness of *Nigella sativa* in the treatment of hyperlipidaemia. The trial included 88 patients >18y/o and all with a total cholesterol reading of >200mg/dL. Patients on lipid altering medications, or who were pregnant, lactating or smoking, or diagnosed with: cardiovascular disease, diabetes mellitus, renal, liver or thyroid disease, were excluded from the study.

The intervention group (n=3) received capsules containing 500 ±10mg *Nigella sativa* crushed seeds equivalent to 2g/day for 4 weeks. Patients were instructed to consume 2 capsules twice/day before food. Patients were also instructed not to change their diets during the study period. Non-compliant patients were not included in the statistical analysis (n=14).

Results were determined using data obtained from fasting lipid profiles and fasting blood sugar at baseline and at the end of four weeks intervention, and compared to placebo group (n=37). Total cholesterol decreased by 4.78%, LDL cholesterol decreased by 7.6% and triglyceride (TG) level reduced by 16.65% in the *N. sativa* group. Thus a statistically significant decrease of serum total cholesterol, LDL and TG’s (p value <0.001) was observed in the *Nigella sativa* group. Given that dietary reductions were controlled for, this decrease can be attributed to the plant’s activity.

Phytosterol activity, antioxidant effects and *Nigella sativa’s* ability to decrease cholesterol synthesized in the liver and reduce absorption of dietary cholesterol may be responsible for the herb’s hypcholesterolaemic effects. Activation of LDL receptors in circulation and enhanced cholesterol secretion in bile are other possible mechanisms of action. Furthermore, the antioxidant capacity may prevent lipid peroxidation that is central to the development of atherosclerosis. In addition to the above, previous research has indicated that *N. sativa* is useful in the treatment of hypertension and diabetes, two key aetiologies for atherosclerosis.

Limitations to this study were the short duration and the lack of precision with regard to relying on patients to control for important variables such as diet and exercise; therefore, more research with larger samples and of longer duration are warranted. Nevertheless, this study portrays that treatment with *Nigella sativa* has clinically significant value for patients with hyperlipidaemia.

**Pre-diagnosis soy consumption and lung cancer survival**


Soy foods have been variously lauded and vilified for their link to various cancers, particularly hormonally-related cancers such as prostate, breast and endometrial cancer. Highly variable results in epidemiological studies and murine models have lead many practitioners to be cautious and confused about recommending a diet high in soy when a client has a cancer diagnosis or risk.

A new study out of China now adds further to the body of knowledge around this issue. Researchers assessed the impact of soy intake on lung cancer survival in 74, 941 Shanghai women who participated in the Women’s Health Study. At enrolment, and after 2 years of follow-up, the women were questioned about their usual dietary intake of soy foods, including soy milk, tempeh, tofu, dry and fresh soybeans, soy sprouts and other types of soy foods. Proportional hazard models were then used to evaluate links between soy intake and overall survival in the 444 women in the study with incident lung cancer.

Of those diagnosed with lung cancer, 318 died during follow-up. Initial analyses, including all patients, showed that a higher intake of soy foods was associated with better overall survival. Researchers adjusted for demographic, lifestyle and other non-clinical factors that may have impacted results. Even greater effectiveness was seen after adjustment for tumour stage and treatment.
Compared with the average intake of soy food, fully adjusted hazard ratios for total mortality associated with the 10th, 30th, 70th, and 90th percentiles of intake were 1.81 (95% CI, 1.26 to 2.59), 1.25 (95% CI, 1.09 to 1.42), 0.88 (95% CI, 0.80 to 0.97), and 0.89 (95% CI, 0.68 to 1.16). Isoflavone intake was associated with similar inverse associations.

This is the first study to suggest that higher intakes of soy foods prediagnosis are associated with a better overall survival in female lung cancer sufferers. Practitioners may wish to take this study into account when providing dietary recommendation to smokers and lung cancer sufferers. It is also important to consider which types of soy foods the women were most likely to have been consuming, as they may have been more traditional than many of the forms of soy available for consumption in Australia.

**Hypoglycaemic and antioxidant potential of sandalwood**


The East Indian sandalwood tree, *Santalum album* L., has numerous uses in traditional medicine as an antiseptic, diuretic, expectorant, stimulant and antiviral. Additionally the purified essential oil constituent α-santalol has been found to be effective as an antiviral, cytotoxic, apoptotic and anti-*Helicobacter pylori* agent. This study, however, undertook the evaluation of the in-vivo anti-diabetic and antioxidant efficacies of sandalwood oil and α-santalol in experimentally induced diabetic mice.

