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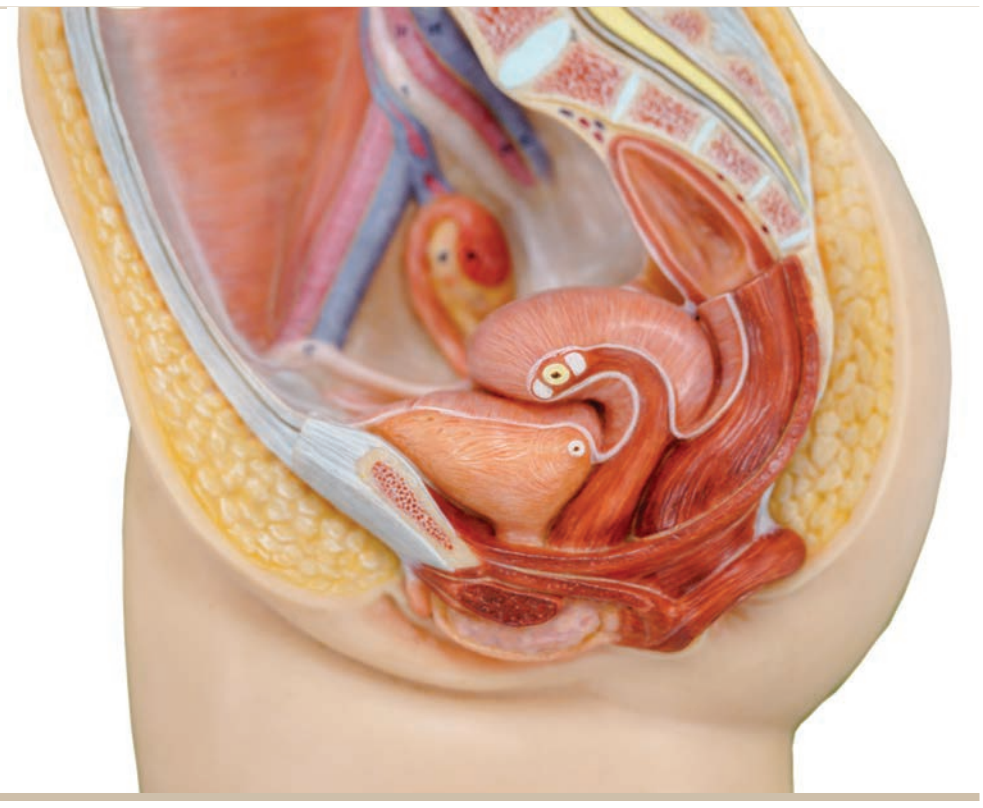
Vis Medicatrix Naturae

Probiotics

Key Players in Female Genitourinary Tract Health

DONALD BROWN, ND



Over the past several years, there have been large projects collecting data to examine the role that the human microbiota plays in health and disease.[1,2] One of the primary areas of focus has been the role that microbial communities play in the health of the female genitourinary tract. The Vaginal Microbiome Consortium at Virginia Commonwealth University is a 2-stage project funded by the National Institutes of Health; it involves collecting vaginal samples from over 6000 women 18 years and older in the first stage, and samples from 2000 pregnant women in the second stage.[3] The objective of the latter study is to elucidate the role(s) that the vaginal microbiota plays in the etiology

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The Vaginal Microbiome

Investigations Point to a New "Normal"

KEEGAN SHERIDAN, ND

How the human microbiome coexists with the body is still an unknown in many ways, and yet, even our early understanding of this symbiotic relationship is highly compelling. While research to date has largely focused on microbiota of the gut, this work is rapidly expanding to other areas of the body. For example, new research demonstrates the powerful roles that the vaginal microbiome plays. Thanks to targeted investigations in this area, we are quickly deepening our understanding of what constitutes "normal" vaginal flora, common factors that have the power to disrupt healthy microbial balance, and meaningful tools to positively influence this important microbial community. This article provides an update on research engines driving discoveries of the vaginal microbiome as well as clinical applications to consider.

Our understanding of what constitutes "normal" in the microbial makeup of the vagina and surrounding genitourinary tissues has shifted dramatically in recent years.

The Human Microbiome Project

In 2008, the National Institutes of Health (NIH) Common Fund Human Microbiome Project (HMP) was established. Its mission was "generating resources that would enable the comprehensive characterization of the human microbiome and analysis of its role in human health and disease."[1] As part of its initial phase, investigations were divided into 5 sites: oral and nasal cavities, the gastrointestinal and genitourinary tracts, and the skin. The next phase, currently underway, is the Integrative HMP (iHMP). Building upon the first phase, the iHMP strives to integrate "longitudinal datasets from

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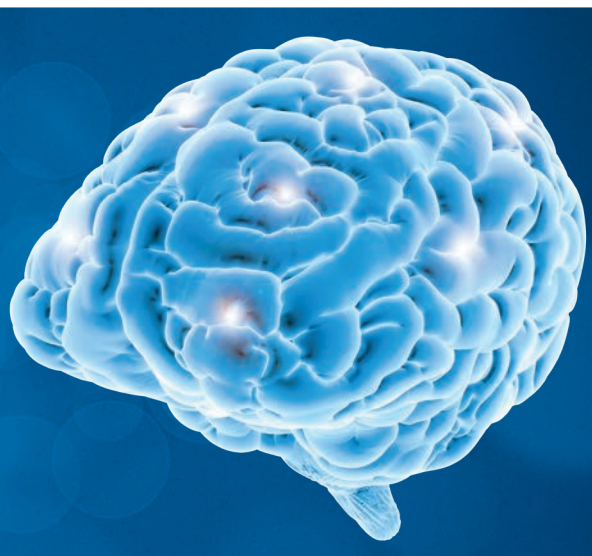

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of adverse outcomes of pregnancy and, more specifically, preterm birth.

Normal Vaginal Microbiota & Function

While the gastrointestinal (GI) tract harbors an estimated 500 different microbial species, the number of species inhabiting the vagina is thought to be approximately 50.[4] Vaginal eubiosis is characterized by the presence of beneficial lactic-acid-producing microbes that are largely dominated by the genus *Lactobacillus*; these typically make up 90-95% of the total bacterial count in the genitourinary tract.[5] The vaginal microbiota during eubiosis in reproductive-age women is typically dominated by *Lactobacillus crispatus*, *L gasseri*, *L iners*, and *L jensenii*, most of which produce large amounts of lactic acid.[6] Other species identified have included *L acidophilus*, *L rhamnosus*, *L plantarum*, *L fermentum*, *L brevis*, *L casei*, *L vaginalis*, *L delbruekii*, *L salivarius*, and *L reuteri*.[7] In contrast, vaginal dysbiosis is characterized by the presence of polymicrobial populations with either a modest lactobacilli load (intermediate microbiota) or no lactobacilli (bacterial vaginosis [BV]).[8] In short, compared to the GI tract, healthy vaginal flora is less diverse.

Lactobacillus species in the vagina contribute a number of health promoting and protective factors in women. These include:

- Production of lactic acid, which is primarily responsible for acidification, thus serving as a antimicrobial factor.[9] *L crispatus*, on average, produces the highest amount of lactic acid.[6]
- Competitive inhibition of binding of pathogenic bacteria, including those responsible for yeast vaginitis, bacterial vaginosis, urinary tract infections, and sexually transmitted infections[10-14]
- Disruption of the formation of uropathogen-related biofilms, 15 of which protect pathogens and enable colonization of normal flora such as *Candida* spp[16]
- Regulation of vaginal epithelial cell innate immunity[17]

A strain of *L acidophilus* has also been found to reduce fecal beta-glucuronidase levels and activity and support healthy estrogen metabolism.[18] While many Lactobacillus probiotics for women's health have been chosen based on production of hydrogen peroxide (H_2O_2), recent studies suggest that in the hypoxic conditions of the vagina, concentrations of H_2O_2 do not achieve levels that would be antimicrobial.[19]

Many factors influence the stability and population of the vaginal microbiota. The composition of vaginal communities fluctuates as a function of age, menarche, menses, pregnancy, infections, birth control, and sexual behaviors.[20] Exposure to spermicides or β-lactam or other antimicrobials can decrease the prevalence of lactobacilli and consequently increase susceptibility to genitourinary tract infections.[21]

Probiotics & Genitourinary Tract Health

Probiotics are defined as living organisms administered to promote the health of the host. Specifically, a recent revision to the original FAO/WHO workshop defined probiotics as "live microorganisms that, when administered in adequate amounts, confer a health benefit on the host."[22] Most of the scientific and clinical research with probiotics has focused on oral use of probiotics for gastrointestinal and immune health. The primary genera that have been studied are *Lactobacillus* and *Bifidobacterium* species.