The mice were divided into groups including normal control group, α-santalol treated group, sandalwood oil treated group and oxidative stress induced control group. Hyperglycaemia was induced in the mice by three doses of alloxan. The control group was treated with glibenclamide resulting in the restoration of body and liver weights and a 70% reduction in blood glucose levels. Blood glucose levels were also lowered in the groups treated with α-santalol (100mg/kg BW) and sandalwood oil (1g/kg BW) by 61% and 71% respectively.

Mice with D-galactose-caused liver damage and oxidative stress induction were treated with α-santalol and sandalwood oil (1g/kg BW) resulting in restoration of body and liver weights and an increase in factors such as hepatic glutathione S-transferase (GSH) activity and sulfhydryl levels(SH), as well as an increase in the level of the free radical scavenger superoxide dismutase (SOD).

The results of this animal study showed a significant improvement in blood glucose status comparable to that produced by glibenclamide and an improved antioxidant status with administration of sandalwood oil and α-santalol. The dual action could be useful in preventing complications associated with the onset of diabetes mellitus.

Since the sandalwood oil used in this investigation contained approximately 53.8% of α-santalol it could be assumed that this is the most bioactive principle of the oil contributing to the anti-hyperglycemic and antioxidant properties. However, the possibility of synergy with other minor constituents should not be overlooked.
INTRODUCING

BIoCeuticals®
Quality NutraCeuticals

HERBAL RANGE

A new and innovative practitioner-only herbal medicine range, providing a strong combination of science, innovation and tradition.

BioCeuticals herbal range uses synergistic nutrients combined with our chosen herbs to provide formulations that get results.

Our new range is stamped with our herbal logo guaranteeing:
- Quality
- Sustainability
- Clinically trialled and proven herbal ingredients
- Standardised extracts

The BioCeuticals® Herbal Range is formulated using the latest research, best available ingredients, therapeutic doses, and sourced from quality and sustainable herbal material.

Call 1300 650 455 to order now or for more information.
www.bioceuticals.com.au
Reviews of medical journal articles

Tessa Finney-Brown

These abstracts are brief summaries of articles in recent issues of medical journals. Articles selected are of a general nature for the information of practitioners of herbal medicine. A dominant theme is often present throughout the journals which will be reflected in the reviews.

Acupuncture interventions for cancer related fatigue


Cancer patients often seek adjuvant care from holistic practitioners, including naturopaths, herbalists and nutritionists. Fatigue is one of the most common side effects of cancer treatments and, indeed, of cancer itself, and is often a presenting concern. Up to 99% of cancer patients are said to experience some level of fatigue during their treatment and this may lead to chronic fatigue. Given conflicting advice and studies, it can sometimes be a challenge for complementary therapists to provide the best evidence-based care. A new study published in the Journal of Clinical Oncology provides some guidance on what may be a less controversial referral for herbalists to make in the multi-modality care of a patient with cancer.

This study was a randomised, multi-centred controlled trial which compared the efficacy of acupuncture vs. usual care for treating breast cancer patients (stage I to stage IIIA) who were suffering with fatigue. 302 patients were enrolled in the study and randomised into two groups on a 1:3 (usual care: acupuncture) basis. The usual care group received a booklet with information about fatigue and its management whilst the acupuncture group received 6 weeks of weekly acupuncture treatment (needing 3 pairs of acupoints). The participants in the intervention arm also received the usual care.

The primary outcome measure was general fatigue at 6 weeks assessed with the multidimensional fatigue inventory (MFI), along with the Hospital Anxiety and Depression Scale and Functional Assessment of Cancer therapy – General Quality-of-Life Scale.

After the intervention period, those who had received acupuncture experienced significantly less fatigue, with the difference in general fatigue score between the groups being -3.11 (95% CI: -3.97 to -2.25; P<0.001). Both mental and physical fatigue were improved, along with all other aspects of fatigue measured on the MFI. There were also significant improvements in secondary outcome measures of anxiety and depression and quality of life. Acupuncture participants rated themselves as having much higher levels of physical, functional, emotional and social function well-being in comparison to the self-rating of those receiving the usual treatment.

The conclusion of study authors was that acupuncture was an effective intervention for managing symptoms of cancer-related fatigue and improving quality of life in those suffering from breast cancer. This makes it an intervention to consider in the multi-modality care of a client suffering from cancer-related fatigue, anxiety or depression, or wishing to improve their quality of life.

DHA supplementation and pregnancy outcomes


Omega 3 long chain polyunsaturated fatty acids (LCPUFAs) are a commonly prescribed supplement. Docosahexanoic acid (DHA) is considered to be of particular importance in pregnancy as it is necessary for the developing foetal nervous system. LCPUFAs have been shown in observational studies to improve pregnancy outcomes such as gestation duration and infant growth. They are also believed to enhance long- and short-term growth of the infant.

Although many recent trials have examined DHA supplementation in pregnant women, they have produced mixed results. This current study adds to the body of knowledge in the area.

Researchers enrolled 350 American women in the study over two and a half years. They randomised these into two groups – an intervention arm and a placebo arm. The intervention group were given 3 capsules/d of a marine algae oil source of DHA (200 mg DHA/capsule) from enrolment until birth, whereas those in the placebo group received 3 capsules/d containing half soybean and half corn oil. The placebo capsules were not really inert as they did not contain DHA but did contain a-linolenic acid—a precursor of DHA.

After completion of the study, results demonstrated that DHA supplementation produced a significant increase in maternal and cord RBC-phospholipid-DHA from enrolment. This increase was only seen in the intervention arm. In this group, gestational age was also 2.87 days greater and birth weight and length were higher but did not reach statistical significance.

Researchers concluded that these supplements may be useful in helping to prevent pre-term birth and low birth weights. Limitations of the study included the fact that other sources of DHA intake were not controlled and that the placebo capsule was not inert.
Effects of dietary fat type on mood, resting energy expenditure and daily physical activity


Increasing rates of obesity and associated health problems such as type 2 diabetes mellitus are a worrying trend worldwide, particularly in westernised countries. Because of this, much public health funding is being invested in research and health promotion campaigns aimed at helping people attain and maintain healthy weights. It is thus very important to understand which interventions work in combating obesity and what recommendations should be made. While some data suggests that excessive energy intake, not decreased energy expenditure, is the principle cause of the obesity epidemic, other research suggests that and low resting energy expenditure (REE) or sedentary behaviour is just as important to address.

In this study two cohorts of young adults were enrolled in separate randomised, double-blinded crossover trials that compared a 3 week high palmitic acid diet (HPA - similar to the Western diet fat composition) to a low-palmitic and high-oleic acid diet (HOA - similar to the Mediterranean diet fat composition). As primary outcome measures, the cohorts were assessed for their physical activity levels (monitored continuously by accelerometry) and resting energy expenditure (REE). Researchers also administered the Profile of Mood States (POMS) in one of the cohorts in order to gain insight into potential mood disturbances that may affect physical activity and REE.

Results indicated that physical activity levels and resting energy expenditure were both higher in the HOA diet group. Resting energy expenditure changes were between 3 and 4.5%. In addition, it seemed that the anger-hostility score was significantly higher during the HPA diet period.

Thus, overall, the replacement of dietary HPA with HOA over a three week period was associated with increased physical activity and REE and less anger. Changes in REE were presumed to be due to effects on mitochondrial function. Changes in dietary fat balance may be useful adjunctive treatments in weight loss programs.

Investigation of the links between high and low fat dairy food and breast cancer


There have been a number of studies in the past designed to evaluate whether dairy intake is correlated with breast cancer, with equivocal results. There is some evidence that associations vary by levels of fat in the dairy itself. This may be because dietary fat is a source of oestrogenic hormones and may be related to worse breast cancer survival. Dairy fat in particular has been found in some studies to be linked to higher levels of oestradiol and free oestradiol in serum. Hypotheses have been advanced, linking this to higher oestrogen and progesterone in the milk as most production in today’s industry comes from pregnant cows. Increased production has also been facilitated by genetic modification of cattle and feed alterations. This milk is quite different to that produced in traditional herding societies.

The researchers in the current study attempted to more precisely elucidate the relationship between dairy and breast cancer by evaluating associations between high- and low-fat dairy intake and recurrence rates and mortality after breast cancer diagnosis.

They used data from the Life After Cancer Epidemiological study and included 1893 women diagnosed with early-stage invasive breast cancer from 1997 to 2000. Of these women 349 had a recurrence and 189 died from breast cancer over a median follow-up period of 11.8 years. Dietary intake was assessed via the Fred Hutchinson Cancer Research Centre Food Frequency Questionnaire (FHCRC-FFQ) at the baseline and 6-year follow-up surveys. Specifically, women were asked how often they consumed dairy foods during the previous year. The portion size of a medium serving was provided and women were asked whether they consumed a small, medium or large serving. Dairy products included milk (milk on cereal; milk not on cereal; milk, cream or creamer in coffee or tea), cheese (low-fat cottage cheese; non-fat cheese; part skim or reduced-fat cheese; other cheese), dairy desserts (ice cream; pudding; custard or flan; low-fat or non-fat frozen desserts), and yoghurt (non-fat; other). Women were also asked about the fat content of their dairy choices.

Overall, women who consumed the greatest amount of high fat dairy had higher levels of physical activity, lower alcohol intake, higher BMI and were more likely to have never smoked. They also had higher fibre and red meat intake. Some of these are protective factors against breast cancer, which may be important.