Many of the initial studies looking at the potential benefits of probiotics for female genitourinary tract health focused on the intravaginal application of lactobacilli strains. There has been an emerging trend, however, of using oral probiotics to colonize the vagina, backed by a substantial amount of clinical research. Numerous trials have demonstrated that oral administration of specific strains of lactobacilli – in particular, *L crispatus*, *L rhamnosus*, *L gasseri*, and *L reuteri* – can both maintain and restore healthy genitourinary microbiota in females.[23-25] A recent study found that oral supplementation with *L acidophilus* and *L rhamnosus* in women with intermediate vaginal microbiota (having only modest levels of *Lactobacillus* spp) led to significant vaginal colonization of both strains and a restoration of normal Nugent scores.[26]

There has been an emerging trend of using oral probiotics to colonize the vagina, backed by a substantial amount of clinical research.

Vaginal & Urinary Tract Infections

Bacterial Vaginosis

Bacterial vaginosis (BV) is a common vaginal infection causing significant gynecological and obstetric morbidity. Though no single pathogen has been identified as the causative agent of BV, *Gardnerella vaginalis* and *Atopobium vaginae* are commonly associated with the condition.[27] Typical symptoms may include vaginal malodor, itching, dysuria, and a thin discharge, but a substantial number of women with BV are also asymptomatic.[28] BV has been associated with pelvic inflammatory disease, infections following gynecological surgery, and preterm birth.[29] Estimates suggest that 40% of cases of spontaneous preterm labor and preterm birth maybe associated with BV.[30]

Two randomized, double-blind, placebo-controlled trials (RDBPCT) have shown that the addition of probiotics to standard treatment of BV (metronidazole and tinidazole) improve the eradication of BV symptoms.[31,32] Both trials used a combination of *L rhamnosus* and *L reuteri* (1 billion CFU/day of each strain) both during and after standard treatment for BV, collectively resulting in the use of probiotics for 28 days in the first trial and 30 days in the second. In both studies, there was a significantly higher "cure" rate in women taking the oral probiotic combination compared to the placebo group. In the first trial, high counts of *Lactobacillus* species were also recovered from the vagina of women treated with the oral probiotic combination.[31]

Vulvovaginal Candidiasis

Vulvovaginal candidiasis (VVC) is most commonly associated with *Candida albicans* and *C glabrata*.[33] While the clinical data on the use of probiotics is not as robust as that for BV, there are a couple of interesting studies.

In one RDBPCT, researchers explored whether probiotics could reduce the risk of recurrence of VVC after a standard course of treatment with fluconazole.[34] After initial treatment with a single dose of oral fluconazole, 59 VVC patients took either an oral probiotic supplement (containing a combination of 7.5 billion CFU of *L acidophilus*, 6 billion CFU of *Bifidobacterium bifidum*, and 1.5 billion CFU of *B longum*) or placebo capsules daily for 6 months. Of the women taking placebo capsules, 35.5% experienced recurrence of VVC; of the women taking probiotics, only 7.2% experienced recurrence. Another RDBPCT found that oral use of *L rhamnosus* and *L reuteri* (1 billion CFU/day of each strain) led to better outcomes in women taking fluconazole for VVC.[35]

Urinary Tract Infections

Approximately 50% of all women will also be plagued by urinary tract infections (UTIs) during their lifetime, with nearly 1 in 3 women having a UTI by the age of 24.[36] Growing concerns about antibiotic resistance have led to increased interest in non-antibiotic therapies for recurrent UTIs.

A 12-month clinical trial with 252 postmenopausal women having recurrent UTIs compared a probiotic combination to trimethoprim-sulfamethoxazole (TMP-SMX) for the reduction of UTI recurrence.[37] Women were randomized to (1) TMP-SMX, 480 mg (1 tablet at night) and 1 placebo capsule twice daily; or (2) 1 capsule containing *L rhamnosus* and *L reuteri* (1 billion CFU/day of each strain) twice daily and 1 placebo tablet at night. After 12 months, the mean number of symptomatic UTIs (clinical recurrences) was 2.9 in the antibiotic group and 3.3 in the probiotic group, compared to a mean number of symptomatic UTIs of 7.0 and 6.8 in the year prior for these groups, respectively. The between-group difference in clinical recurrences after the 12-month intervention was not found to be significant. The median time to a recurrence was 3 months in the probiotic group and 6 months in the antibiotic group. However, the antibiotic group was found to have a more than 2-fold increase in resistance to both TMP-SMX and amoxicillin, while the probiotic group showed no increase in antibiotic resistance. The study investigators conclude "lactobacilli may be an acceptable alternative for prevention of UTIs, especially in women who dislike taking antibiotics."[37]

Pregnancy

Preterm birth can be defined as delivery before 37 completed weeks of gestational age.[38] Preterm birth comprises 11% of all live births worldwide, and its complications are estimated to cause 35% of the world's neonatal deaths, or about 11 million deaths annually.[39]

As noted in the BV section above, BV is one of the most common risk factors for preterm birth. A recent Canadian study compared the vaginal microbiome of pregnant women who had spontaneous preterm births with pregnant women who delivered at term.[40] The findings suggested that women who experienced preterm birth were more likely to show more diverse vaginal bacteria (primarily those associated with dysbiosis) and less lactobacilli compared to those who delivered at term. While a causal relationship needs to be studied further, women who delivered at term were more likely to cluster to groups with vaginal microbiota dominated by *L crispatus* and *L gasseri*.

In addition to pregnancy outcomes, the use of probiotics preterm has been associated with a decreased risk of postpartum depression and anxiety,[41] gestational diabetes mellitus,[42] and infant atopic dermatitis (taken preterm and post-term).[43]

Conclusion

Female urogenital infections (such as BV, VVC, and UTIs) and preterm birth affect billions of women each year, resulting in considerable morbidity and healthcare costs. Options for the prevention and treatment of these common conditions are limited, particularly for women with recurrent infections. Clinical data point to the importance of a healthy vaginal microbiome as an approach to potentially reducing the incidence of these infections as well as improving pregnancy outcomes. Oral probiotic products containing combinations of *Lactobacillus* strains have emerged as a safe and effective way for women of all ages to re-establish and maintain healthy vaginal microbiota.

References 8-43 available online at ndnr.com

Donald Brown, ND, is one of the leading authorities in the United States on the safety and efficacy of dietary supplements, evidence-based herbal medicine, and probiotics. Dr Brown currently serves as the director of Natural Product Research Consultants (NPRC) in Seattle, WA. He is a member of the Advisory Board of the American Botanical Council (ABC) and the Editorial Board of *The Integrative Medicine Alert*. Dr Brown is the author of *Herbal Prescriptions for Health and Healing* and was also a contributor to *The Natural Pharmacy*, the *A-Z Guide to Drug-Herb-Vitamin Interactions*, and *The Textbook of Natural Medicine*.

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both the microbiome and hosts from three different cohort studies of microbiome-associated conditions."[2]

Phases 1 and 2

A leading study group within the iHMP is the Vaginal Microbiome Consortium at Virginia Commonwealth University, which has been funded for 2 stages of investigations.[3] In the first stage, the Vaginal Human Microbiome Project, a cross-sectional community study with over 6000 participants, collected vaginal and buccal samples in order to investigate the vaginal microbiome's role in women's urogenital health.[4] This stage of the study involved collecting and analyzing samples from approximately 250 monozygotic and dizygotic twin pairs. In the second stage, samples from more than 2000 pregnant women and their infants were collected over multiple prenatal visits, at delivery, and early postnatal visits, with the goal of clarifying the roles of the vaginal microbiome "in the etiology or prevention of adverse outcomes of pregnancy, with a specific focus on preterm birth and stillbirth."[4] Insights from this work continue to be published.

More than any other organized effort to date, the HMP serves to evolve our understanding of the human microbiome. In the decade since its establishment, the HMP has offered a wealth of data and insights, some of which are discussed here. To explore this content further, visit the "Publications" tab on the HMP and iHMP websites[5,6] or browse an extensive list of tagged articles through a Google Scholar search.[7]

A New Definition of "Normal"

Our understanding of what constitutes "normal" in the microbial makeup of the vagina and surrounding genitourinary tissues has shifted dramatically in recent years. A major contributor to these shifting perspectives is the development of new investigative tools beyond traditional culturing techniques. Modern "omic" studies (eg, genomics, proteomics, metabolomics) offer greater investigative details regarding these microbial communities and their effects on our health and well-being.