In minimally and multivariable adjusted analyses, high fat dairy intake was positively correlated to mortality outcomes. Those consuming greater amounts of high fat dairy had higher breast cancer mortality and higher all-cause mortality. There was a suggestion of increased recurrence with 1 or more daily servings of high fat dairy but this was not statistically significant. In contrast, low-fat dairy consumption was not associated with outcomes in multivariate adjusted analyses. There was no overall association between dairy intake and recurrence or breast cancer-specific survival.

For practitioners it may be useful to look at the type of
dairy consumed by clients with breast cancer diagnoses or risk factors. Dairy foods have also been positively associated with other conditions including prostate, ovarian and post-menopausal endometrial cancer. This research may potentially be relevant to groups of people with those diseases also.

**Palaeolithic diet patterns alter ectopic fat deposition**


Researchers have been elucidating a number of links between abdominal obesity, insulin resistance and cardiovascular disease over the past decade. Ectopic fat accumulation in liver and skeletal muscle is one factor which may be an essential link between these conditions developing in women after menopause, a time in which there is a redistribution of fat from peripheral to central deposits. For this reason, interventions which reduce or modify such fat deposition may help to improve insulin sensitivity and decrease cardiovascular risk.

The Palaeolithic diet is one which has been receiving a lot of attention lately. There are many permutations of this way of eating, but most emphasise eating vegetables, eggs, meats and fruits and avoiding Neolithic foods such as grains and legumes. These diets tend to be higher in protein and fats (including saturated fat), and lower in carbohydrates than the standard western diet.

In this study, researchers hypothesised that a diet containing relatively high amounts of protein and unsaturated fat, mainly monounsaturated fatty acids (MUFA’s), but limited carbohydrates and saturated fat, would reduce lipid content in liver and muscle and increase insulin sensitivity in postmenopausal women. (NB. This is a modified style of Palaeolithic diet as most forms do not limit saturated fat intake.)

The researchers enrolled ten healthy postmenopausal Swedish women with a BMI of >27 (mean: 31.3) and instructed them to consume an ad libitum (ad lib) Palaeolithic-style of diet that supplied about 30% protein, 40% fat (mainly MUFA’s) and 30% carbohydrate (percentages based on energy supplied, not grams of macronutrient). The women also consumed 40g of nuts (almond and walnuts) a day. The diet included lean meat, fish, fruit, vegetables (including root vegetables), eggs and nuts. Dairy products, cereals, beans, refined fats and sugar, added salt, bakery products and soft drinks were excluded.

At baseline, and after 5 weeks of dietary change, the levels of intramyocellular lipid (IMCL) in calf muscles and liver triglyceride levels were quantified via proton magnetic resonance spectroscopy (1H-MRS). Insulin sensitivity was also assessed using homoeostasis model assessment (HOMA) indices and the euglycaemic hyperinsulinaemic clamp technique.

After 5 weeks eating a Palaeolithic-type diet, even with an ad lib approach, overall energy consumption by the group dropped by 4.5%. There were also significant reductions in:
- Body weight
- BMI
- Waist and hip circumference and waist:hip ratio
- Abdominal sagittal diameter
- Systolic and diastolic blood pressure and (average drop of 7mm/Hg) resting heart rate (not significant).

The women also slightly (not significantly) increased their physical activity-related energy expenditure, although they were not instructed to do so.

In terms of the primary outcome measures, levels of fasting serum glucose, cholesterol, triglycerides, LDL/HDL cholesterol, apolipoprotein B (apoB) and apolipoprotein A1 (apoA1), urinary C-peptide and HOMA indices were all reduced. Liver triglyceride levels decreased by 49%. Whole body insulin sensitivity did not change significantly and neither did IMCL levels in skeletal muscle.

Given the significant changes in liver triglyceride content, body composition measures and many other biochemical indices of cardiovascular and DM risk, researchers concluded that a modified Palaeolithic-type diet has strong and tissue-specific effects on ectopic lipid deposition in postmenopausal women. Practitioners may wish to consider this type of dietary modification in clients with abdominal obesity, or with risk factors for non-alcoholic fatty liver disease, diabetes mellitus or cardiovascular disease (such as high blood pressure).

**Vitamin D and the association with diabetes in high risk Asian subjects**


Diabetes mellitus is a growing health concern worldwide. Previously thought to be a disease confined to countries living ‘Western’ lifestyles, diabetes is now a lot more widespread and impacting many different ethnic communities. Cross sectional studies have found that 25-hydroxyvitamin D - 25(OH)D - is lower in those with type 2 diabetes mellitus (DM), and also in those with an impaired glucose tolerance. Vitamin D deficiency is common in Asian populations while the diabetes burden is increasing, which makes them of special interest when investigating this relationship.

This study recruited 1080 non-diabetic Korean subjects based on the presence of one or more risk factors for type 2 DM, including obesity, hypertension, dyslipidaemia and/or family history of type 2 DM. Participants were assessed 6 monthly for up to five years on makers of fasting plasma glucose, HbA1c and lipid concentrations.
In addition, the primary end point was the development of type 2 DM.

At the conclusion of the study, results showed that 10.5% of subjects had a serum 25(OH)D deficiency (≤10 ng/mL), 51.6% had an insufficiency (10.1 – 19.9 ng/mL) and 38% had sufficient levels (≥20 ng/mL). In these groups those with vitamin D deficiency were more likely to have developed DM after 5 years (15.9%, 10.2% and 5.4% respectively). After adjustment this relationship held independently of BMI, HOMA2-IR (a measure of insulin resistance) and insulinogetic index.

This prospective study suggests that in high-risk Asian subjects, vitamin D metabolism may play a role in type 2 DM pathogenesis, independent of known risk factors. It expands the body of knowledge linking the two factors, and suggests a potential role for vitamin D supplementation in the prevention of DM.

**High protein breakfasts and the neural and hormonal urge to eat**


Rates of obesity continue to increase in Australian society and are a concerning health issue across many age groups. Adolescents in particular have an increased risk of developing chronic conditions early in life that will then affect them adversely on a number of levels. Studies have associated a number of key factors in the aetiology of this disease (obesity), one of which is the habit of skipping breakfast. This nutritional pattern is strongly associated with an increased prevalence of weight gain, increased BMI and obesity.

- dEating a 350 kcal cereal-based breakfast (13g of protein) (LP – low protein)
- Eating a 350 kcal egg- and beef-rich breakfast (35g of protein) (HP – high protein)
- Continuing to skip breakfast.

There was a wash-out of seven days between each weekly diet change.

On day 7 of each week, the subjects participated in a 10 hr testing day that consisted of appetite and satiety questionnaires, blood sampling, pre-dinner cue-stimulated functional magnetic resonance imaging (MRI) of the brain and ad libitum dinner and evening snacks.

In comparison with skipping breakfast (BS), both meals reduced daily hunger with no difference between the two meal patterns. Breakfast generally increased daily fullness, with the HP breakfast performing better than the LP breakfast. HP meals (but not LP) reduce daily ghrelin (an appetite-related hormone) and increased daily peptide YY (appetite-reducing hormone) concentrations compared with BS.

Both meals reduced pre-dinner amygdala, hippocampal and mid-frontal corticolimbic activation compared with BS. HP but not LP reduced evening snacking of high-fat foods compared with BS.

The overall take home message is that any breakfast, high- or low-protein, leads to beneficial alterations in behavioural, neural and hormonal feeding behaviours in the overweight adolescents. However, the higher protein meal was superior in terms of increasing post-meal satiety and reducing evening high-fat snacking (although no significant different in overall calorie intake was seen). Diets rich in protein are gaining evidence as interventions to help reduce weight or prevent weight gain in adults and this study suggests that they are also beneficial in younger age groups. The main reason that most of the study participants gave for not eating breakfast was that there was not enough time in the morning (would rather sleep). Thus, practitioners should pay attention not only to the recommendation to eat higher protein breakfasts but also to providing realistic ways for clients to incorporate this into their lives.

**Vitamin E as a biomarker for Alzheimer’s disease**


Vitamin E is the main lipid-soluble chain-breaking, non-enzymatic antioxidant functioning in the human body and previous studies have shown it to be essential for normal neurological function. There are eight natural congeners of Vitamin E – four tocopherols and four tocotrienols, all of which show different biological properties that may be relevant for neuroprotection. These include antioxidant and anti-inflammatory properties as well as direct modulation of signalling pathways relevant for neurodegeneration. With neurodegenerative conditions, especially Alzheimer’s disease (AD), there is a growing need for biomarkers to assist with early prognosis and treatment monitoring.

In this particular study European researchers set out to evaluate the accuracy of combined structural magnetic resonance imaging (MRI) and measures of plasma vitamin E forms in differentiating individuals with AD and those with mild cognitive impairment (MCI) from subjects who were cognitively intact (CTL).

Patients in the study already had diagnoses and researchers enrolled 81 patients with AD, 86 with MCI and 86 CTL individuals. These were selected from a larger multicentre study group. MRI and plasma Vitamin E levels were acquired at baseline and then a multivariate data analysis technique was used to analyse the measures...
in relation to AD and MCI diagnosis. Patients were also followed up a year later to assess conversion of individuals with MCI to clinical AD.