For example, in the not too distant past, the idea that the bladder was a sterile environment was a commonly held belief.[8] Today we understand that the bladder and vagina, and areas connecting them, host a diverse ecosystem of more than 200 bacterial species.[9] In a 2011 paper, Ravel et al[10] suggested that vaginal bacterial communities of most healthy women can be clustered into 5 groups, 4 of which are dominated by distinct species of lactobacilli: *Lactobacillus iners, L gasseri, L crispatus,* or *L jensenii.* In the fifth group, however, anaerobic organisms were found to dominate over lactic acid bacteria, challenging the previously held belief that high numbers of lactobacilli and a pH of <4.5 is synonymous with a "healthy" vaginal ecosystem.[10] Of the 396 asymptomatic North American women sampled and self-selected into 1 of 4 ethnic groups (white, black, Asian, and Hispanic), researchers found a higher median pH in Hispanic and black women, reflecting a higher prevalence of bacterial communities not dominated by *Lactobacillus* spp. The findings of this study beg the question of what kinds of bacterial communities are truly "normal" when we consider health of the vagina and surrounding tissues. At least from this study, data suggest that vaginal bacterial communities not dominated by species of *Lactobacillus* are not only common, but in some women are also both "normal" and "healthy."

While the microbial makeup of the vagina is a dominant factor of health, this community does not function in isolation, and likely co-evolved with other elements, such as cytokines and defensins to protect against dysbiosis and infections and to support vaginal health.[9] Of these chemical compounds, antimicrobial peptides (AMP) are specific elements worthy of discussion. These multifunctional, amphipathic molecules minimize pathogenic invasion and replication within host cells, and are able to independently modulate the immune system, helping to reduce inflammation and preserve tissue homeostasis.[11] In a 2015 paper by Yarbrough et al, AMPs were found to be particularly influential to the lower female reproductive tract (FRT), where they act as a first-line defense against pathogen invasion from sexually transmitted and other opportunistic microbes.[11] AMPs were also shown to modulate the vaginal microbiome communities of the lower FRT by preventing the ascension of microbes into the upper FRT.[11] Conversely, this paper also demonstrated that the vaginal microbiome was shown to influence expression of AMP. In this respect, AMP and the vaginal microbiome are interdependent, influencing optimum function of one another, or, in the case of dysbiosis, inducing a unique AMP profile with increased susceptibility to pathogens.[11]

From this research, it becomes clear that previously held beliefs as to what constitutes "normal" and "healthy" vaginal microbiota must evolve. While lactobacilli dominance is still a very common factor of vaginal homeodynamic balance, evidence now suggests it is not a requirement for all women. In addition, we now understand that other critical elements, such as AMPs, work together with and are influenced by the vaginal microbiome to ultimately determine the well-being or the manifestation of disease within these tissues.[11] These elements, their interactions, and the potential influence of disrupting factors, like those discussed in the next section, must all be considered when assessing patient health.

Disrupting Factors

Just as the vaginal microbiome is intimately connected to and influenced by chemical messengers in the surrounding region, it is also susceptible to a range of external factors and health states. For example, in a study by Koumans et al, vaginal swabs were collected and tested for the presence of bacterial vaginosis (BV), a common disturbance of vaginal microflora that is associated with an increased risk of acquiring sexually transmitted infections, HIV, and adverse pregnancy outcomes.[12] Factors found to be significantly correlated to BV included smoking, higher body mass index, sex with a female sex partner, higher numbers of sexual partners over time, and greater frequency of douching.

Additionally, Freitas et al elucidated that pregnancy was a significant influencer of vaginal microbiota composition.[13] In their study of 182 healthy pregnant women, a loss of richness and diversity in vaginal microbiomes due to pregnancy correlated with a shift toward a greater abundance of lactobacilli and a larger total bacterial community. From this investigation, the researchers proposed that the vaginal microbiome potentially plays a significant role in pregnancy outcomes, and emphasized that understanding the roles that these communities play during pregnancy "is a critical step toward being able to exploit the diagnostic potential of the microbiome for the prediction of adverse pregnancy outcomes, as well as to explore alternative therapeutic procedures through microbiological intervention."[13]

A Role for Probiotics

A natural next step in the process of understanding the vaginal microbiome is to consider the emerging body of research on probiotics to support and influence microbiota of the vagina.

As mentioned in the previous section, BV is a common disturbance of vaginal microflora that is associated with a range of negative outcomes and which, in many ways, serves as a common form of dysbiosis from which to extrapolate understanding. Research published in recent years suggests the use of probiotics as a compelling tool to treat this disturbance. In a 2014 pilot trial, *Lactobacillus fermentum* LF15 and *L plantarum* LP01 (each at 400 million CFU per dose) were delivered via slow-release vaginal tablets over an 8-week trial period. By the end of the trial period, only 4 women of the 24 in the active group still met the clinical criteria for BV (measured as a Nugent score of >7). No significant differences were recorded in the placebo group at any time.[14]

Another randomized, clinical trial compared the efficacy of adding short-term versus long-term single-strain probiotic supplementation to a standard treatment protocol for concomitant human papilloma virus (HPV) and BV or vaginitis.[15] Both groups received a standard treatment of either metronidazole (500 mg twice per day for 7 days) or fluconazole (150 mg orally once per day for 2 consecutive days). Women randomized to the short-term probiotic group additionally received vaginally-implanted *Lactobacillus rhamnosus* BMX 54 (10^4 CFU) daily for 3 months, whereas women in the long-term group received the same probiotic daily for 6 months. After a median follow-up of 14 months, women who received the probiotic over 6 months were half as likely to demonstrate HPV-related cytological anomalies and had a total HPV-clearance of 31.2% (as compared to only 11.6% in the short-term group). Results of this study support the long-term use of probiotics to influence and support vaginal microbial health.[15]

Conclusion

Research suggests that the world of the vaginal microbiome is multifaceted and highly influential not only over localized genitourinary health, but also pregnancy and, perhaps, even infant development.[16] With recent innovations in investigative tools, the genomic makeup of vaginal microbiota and the nuances of what constitutes "normal" and "healthy" in this community is rapidly evolving. While the presence of lactobacilli is still accepted as an indicator of vaginal health, we now understand that pH and bacterial community dominance varies among healthy women. Additionally, research has demonstrated that probiotic supplementation is an effective first-line and adjunctive tool to positively influence microbial makeup and the manifestation of health in the vaginal microbiome.

While the presence of lactobacilli is still accepted as an indicator of vaginal health, we now understand that pH and bacterial community dominance varies among healthy women.

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Female-Dominant Autoimmunity

The Role of Progesterone

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We are just beginning to understand the complex nature of the immune system and the cross-talk between the immune system and other systems in the body. The influence of sex hormones is not limited to reproductive tissues; they also exert effects on peripheral systems such as the immune system. In the context of autoimmune disease, there is a known female predominance of many autoimmune diseases. Some examples of female-to-male ratios of specific autoimmune diseases include 16:1 for primary biliary cirrhosis; 12:1 for antiphospholipid syndrome; 9-10:1 for systemic lupus erythematosus (SLE); and 2:1 for multiple sclerosis.[1,2] Other autoimmune conditions with female predominance include Hashimoto's thyroiditis, Graves' disease, scleroderma, and Sjögren's syndrome.[2]

The female predominance of autoimmune disease is highlighted by the fact that the onset of most female-dominant autoimmune diseases occurs following puberty. The ratio of female-to-male risk of SLE and thyroiditis before puberty is lower (3-4:1) than after puberty (9:1), and other autoimmune diseases, such as Sjögren's syndrome and primary biliary cirrhosis, are extremely rare in pediatric populations.[2] Autoimmune diseases whose onset typically occurs before puberty, eg, type 1 diabetes mellitus, appear to exhibit no female polarization.[2] The role of female hormones in autoimmune disease is also observed in symptom severity fluctuations throughout the different phases of the menstrual cycle.[3]

Both genetic and environmental factors contribute to the risk of autoimmune disease: when genetic risk is high, environmental factors become less influential on the onset and severity of disease progression. Although hormone status may play a role in the risk of developing disease, research has thus far found that modulating hormones appears to impact disease activity far more than disease risk.[2] While sexual dimorphism of autoimmune disease includes many hormonal factors, female prevalence of certain autoimmune diseases suggest that sex hormones such as estrogen and progesterone are key players in the development and activity of the female-prevalent autoimmune diseases.