The researchers found that plasma tocopherol and tocotrienol levels, in combination with automated MRI measurements can accurately help to differentiate MCI from AD patients, and to prospectively predict MCI conversion into AD. Both patients with MCI and AD had lower levels of plasma vitamin E than CTL subjects and the difference between AD and CTL patients was statistically significant for all but α- and β- tocopherol. α- and γ-tocotrienol, in addition to γ-tocopherol, appeared to be the most important forms of vitamin E in differentiating AD and MCI cases from controls. In addition, both MCI and AD patients had higher levels of plasma indices of vitamin E oxidative/nitrosative damage. Whilst there were no differences in plasma vitamin E levels between MCI convertors (to AD) and non-converters, when combined with MRI prognostic information was able to be attained.

The relevance of this study to herbalists and natural medicine practitioners is not in the ability to diagnose or predict conversion to AD. Rather it lies in the link between antioxidant nutrients (mainly vitamin E) and cognitive decline. This suggests that perhaps it is an important nutrient to be aware of in clients’ diets and supplement regimes in order to prevent the development or worsening of AD and cognitive decline.

The NHAA invites contributions to the Australian Journal of Herbal Medicine

- Feature articles, case histories, evidence based practice, growing, reviews and more
- Set topics
- Style proforma available
- Published articles may be paid

Share your clinical experience
Be part of your professional publication

For details contact the Editor on editorajhm@nhaa.org.au or telephone (02) 8765 0071, fax (02) 8765 0091, www.nhaa.org.au

© National Herbalists Association of Australia 2013

by Bone and Mills

Reviewed by Dr Stuart Glastonbury
MMBS BSc(Med) DipWHM
Toowoomba, Queensland, Australia.
Email s.glastonbury@optusnet.com.au

With a sense of humor, Simon Mills pointed out at the release of Principles and Practice of Phytotherapy, 2nd edition (PPP E2), that one significant change is that it is now “Bone and Mills”.

“This should remove any confusion with the other well-known duo authors of romantic literature, Mills and Boon”, he joked.

It was a pleasure to have Simon Mills in Australia for the NHAA international conference and release of PPP E2. Herbalists around the world will be thankful and privileged to have an update of the original edition. Kerry Bone and Simon Mills remain two of the most well-known and respected herbal medicine researchers and clinicians of International reputation and we are all blessed to have this contemporary contribution to the knowledge and evidence base of herbal medicine.

Most herbal medicine practitioners would agree that the first edition of ‘Principles and Practice of Phytotherapy’ (2000) was an essential text for all students and practitioners who use herbal medicines as a therapeutic tool. Warmly referred to as ‘PPP’ or ‘Mills and Bone’, we have long awaited this new updated edition. Many aspects of PPP E2 remain true to the first edition; however, there are also some significant updates with regard to both the pre-clinical/scientific knowledge and the clinical application of herbal medicine.

Part 2 is fully updated from the original edition, yet retains the focus on the practical application of herbal medicine. This section addresses the important aspects of dosage and dosage forms, a systematic approach to herbal prescribing, pathological states and system dysfunctions. These are key concepts and essential knowledge for the successful application of herbal medicine in clinical practice. Students will find this section particularly useful, as case examples and the wealth of clinical experience of the authors will help build confidence and guide new practitioners towards appropriate clinical reasoning and prescribing. Common clinical presentations are covered such as: fever, infectious disease, inflammatory and auto-immune disease, fatigue, debility and malignant disease. Each chapter is fully referenced and contains useful case histories and gives examples of liquid herbal formulations.

Chapter 9 is a key chapter, as it was in the first edition, as this chapter reviews herbal approaches to system dysfunction. Each body system is systematically reviewed with inclusion of basic medical sciences such as anatomy and physiology and relevant biochemistry. This is followed by a structured and rational approach to key actions and herbs that are useful for the management of common clinical presentations relevant to the system being covered. Traditional use and indications are retained, as are important contra-indications or cautions to particular herbs in certain situations or conditions. Case histories are again used in this chapter to help guide therapeutic decision-making and include examples of liquid herbal formulas.

Part 3 of the text begins an extensive and up-to-date *materia medica* of fifty commonly used medicinal herbs relevant to Australian clinical practice. The classic PPP format is utilized for each *materia medica*, which begins with: synonyms, effects, traditional view, summary of actions both from a traditional viewpoint and those supported by modern clinical trials.

This is followed by the important ‘technical data section’ which covers in depth the evidence for the use of the particular herb to achieve various clinical outcomes. This section utilizes the authors’ combined experience in research by critically evaluating the modern clinical trial evidence and its application in evidence-based practice. Each *material medica* is concluded with essential information on toxicology and safety, contraindications, interactions and use in special groups such as pregnancy, lactation and paediatrics.

In summary, this fully updated 2nd edition of PPP remains an essential herbal medicine text that builds on the success of the first edition released in 2000. This text, whilst being internationally relevant, has a particular place for the practice of herbal medicine within the Australian context. The foreword by Mark Blumenthal acknowledges the global importance and impact of this text. This is a key resource for naturopathic and herbal medicine students through to experienced herbal clinicians as well as allied health and integrative medicine practitioners wanting to know more about the principles and practice of phytotherapy.
AJHM based CPE Questionnaire

The AJHM based CPE questionnaire system is a voluntary system designed to assist members in the accumulation of NHAA CPE points. Questions are divided into the appropriate subject categories (herbal medicine and medical science) and each question refers to an article in this issue of the Australian Journal of Herbal Medicine. Points accumulated through completion of these questions should be recorded in the NHAA CPE diary. Each completed question is worth one mark in the relevant category. Your completed CPE diary should be returned with your membership renewal at the end of the financial year. For further information please see the NHAA CPE Member’s Manual on the NHAA website www.nhaa.org.au.

Herbal medicine questions – AJHM 25(2)

1. Which of the following is the most correct?
   a) It is impossible to improve the outcomes of coronary heart disease through diet.
   b) Increasing intake of green leafy vegetables may be preventative for myocardial infarction in middle aged and young women.
   c) Increasing intake of fatty fish works to prevent the development of coronary heart disease.
   d) Increasing intake of anthocyanin-rich foods may help to reduce the risk of myocardial infarction in young and middle-aged women.

2. Consumption of green tea catechins with or without caffeine was associated with decreases in fasting blood glucose.
   a) Consumption of green tea catechins is only effective at reducing blood glucose if caffeine is also present.
   b) Consumption of green tea catechins decreases blood glucose and fasting blood insulin.
   c) Consumption of green tea catechins decreases fasting blood insulin but not fasting blood glucose.
   d) Consumption of green tea as a drink is not as effective as taking supplements.

3. Pre-diagnosis, consumption of:
   a) Fermented soy foods, but not other types, was linked to a lower risk of lung cancer.
   b) Any type of soy food was associated with a worse survival in female breast cancer sufferers.
   c) Any type of soy food was associated with a worse survival in female lung cancer sufferers.
   d) Any type of soy food was associated with a better survival in female lung cancer sufferers.

4. Which of the following is most correct?
   a) α-santalol is the only active constituent of sandalwood oil.
   b) Superoxide dismutase (SOD) is a powerful anti-diabetic.
   c) Sandalwood oil is used traditionally as an antiseptic.
   d) The glibenclamide-treated group were the only ones to show improved blood glucose levels.

Medical science questions – AJHM 25(2)

1. According to the article on acupuncture for cancer-related fatigue, Acupuncture significantly improved
   a) Mood but not energy levels in breast cancer patients.
   b) Mental but not physical aspects of fatigue in breast cancer patients.
   c) All aspects of fatigue in breast cancer patients.
   d) Fatigue but lowered overall assessment of quality of life in breast cancer patients.

2. From the article of DHA supplementation, which of the following is the most correct?
   a) DHA supplements have no effect on pregnancy outcomes.
   b) DHA supplements cannot be adequately assessed in trials which use inert placebos.
   c) DHA supplements contribute to increased foetal IQ.
   d) DHA supplements may result in an increase in neonatal birth weight and length.

3. From the information given above, which of the following is the most correct?
   a) Increased levels of fat (any type) in the diet are associated with increased weight gain in young adults.
   b) Increased levels of saturated fat in the diet are associated with weight loss in young adults.
   c) Replacement of dietary palmitic acid with oleic acid is associated with increased physical activity and less anger in young adults.
   d) Increased levels of fish in the diet are associated with decreased anger in young adults.

4. Referring to the article on high protein breakfasts in adolescence, which is the most correct?
   a) Teenage girls in the study ate less high-fat food after dinner on days when they consumed a high-protein breakfast.
   b) Teenage girls in the study ate less food overall on days when they consumed a high-carb breakfast.
   c) Teenage girls in the study ate less food overall on days when they consumed a high-protein breakfast.
   d) Teenage girls in the study ate less food after dinner on days when they consumed a high-protein breakfast.
The NHAA invites contributions to the Australian Journal of Herbal Medicine

The Australian Journal of Herbal Medicine publishes material on all aspects of western herbal medicine with emphasis on the philosophy of herbal medicine and the phytochemistry, pharmacology and clinical applications of medicinal plants.

Editorial policy
- Subject material must relate to herbal medicine.
- Accepted articles become the property of the Australian Journal of Herbal Medicine.
- Contributions are subject to peer review and editing.
- Contributions to the Australian Journal of Herbal Medicine must not be submitted elsewhere.