Pregnancy is an excellent example for viewing how sex hormones may influence the immune system. There is a dramatic change in hormones during pregnancy, with progesterone and estrogen levels increasing 5-10-fold within the maternal circulation, and then dropping suddenly drop postpartum, alongside significant immunological shifts both during and after pregnancy.[2] During pregnancy, the immune system must achieve a unique state of equilibrium: being strong and active at the maternal-fetal interface, while also maintaining a state of immunosuppression within the maternal circulation so as to not react to the partially allogenic cells of the fetus. During pregnancy, the uterine lining (the decidua) is an immunologically intense area, tightly regulated in order to ensure the survival of the fetus. Specialized uterine natural killer cells and monocytes are inactivated when encountering the unique HLA-G expression of fetal trophoblastic cells, but are active at disabling any foreign pathogen threatening the fetus.[4] Other known mechanisms of this pregnancy paradox include T-helper-2 (Th2) dominance, upregulation of anti-inflammatory cytokines and immunosuppressive proteins, downregulation of the classical complement pathway, and the blockage of fetal antigen exposure to the maternal immune system.[2,5]

The local protective effects of the maternal-fetal interface appear to be influenced by estrogen and progesterone. While estrogen as well as other steroids play a large role in the totality of the immunological paradox of pregnancy and the development and progression of autoimmune disease, this article will focus on the effects of progesterone on the immune system during pregnancy and in female-prevalent autoimmune disease.

Progesterone's Broad Actions

Progesterone & the Immune System

Progesterone is a steroid hormone produced by the corpus luteum, uterus, adrenal glands, and the brain. Progesterone (P4) binds to many different receptors in both reproductive and non-reproductive tissues; these receptors include membrane-bound progesterone receptors, intracellular progesterone receptors, and glucocorticoid receptors, which are expressed on human immune cells including mast cells, natural killer (NK) cells, macrophages, dendritic cells, and both CD4+ and CD8+ type cells.[2,3] P4 is generally considered an anti-

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inflammatory hormone. Some of its known anti-inflammatory mechanisms include the suppression of proinflammatory Th1 and Th17 differentiation, T-regulatory (T-reg) cell induction and expansion (immune modulating), as well as polarization towards Th2 differentiation and activity.[6]

Progesterone in Pregnancy

Progesterone is secreted by the corpus luteum in the early stages of pregnancy, and later by the placenta after week 8 of gestation. P4 levels rise 10-fold within the maternal circulation and 100-fold within the placenta.[3] This high concentration of P4 is strong enough to signal through the glucocorticoid receptor, which is thought to be one of the mechanisms for the immunosuppressive effect seen during pregnancy.[7] The surge of P4 is credited for Th2 shift, for the expansion and production of the Th2-promoting cytokine, interleukin (IL)-4, the increased expression of uterine NK cells, the suppression of inflammatory cytokine, Th17, and the induction of the T-reg cells during pregnancy.[2,3] A recent study by Shah et al observed that administration of progesterone to healthy, pregnant women suppressed the production of interferon-gamma (IFN-γ), a promoter of Th1-mediated immunity. The study also found that mifepristone, a progesterone receptor antagonist, induced IFN-γ expression.[8]

Progesterone & Autoimmune Disease

The transient modification of the immune system during pregnancy and the clear influence of pregnancy on the presentation of different autoimmune conditions serves as a gateway for our understanding of the role P4 plays in autoimmune disease. While research specifically studying the effects of natural P4 is still lacking, a strong backbone of evidence suggests that therapeutic use of P4 in certain autoimmune diseases may be beneficial in modulating the activity of the disease.

Rheumatoid Arthritis

The hormonal influence in rheumatoid arthritis (RA) is illustrated by the symptomatic changes that occur with the fluctuations of the menstrual cycle, the remission of symptoms during pregnancy, and the increase in flares in the postpartum period.[9,10] RA onset typically occurs after menopause (45-75 years) and nulliparity appears to increase the risk of developing RA, suggesting that estrogen and progesterone may play a protective role in the risk and disease activity of RA.[11] The rapid withdrawal of P4 postpartum may contribute to the increase in risk of RA in susceptible women after delivery.[12] In RA, there is a marked increase in the inflammatory Th17; as discussed, progesterone has been found to induce T-reg cells, suppress Th17 and Th1 differentiation, and promote Th2 dominance, suggesting its protective role in RA. An earlier study by Valentino et al found that women with RA exhibited significantly lower P4 levels during the luteal phase of the menstrual cycle as compared to healthy controls.[13]

However, there is very little in the way of evidence supporting the use of progesterone alone for managing the risk and activity of RA. In fact, many studies (both in vivo and human) fail to show consistent results regarding the influence of P4 in RA, with many showing no amelioration of symptoms of RA by hormone replacement therapy (HRT).[11,14,15]

Multiple Sclerosis

Multiple sclerosis (MS) is an autoimmune condition targeting the central nervous system, driven by myelin-specific CD4+ Th1 cells and inflammatory cytokines. Considering the Th2-promoting effect of progesterone, and its known neuroprotective, anti-inflammatory and pro-myelinating properties, this hormone has been a therapy of interest for modulating disease activity in MS.[16] Similar to RA, the hormonal impact of progesterone on disease activity in MS is represented by the amelioration of symptoms during pregnancy and the increase in disease flares within the postpartum period.[2] The immunomodulatory effect of P4 can be observed in animal models of experimental autoimmune encephalitis (EAE) – the in-vivo representation of MS. These animal models have shown that, at the onset of EAE, progesterone can suppress inflammation by reducing proinflammatory IL-2, IL-17, and IL-23, and increasing B-cells and anti-inflammatory IL-10, thereby reducing the severity of disease progression.[17] In another in-vivo model of demyelination, Ye et al found that treatment of progesterone at the onset of disease ameliorated demyelination and the resulting neurobehavioral deficits.[18]

An ongoing human clinical trial plans to determine the effects of high-dose progestin administration on postpartum MS flares at the onset of the postpartum period.[19]

Systemic Lupus Erythematosus

The typical onset of SLE, occurring between menarche and menopause, as well as the high female:male dominance (9:1) of this disease, suggest that hormones play a role in the development and activity of SLE.[11] Early menarche is considered an independent risk factor for SLE, and initial SLE flares in women have been linked to low P4, indicating a pathogenic role of estrogen and a protective role of P4 in both the risk and activity of SLE.[11] Symptoms of SLE have been found to be exacerbated by pregnancy, with SLE flare rates higher in pregnant patients compared to non-pregnant patients.[20] SLE flares have been associated with Th2 dominance and increased humoral activity, a state that is favorable for other autoimmune conditions, such as RA and MS.[3] However, there is also evidence that pregnancy itself does not influence the risk of SLE flares and

that the biggest risk factor for SLE flares during pregnancy is the severity of disease activity 6 months prior to conception, as well as the discontinuation of medication at the onset of pregnancy.[21] Therefore, high circulating levels of hormones may not actually influence disease activity in SLE, as compared with autoimmune conditions like RA and MS.

A link has been observed between the risk of SLE flares in those with active disease and estrogen-containing HRT and oral contraceptive (OCP) use, as well as a dose-dependent relationship between the level of estrogen in HRT/OCPs.[22,23] SLE patients often experience P4 deficiency during the luteal phase of the menstrual cycle, suggesting that P4 may have a protective role against SLE; however, it is unknown if this is a consequence of the disease or a risk factor.[2] Progestin-only forms of OCPs and HRT do not appear to increase risk and can even reduce flares of SLE.[24] High circulating levels of type 1 IFN-α and IFN-ß are a hallmark of SLE.[3] A recent study found that progestogens (natural progesterone and synthetic medroxyprogesterone acetate) appear to suppress plasmacytoid dendritic cell production of IFN-α, as well as the activation of the IFN-inducing transcription factor IRF-5.[25] This indicates that modifying P4 levels may be an effective target for modulating disease risk and activity of SLE.

While there is some evidence to suggest that there is no conferred difference in the risk of SLE flares between combined and progestin-only OCPs and copper IUDs, other studies suggest that estrogen is an aggravating factor in terms of a link between SLE flares and HRT.[2] However, especially considering the high risk for thrombosis in SLE patients (specifically those with high anti-phospholipid antibodies), progesterone-only OCPs should be considered for SLE patients seeking oral forms of contraception.[2]

Considering the currently available research, bioidentical progesterone may be a viable option in modifying disease activity in female-dominant autoimmune diseases.

Clinical Considerations

While many experimental animal models indicate that progesterone may have a large impact on immunological function and disease activity of autoimmune conditions, human clinical trials are greatly lacking. Existing observational studies on the impact of HRT and OCPs on autoimmune disease typically used synthetic progestins to represent P4 activity rather than bioidentical P4, which would typically be the treatment of choice by naturopathic doctors. Considering the influence of physiological P4 on immune function observed in pregnancy when P4 levels are peaked, it may be safe to assume that bioidentical P4 represents a viable treatment option to mimic these effects.