Peer review
- All feature articles will be reviewed by two independent peer reviewers.
- Reviewed articles will be returned to the author for modification if required.

Contribution requirements
- Files should be saved as Word for Windows or equivalent and should be sent electronically by email as a complete version or by post with an original printed version and an electronic copy on CD or USB stick. All figures and pictures must be saved as a high resolution .pdf, .jpg or .tif file.
- All statements must be referenced and a full reference list must be included. If the statement is the author’s observation or opinion this should be made clear.
- All statements should be of a professional nature and exclude any inflammatory, derogatory, racist or other inappropriate style of writing.
- Papers should be no more than 5000 words including tables and references. The number of references should not exceed 30 (except for review articles).
- An abstract of the article should be included.
- A brief profile of the author should be included.

Referencing
- Text citation should appear as surname of first author and year of publication in parentheses at the end of a statement or paragraph such as (Cowper 2007).
- The reference list should be arranged in alphabetical order using the following format:

Advertising
- Full page, half page and quarter page advertisements can be accepted for the Journal.
- Mailing inserts can be accepted for national, state or select membership distribution.
- Smaller advertisements and personal classified advertising may be published through the NHAA enewsletter.

For advertising rates and sizes contact the NHAA office on telephone (02) 8765 0071, fax (02) 8765 0091 email nhaa@nhaa.org.au or visit www.nhaa.org.au / Publications and Products / AJHM

© NHAA 2013. All rights reserved. No part of this publication may be reproduced or utilised in any form whatsoever without prior written permission from the NHAA. All advertising is solely intended for the information of members and is not endorsed by the NHAA. The NHAA reserves the right to determine journal content. The views in this publication are those of the authors and may not reflect the view of the NHAA. The NHAA does not have the resources to verify the information in this publication and accepts no responsibility whatsoever for the application in whatever form of information contained in this publication.
Editorial  ................................................................. 49
Jane Frawley

Letters to the editor ...................................................... 51

Commentary
Providing leadership in complementary medicine research: Introducing the Australian Research
Centre in Complementary and Integrative Medicine (ARCCIM), Faculty of Health, University of
Technology Sydney .................................................. 54
Jon Adams

Articles
Patterns of inter-professional communication between complementary and conventional
practitioners providing maternity care services: a preliminary examination of the perceptions of
CAM practitioner .................................................. 57
Amie Steel, Helene Diezel, Jon Wardle, Kate Johnston

Importance of Himalayan medicinal plants and their conservation strategies .................. 63
Shugufa Parveen, Ulfat Jan, Azra Kamili

Herbal medicine hypothesis
Eosinophilic oesophagitis (EoE): hypothetical herbal interventions for a rare and emerging
gastrointestinal disorder ........................................... 68
Amie Steel, Helene Diezel, Jon Wardle, Kate Johnston

Global dispensary
Ulcer protective effect of hydroalcoholic extract of Bergia suffruticosa in rats .................. 74
Sandeep Kumar Thakur, Nirav M. Ravat, Mehul N. Jivrajani, Ranjeet Prasad Dash, Sheetal Anandjiwala,
Manish Nivsarkar

Case study
Bilateral pitting oedema with multiple aetiologies ....................................................... 79
Sophie Atkin

Erratum ........................................................................ 79

Medplant
Berries for heart health ................................................. 85
Chamomile may exert antidepressant activity ................................................................. 85
Achillea millefolium may decrease bleeding tendency in patients with chronic kidney disease .... 86
Green tea catechins and their impact upon glycaemic control ........................................ 86
Nigella sativa is beneficial in treatment of hyperlipidaemia ............................................. 87
Pre-diagnosis soy consumption and lung cancer survival .............................................. 87
Hypoglycaemic and antioxidant potential of sandalwood ............................................. 88

Medjourn
Acupuncture interventions for cancer related fatigue ..................................................... 90
DHA supplementation and pregnancy outcomes .......................................................... 90
Effects of dietary fat type on mood, resting energy expenditure and daily physical activity .... 91
Investigation of the links between high and low fat dairy food and breast cancer .............. 91
Palaeolithic diet patterns alter ectopic fat deposition .................................................... 92
Vitamin D and the association with diabetes in high risk Asian subjects ......................... 92
High protein breakfasts and the neural and hormonal urge to eat ................................... 93
Vitamin E as a biomarker for Alzheimer’s disease ........................................................ 93

Book review
Principles and Practice of Phytotherapy: Modern Herbal Medicine. 2nd Edition ............ 95
Kerry Bone and Simon Mills

AJHM based CPE questionnaire ................................................ 96