Another consideration are the inconsistent results from using HRT in autoimmune disease. Many of these studies fail to provide treatments that mimic the physiological levels of pregnancy; the activity of progesterone on progesterone- and glucocorticoid receptors (GRs) is dose-dependent, with the latter requiring extremely high levels of P4 (pregnancy levels) for activation.[2] GR activation has been proposed as the main mechanism of immune modulation by P4, given that these receptors are highly expressed on immune cells and that steroids that bind to the GRs (ie, corticosteroids) are the standard treatment for inflammatory flares in autoimmune disease.[26] Perhaps dosing bioidentical progesterone at levels mimicking pregnancy can produce more consistently positive results.

Considering the currently available research, bioidentical progesterone may be a viable option in modifying disease activity in female-dominant autoimmune diseases. Clinicians should base this treatment on the patient's individual requirements – the category of autoimmune disease (ie, whether it is a female-dominant type) and outcomes of progesterone testing. A detailed history of menstrual cycle activity and fertility should be used to help determine whether progesterone might be a treatment of value for an autoimmune patient.

Autoimmune diseases still remain as complex, multifactorial conditions that are influenced by genetic, stochastic, and environmental triggers. It would be silly to consider hormones to be a sole contributing factor when managing female-dominant autoimmune disease. However, insights into how hormones impact risk and disease activity in autoimmune disease provide clinicians a valuable tool to consider when treating autoimmune patients.

References available online at ndnr.com

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Homeopathy: An Ally of Anxiety

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According to the Centers for Disease Control and Prevention (CDC), anxiety disorders – including panic disorder and posttraumatic stress disorder (PTSD) – are the most common class of mental health disorders in the general population.[1] Anxiety disorders affect over 40 million adults in the United States today, with panic disorders affecting 6 million.[2,3] The overall US financial burden of the anxiety-disorder illnesses is over $42 billion per year, which is one-third of the country's total mental health bill.[2] Unfortunately, of those 40 million people, only 36% are getting any form of treatment.[4] The SSRI antidepressants, paroxetine and sertraline, are ranked 7th and 8th among the top 10 most prescribed pharmaceuticals in the United States today. Unfortunately, these drugs can come with unwanted effects as well, such as decreased sexual desire and impotence, confusion, aggression, and insomnia.[5,6]

Thankfully, this is not the only option available. Homeopathy is not only low in cost and causes very few to no side effects, its effectiveness is also undeniable when prescribed by a competent practitioner. Homeopathic treatment of anxiety and panic disorders has been shown to be effective, both clinically and in research.[7] This medicine comes alive in a case-study setting. As such, we present here the resolution of one woman's panic attacks via daily treatment with Arsenicum album 30C.

Patient Presentation

Linda (fictitious name to preserve patient confidentiality) is a 32-year-old female patient who presented to the Bastyr University Clinic with a 2.5-month history of panic attacks occurring 1-2 times per week. The initial episode began in the middle of the night, when she woke in a panic. She felt dizzy, frightened, and noted tingling in her arms. She also experienced palpitations, burning chest pressure, and the sensation of something stuck in her throat. Convinced she was having a heart attack, she called 911. After transport to the hospital, an EKG was performed and pronounced within normal limits (WNL).

Linda was diagnosed with anxiety due to stress, and was prescribed alprazolam, to take as needed. She was hesitant to take it. Several nights later, she experienced a similar episode. Linda returned to the emergency room because she felt she was choking due to the "stuck" sensation in her throat. At this visit, a chest X-ray was performed, with normal results. She was instructed to take her anti-anxiety medication and see her primary-care physician (PCP) for suspected gastroesophageal reflux disease (GERD).

Her PCP prescribed daily pantoprazole, which only minimally decreased the sensations of chest burning. A third attack occurred several days later after eating dinner, when she felt the sensation of food stuck in her throat. Linda visited her nearest urgent care and again was diagnosed with anxiety and heartburn. An endoscopy was ordered by her PCP, which revealed a hiatal hernia and gastritis, with *Helicobacter pylori*. For this she was prescribed clarithromycin (500 mg, 1 cap twice daily) and amoxicillin (500 mg, 2 caps twice daily) for 14 days. Treatment for her gastritis and *H pylori* did not affect the frequency or character of her panic attacks. Since then, she continued to have 1-2 panic attacks per week, without ER visits, for 2.5 more months before coming in to the Bastyr University Clinic for homeopathic treatment.

Linda had never had a panic attack in her life before this all happened. The weeks before her first panic attack were filled with shock and disappointment due her sister's sudden divorce and the complexity of its effect on her entire family. She explained she is a "big time worrier," and would purposefully plan her day to be around other people, in the event that something were to happen to her.

Current medications included a levonorgestrel IUD, pantoprazole (40 mg daily), alprazolam (0.5 mg as needed for 1 week), then switched to paroxetine (20 mg daily) because the alprazolam wasn't helping. She did not take regular supplements. Her diet was whole-foods-based, with no major restrictions, and appeared non-contributory to her symptoms. She denied consumption of caffeine, alcohol, tobacco, or recreational drugs. She slept restfully, between 8-9 hours per night, had normal daily bowel movements, and exercised 3-5 days per week by lifting weights and swimming. She is a stay-at-home mother for her 2 school-aged children. She rated her stress a 5/10 (10=worst) on most days, stating she had to "hold everything together" and was always busy with to-do lists at home.

Review of systems was positive for tinnitus for 1 week, substernal chest pain after eating, and occasional dizziness when standing. Vitals included blood pressure of 100/60 mm Hg, heart rate of 72, and temperature of 98.1°F; height was 4'11.5" and weight was 102 lb. Physical exam was unremarkable.

Workup & Homeopathic Assessment

All performed cardiovascular assessments revealed regular rate and rhythm, without pathology or complications. To rule out other medical conditions such as hyperthyroidism or anemia, the following labs were ordered: CBC with differential, CMP, serum vitamin D3, TSH/fT3/fT4, and total T4. Results were all WNL. Our working diagnosis was panic disorder, as she met the criteria per the DSM-V:

1. She experienced recurrent, unexpected panic attacks characterized by an intense surge of fear that would reach its peak within minutes and included at least 4 symptoms in a given list of 13:
    a. Trembling
    b. Palpitations
    c. Feelings of choking
    d. Chest pain
    e. Dizziness
    f. Fear of dying
2. She experienced at least 1 attack followed by 1 or more months of persistent concern or worry that additional attacks would occur, along with significant behavior changes related to the attacks:
    a. Avoided being home alone by purposely surrounding herself with people
3. Symptoms were not attributable to another physiological or medical condition
4. Symptoms were not better explained by another mental disorder

Other considerations included the hiatal hernia found on endoscopy. Future plans included a referral to the physical medicine rotation at the clinic, to rule out its role in the chest pressure or globus hystericus sensations that preceded her panic attacks. We moved forward with the homeopathic intake and gathered the following information.

Characteristic Symptoms (based on presence & intensity)

- Ailments from fright, shock
- Anxiety occurring at night in bed
- Tingling in her upper arms and hands

- < thinking of complaints
- Fear of suffocation
- Body shivers, trembles with feeling of great chilliness
- Lump in throat
- Burning chest pressure in sub-sternum
- Feels strong urge to burp, since it ameliorates the fear and anxiety, but cannot
- Extreme fear and worry about many areas of life, including: being alone, death, having a stroke/her health, that something will happen, ghosts, heights, robbers, darkness
- > with consolation and company

Rubrics & Remedies

Given the information above, the rubrics listed in Figure 1 were used in MacRepertory.

The top remedies indicated in the repertorization were Arsenicum album, Phosphorus, and Aconitum napellus. We decided to go with homeopathic Arsenicum album due to her certainty of impending death and the intense fear and anxiety surrounding her health during her panic attacks. Linda had many fears, in general, especially the characteristic Arsenicum fears of death, being alone, and robbers. Her ailments were worse at night, and her panic attacks started with full-body chilliness that then turned into trembling and shaking with clammy hands. She was very restless and would often spring out of bed. She would feel burning chest pains with palpitations and the sensation of a lump in her throat. Thoughts about her health would trigger a panic attack. She felt better with consolation, touch, and knowing that people were on their way to help her, which is typical of Arsenicum patients who need reassurance. Overall, as a person and in her case, Arsenicum seemed to cover her susceptibilities the best.

We were able to rule out the other top-fitting remedies by confirming discrepancies of their profile in the materia medica. Aconitum was our second choice, given the sudden onset of fear, ailments from shock, tingling in the extremities; Aconitum was most likely the remedy she needed in the moment of a panic attack. However, in addition to many of these symptoms, Arsenicum also covers burning chest pains and > from consolation, the latter of which is not covered by Aconite. Phosphorus was interesting but unfit for this case due to her lack of thirst and time of aggravation, although she is much > by company and consolation. The extreme worry about her health and fear of robbers with restlessness characterizes Arsenicum more so than Phosphorus.

Arsenicum album 30C was prescribed, 3 pellets once per day in the morning, with follow-up in 2 weeks. The patient was educated on the possible reactions of homeopathy, including the potential for an initial aggravation state followed by improvement of symptoms, and on the ideas of "exonerative discharge" and "return of old symptoms."

Follow-up & Results

After 1 week, Linda called with some questions. She explained that her anxiety had worsened during the first few days of taking the remedy, and that a few

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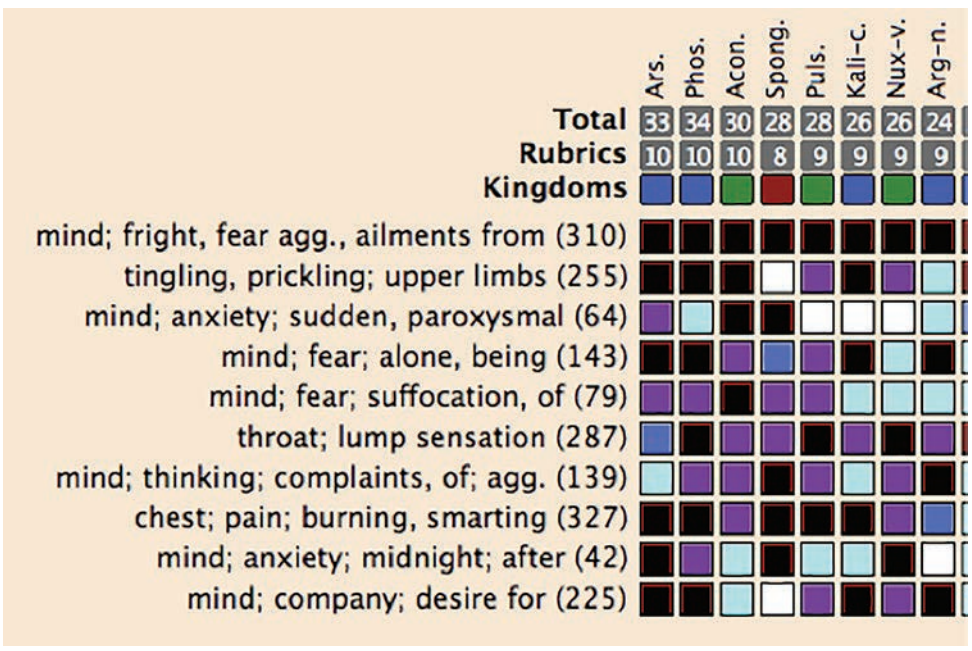
Figure 1. **Repertorization**



Linda was elated with her results, as she never thought she would feel "normal" again.

patches of what appeared to be eczema had appeared on different parts of her body. She did note that the rash had resolved and her anxiety had also started to improve; however, she wanted to confirm that this was a normal progression of homeopathy. We clarified with her that the rash was indeed an example of exonerative discharge and that it indicated a positive reaction to the remedy. This was our first sign that she had responded positively to the remedy and that Arsenicum album was the right match for her anxiety about health with a desire for reassurance!

Two Weeks Later

At her first follow-up, Linda reported that she had not had any panic attacks since we saw her last and that she felt 80% better overall. She explained that when she felt anxiety she would wait, expecting the chills and trembling to begin, but that it would never progress to a panic attack. She reported that her anxiety about her health, fear of death, fear of being alone, and the sensation of a lump in her throat were all 80% better. The chest pressure was better but still present, and she had begun to decrease her dosage of pantoprazole under the guidance of her PCP. We interpreted the change in chest pressure and anxiety as a positive sign, and we recommended continuing on with her normal prescription and to follow up by phone in another 2 weeks.

Two Weeks Later

At her second follow-up, Linda reported that she still had no panic attacks and that her fears, anxiety about health, and shivering/trembling sensations were all entirely resolved! The burning chest sensations were slightly persisting but almost gone. She had titrated her pantoprazole down to its lowest dose at the day of our visit and planned to discontinue it. Linda was elated with her results, as she never thought she would feel "normal" again. We decided to have 1 final follow-up in a month, with the plan to discharge her if her symptoms had remained stable.

One Month Later

At this last follow-up, 4 weeks later (6 weeks total treatment), she reported that all symptoms of panic attacks, anxiety, fear, and chest sensations completely resolved. She had stopped the remedy 1 week prior to visiting us because she was elated with the results and felt she no longer needed it. With this goal accomplished, this appointment was the completion of care, and we happily discharged her from the shift.

Conclusion

This is one homeopathic success story among the many that exist. The end result of this story is that our patient not only was free from experiencing frightening panic attacks, but she also began to fully enjoy her life without fear of something bad happening to her. She avoided further ER visits and the use of anti-anxiety medication. She was also able to discontinue the use of daily proton-pump inhibitors and to manage her GERD-type symptoms with diet and physical medicine.

The use of homeopathy for anxiety and panic is significant, affordable, safe, and without strong side effects. Careful prescription by a competent naturopathic doctor or homeopathic practitioner is key to ensuring proper remedy selection and management of the case. The improvement to a patient's life is lasting and permeates many levels of their experience of living and health overall. Continued study of homeopathy and its role in mental health treatment is imperative to our oath as naturopathic doctors to first do no harm, and to implement the power of nature in initiating optimized health for patients everywhere.

Morgan MacDermott is a 5th-year student clinician at Bastyr University in San Diego, CA. Morgan is passionate about the use of homeopathy, botanicals, functional medicine, and nature cure to reach each individual's state of vibrant health. With many experiences of success on the Bastyr homeopathy shift, she has sought out additional training and understanding of this valuable and effective modality. She is wildly enthusiastic about using naturopathic medicine to treat autoimmune diseases as well as to optimize the health of mothers and families through the transitions of preconception, prenatal, and postpartum.

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Alcoholic Cirrhosis with Ascites

A Case Report & Treatment Options

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One of the major healthcare problems worldwide is excessive alcohol consumption. The liver is the target organ, since it is the primary site of ethanol metabolism. Excessive and chronic alcohol consumption leads to wide-spectrum, progressive hepatic lesions, ranging from steatosis to cirrhosis. Steatosis is the first physiological response to heavy alcohol drinking, and is characterized by fat deposition in hepatocytes. The next stage is typically progression to hepatitis, which is a more severe, inflammatory type of liver injury. The inflammation in hepatitis can cause fibrosis, and eventually cirrhosis if allowed to continue, which is characterized by excessive liver scarring, vascular alterations, and eventual liver failure.

The development of complications, such as ascites, variceal bleeding, hepatic encephalopathy, spontaneous bacterial peritonitis, or hepatorenal syndrome, has a significant impact on the prognosis of patients with alcoholic cirrhosis. The 5-year survival of individuals who develop any of these complications is only 20-50% of that for patients with compensated cirrhosis.[1] Thirty-five percent of heavy drinkers develop end-stage alcoholic liver disease. Within 10 years of the diagnosis of cirrhosis, more than 50% of patients develop ascites. Mortality is 15% at 1-year follow-up and 44% at 5-year follow-up.[1] The median survival of patients with ascites refractory to medical treatment is approximately 6 months. There are no FDA-approved pharmacological, supplemental, or nutritional therapies for patients with alcoholic cirrhosis. Hence, this article reviews a case report and the research we conducted on management options for such patients.

Management Options

Much research has been done on both pharmaceutical and nutritional agents that might be of use in patients with alcoholic cirrhosis. Nutritional research has focused primarily on the correction of nutritional deficiencies, such as the fat-soluble vitamins (A, D, E and K); folate, thiamine, niacin, and pyridoxine; and the trace elements zinc, magnesium, and selenium[2]; as well as on the treatment of abstinence syndrome. Micronutrient supplementation should be considered when deficiencies are detected. Multiple studies demonstrate the importance of zinc in liver disease.[3-6] It has been shown that zinc blocks most mechanisms of liver injury, including increased gut permeability, oxidative stress, increased tumor necrosis factor (TNF) production, and hepatocyte apoptosis. Supplementation with 50 mg of elemental zinc could therefore be an effective means of improving liver function in patients with alcoholic liver disease.[7]

Pharmaceutical treatment options for more severe alcoholic hepatitis include corticosteroids and pentoxifylline, an anti-TNF therapy.[8] The rationale for using steroids is their ability to suppress the immune response and proinflammatory cytokine response. Current guidelines suggest discontinuation of therapy if bilirubin levels have not decreased by Day 7 of treatment.[9]

Naturopathic treatments for alcoholic liver disease include a mixed-strain probiotic, which has been shown in studies to positively influence the gut microbiota, immunological status, and liver function in patients with liver disease.[10,11] N-acetylcysteine (NAC), in combination with prednisolone, was shown in a randomized trial to reduce 1-month mortality (8% vs 24%) as well as the incidence of hepatorenal syndrome (9% vs 22%) and infection, compared to prednisolone alone.[12] The favorable safety profile of NAC makes it a viable option, in combination with corticosteroids, for patients with severe disease.[12] Silymarin (in milk thistle) has been shown in rats to protect against lipid peroxidation due to its antioxidant properties; it also has anti-inflammatory and anti-fibrotic effects.[13] Although silymarin research has been conducted on animal models, it has been used to support liver function for decades. Finally, S-adenosylmethionine (SAMe) is a useful agent for these patients. SAMe is an obligatory intermediate in the conversion of methionine to cysteine in the hepatic transsulfuration pathway; it is also involved in the synthesis of polyamines, choline, and glutathione (GSH), and is the major methylating agent for a vast number of molecules via specific methyltransferases.[14-17] In one randomized, multicenter trial, supplementation with SAMe was shown to delay liver transplantation and improve survival in patients with alcoholic liver cirrhosis.[14]

Case Description

KM, a 70-year-old female with decompensated alcoholic liver cirrhosis and refractory ascites, initially presented to Bastyr University Clinic in June 2017. Her height was 5 ft 7 in, and she weighed 201 lb (91 kg). However, her weight would be more accurately determined immediately following paracentesis.

KM is a retired loan officer who lives alone. She was an alcoholic for 40 years and quit just a few years ago. Cirrhosis was diagnosed in 2011, and fluid began building in her abdomen approximately 4 years ago. Family history was non-significant.

At the first visit, KM's review of systems was positive for abdominal pain and constipation, leg swelling, skin rash, and insomnia. At the subsequent visit, 1 month later, she was positive for shortness of breath (SOB), bilateral lower-leg edema, dry cough every night and difficulty breathing when lying down, nasal drip for years, and difficulty walking due to her weight and SOB. By that visit, KM had experienced 7 paracenteses, with approximate fluid removal of 3.5-4 liters weekly. Her SOB and cough were most likely due to the volume of ascitic fluid.

Physical Exam

Physical examination revealed a blood pressure of 110/64 mm/Hg, temperature of 97.7°F, and pulse of 68. Bilateral edema was present on both legs (+3) and there was a notable absence of peripheral pulses – dorsalis pedis and posterior tibial. Auscultation revealed clear respiration in posterior fields, with no wheezing, rhonchi, or accessory muscle use upon respiration. Chest X-ray was unremarkable. KM's abdomen showed severe ascites, a midline scar, and new stretch marks. Bowel sounds were present in all 4 quadrants. Her abdomen was dull to percussion. Hepatomegaly was present, and the right-upper quadrant was tender to palpation. Scratching on both forearms had produced an erythematous rash on her skin, consisting of multiple macules, 5-6 mm in diameter, variably shaped, and with random distribution on wrists and forearms.

The patient reported poor dietary habits. She usually had 2 meals per day, with large gaps in between. Her diet was characterized by poor nutritional variation and occasional wine consumption. This diet presentation is very common among patients with alcoholic liver disease, which is why nutritional corrections are an first essential step in patient management. KM's labs was significant for liver failure, prediabetes, and iron deficiency. Diagnoses included alcoholic cirrhosis of the liver with ascites, prediabetes, and iron deficiency anemia.

> Even though the median survival of patients with ascites refractory to medical treatment is approximately 6 months, supportive care can prolong a patient's function and prevent rapid regression.

Treatment Plan

KM's medication list included furosemide 20 mg/day, along with the spironolactone 50 mg/day, to control her ascites. She was also taking oral lactulose 30 ml 3 times/day as needed to achieve 2-3 soft bowel movements.

Dietary corrections included: avoidance of huge gaps between meals; incorporation of low-glycemic index foods into the diet; sufficient protein intake (1.2-1.5 g/kg/day) but not overload (for controlling blood sugar and preventing hepatorenal syndrome).

Supplement recommendations included:

- Iron, for anemia
- A nutritional and botanical formula for hepatic and gastrointestinal detoxification (2 caps/day);
- Silybin with phosphatidylcholine (1 cap twice daily)
- A probiotic formula containing 8 different strains (1 cap 4 times daily)
- SAMe (1 cap twice daily), for liver function
- Melatonin (3 mg), for sleep

One Month Later

On the second follow-up visit, 1 month later, the patient reported that she had delayed her most recently scheduled paracentesis, and felt better overall. However, it is difficult to objectively assess the progression and effects of supportive treatments for patients in terminal stages of illness. Even though recent literature suggests that the median survival of patients with ascites refractory to medical treatment is approximately 6 months,[18] we believe that supportive care can prolong a patient's function and prevent rapid regression.

Summary

Although much knowledge has been gained in the understanding of the pathology, pathophysiology, epidemiology, and diagnoses of alcoholic liver disease, management options for a satisfactory outcome are still disappointing, and despite a large number of recent treatment trials, the ideal pharmacotherapy approach to alcoholic liver disease remains undefined. The development of complications in patients with alcoholic cirrhosis significantly impacts their prognosis. Once treatment-refractory ascites has developed, median survival drops precipitously. There are no FDA-approved pharmacological, supplemental, or nutritional therapies for patients with alcoholic cirrhosis. Because a naturopathic approach targets physiological function and treats the whole person, it is likely the only effective management option available for the patients with end-stage of alcoholic liver cirrhosis.

Most essential is supportive care and focus on abstinence and nutrition. Malnutrition is prevalent in liver disease, and the degree of malnutrition correlates with the development of serious complications such as encephalopathy, ascites, and hepatorenal syndrome. Research has shown that patients with chronic liver conditions are often deficient in several fat-soluble vitamins, B vitamins, and trace elements. Correction of these deficiencies is essential for restoring function.

Numerous natural agents, such as silymarin, NAC, SAMe, and probiotics have demonstrated efficacy in patients with alcoholic liver cirrhosis, and are all associated with favorable safety profiles. Perhaps the most promising areas for the future research and future clinical trials include gut microbes that target hepatic inflammation and infections through immune modulation, thereby promoting liver regeneration. Clinical trials on the use of all of these agents in human models are needed.

Most importantly, alcoholic liver disease is a preventable disease in the early stages, thus more efforts should be focused on prevention.

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Lidia Martyanova came to the United States from Russia in 2011 in order to learn English and earn a degree in naturopathic medicine. She graduated from Bastyr University in the summer of 2018. Lidia completed her first medical degree in Russia, along with an internship in general practice and residency in gastroenterology. However, while working as a doctor in Russia, she felt that conventional medicine was missing many essential pieces, and she was drawn to naturopathic medicine philosophy and approach. Lydia has strong interests in gastroenterology, women's health, children's health, functional medicine, nutrition, naturopathic medicine, and naturopathic aesthetics.

Baljit Khamba, ND, MPH, is a licensed naturopathic doctor in California. Dr Khamba completed her (honors) Bachelor of Science degree (specializing in psychology), as well as her Masters in Public Health degree, at York University, in Toronto, Canada. She received her naturopathic doctoral degree from the Canadian College of Naturopathic Medicine (CCNM), also in Toronto. She was also involved with research projects at the University of Alberta on natural health product safety. Dr Khamba is a member of the American Osteopathic Association of Prolotherapy Regenerative Medicine. Email: bkhamba@bastyr.edu

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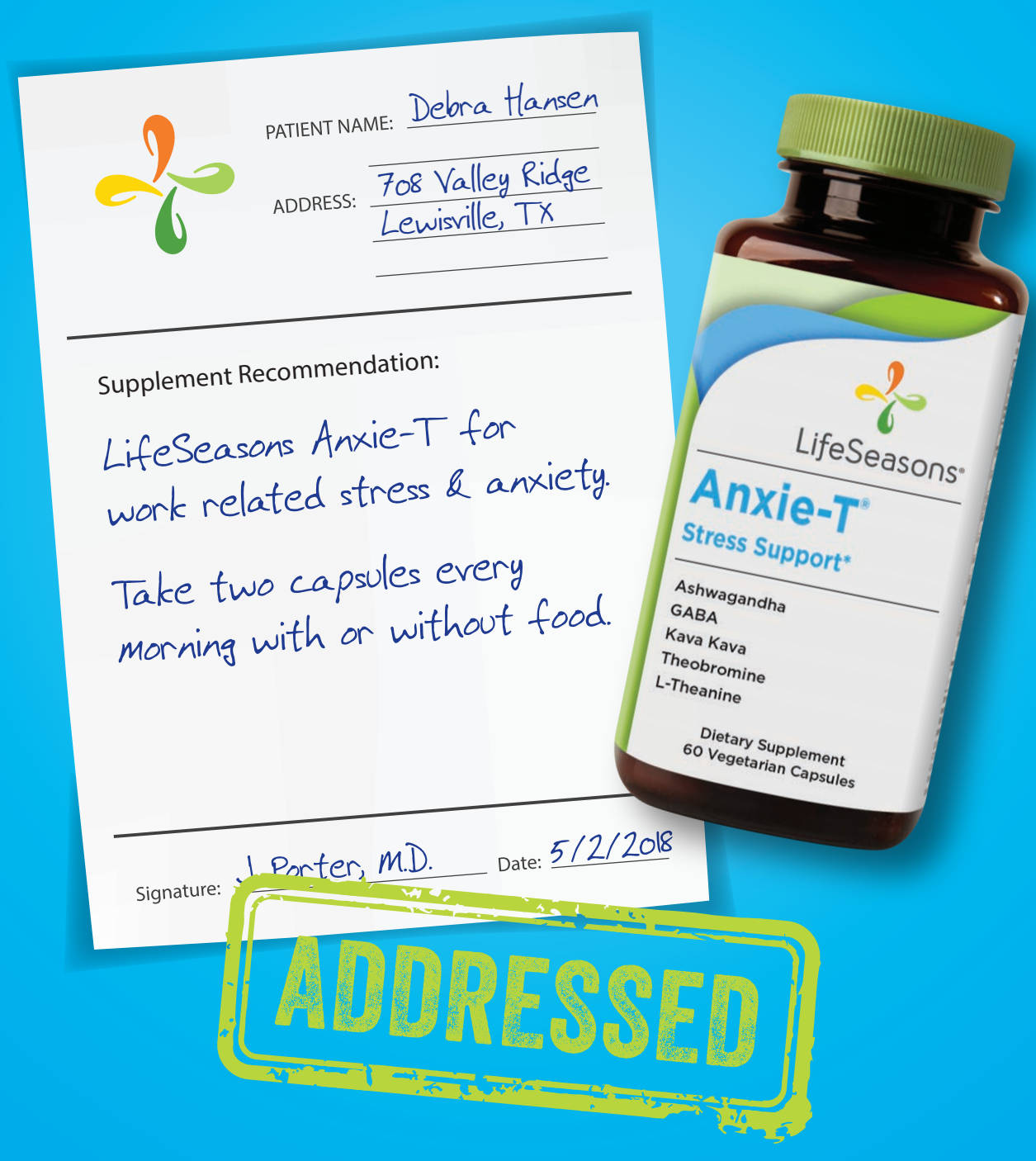
Common patient concerns.



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Miscarriage Prevention

Case Studies of Pranic Healing

RHONDA STEINKE, ND
RACHEL HICKEY

Spontaneous abortion, or miscarriage, is clinically recognized as pregnancy loss before 20 weeks of gestation.[1] Roughly 15% of recognized pregnancies end up in miscarriage,[2] which leaves a relatively large number of women having to grieve the loss of a child. Additionally, many cases of miscarriages are unreported, so the incidence may be even higher.[3]

Fifty percent of first-trimester pregnancy losses are caused by fetal chromosome abnormalities and are thus thought to be unavoidable.[1] Possible preventable risk factors and etiologies accounting for the other 50% of miscarriages include advancing maternal age, maternal diseases such as diabetes, thyroid disease, and thrombophilia, extremes of maternal weight, uterine structural abnormalities, and exposure to teratogens or infection.[4] Furthermore, psychological stress before and during a pregnancy can increase the risk of miscarriage by approximately 42%.[3] Research shows that women who have experienced pregnancy loss tend to have heightened psychological stress, leading to an increased risk of depression, anxiety, and posttraumatic stress disorder (PTSD),[5] along with sadness and excessive worry during subsequent pregnancies.[6] It is clear from these findings that the psychological well-being of the patient should be taken into account when trying to prevent a miscarriage from occurring.

Dr Steinke uses progesterone therapy for recurrent miscarriage and threatened spontaneous abortion. She starts by measuring serum progesterone at baseline and again 48 hours later, then prescribes bioidentical progesterone accordingly. Progesterone treatment has been shown to lower rates of miscarriage.[7] However, progesterone treatment remains controversial, with research suggesting no benefit of progesterone therapy in preventing miscarriage.[8,9] It also does not incorporate the psychological well-being of the patient.

Pranic Healing for Miscarriage

We propose a safe treatment for miscarriage prevention: Pranic Healing. This is a no-touch healing modality that uses life force (prana) to remove stagnant, used-up prana in the body and to energize the body and accelerate its healing process. Pranic Healing's law of self-recovery parallels the naturopathic principle of *Vis medicatrix naturae*. The law of self-recovery states that the body, in general, has the innate capacity to heal itself. By using prana, this modality corrects imbalances within the energetic anatomy, thereby assisting in a more rapid healing process.

While supporting women with progesterone therapy for miscarriage prevention, Dr Steinke has found that waiting causes the most psychological stress – specifically, waiting to see if progesterone therapy is warranted, and again to see if it works. During these periods, she has offered Pranic Healing to support women emotionally and physically and has found it to be quite successful. We would like to highlight 3 different cases for which Pranic Healing has been supportive.

Case Study 1

The first patient is a 27-year-old female who initially presented with concerns of a prolactin-secreting pituitary adenoma, heart palpitations, severe headaches, and a health goal of achieving a healthy and natural second pregnancy. Because of the prolactinoma, she was told it would be challenging to conceive; however, she was able to conceive her first child with assistance of fertility treatments. After a year of diet and lifestyle modifications, optimal nutrition, and constitutional homeopathy, this patient was able to conceive her second child naturally. Six weeks into her second pregnancy she experienced symptoms of vaginal bleeding. Her midwife told her to prepare herself for miscarriage. The patient called Dr Steinke and asked whether there were any treatments she could try, to help prevent miscarriage. Dr Steinke told the patient about Pranic Healing.

After 1 session of Pranic Healing, the bleeding ceased completely. The patient's midwife prescribed progesterone therapy the following week, and the pregnancy was carried to full term. The patient attributes the miscarriage prevention of her second child to Pranic Healing.

Soon after having her second child was born, this patient desired a third child; however, due to difficulty experienced with the previous pregnancy, she was not optimistic. Challenges appeared within the first trimester when the patient presented again with vaginal bleeding. The Pranic Healing protocol for miscarriage prevention was applied, and within 1 session the vaginal bleeding stopped.

Progesterone was later prescribed, and serum levels of the hormone increased, but vaginal bleeding resumed. Her midwife ordered an ultrasound, which revealed a tear in her uterus lining.

Three Pranic Healing sessions were conducted to control the bleeding. Pranic Healing was again applied at 41 weeks, due to concerns about the baby being late-term and the mother not being able to deliver in a birthing center. The Pranic Healing protocol for facilitating labor was applied 2 times within 2 days. The baby was delivered within 1 hour of starting contractions on the second day of treatment. The patient stated that Pranic Healing supported her emotionally and helped her feel certain about a positive outcome.

Case Study 2

The second patient is a 32-year-old female whose first pregnancy ended in a miscarriage. During her second pregnancy she was supported with progesterone therapy into her third trimester, at which point she self-reduced the prescription dose frequency. A routine blood test showed that progesterone levels had dropped, and the patient admitted that she hadn't felt much fetal movement. As she resumed a proper progesterone dosage, Pranic Healing was suggested until levels were stable.

Three sessions of Pranic Healing were completed, after which the patient reported feeling more fetal movement. She also stated that she felt healthier and stronger after Pranic Healing and that it provided her with a sense of hope and relief. Her baby was delivered full-term.

Case Study 3

The third patient is a 32-year-old female who had been diagnosed with autoimmune thyroiditis and had experienced 3 previous miscarriages. Along with progesterone therapy, Pranic Healing was applied 1-2 times per week throughout the first trimester for miscarriage prevention, as well as to help manage her emotions. After already living with 3 miscarriages, the patient housed a lot of fear and anxiety around the prospect of having another miscarriage.

She reported that the Pranic Healing sessions significantly diminished these symptoms and she was able to remain positive throughout the pregnancy. She also believes that Pranic Healing contributed to her having a natural labor and delivery.

Conclusion

With these individualized cases, it is impossible to know whether there would have been a different outcome if Pranic Healing was not applied. Although more research is needed supporting the use of Pranic Healing as a miscarriage prevention therapy, these case studies do suggest benefits from this safe and simple healing modality. The emotional relief experienced by these 3 patients in and of itself is enough to warrant the use of Pranic Healing in these types of situations, especially since increased psychological stress has been associated with an increase risk of miscarriage. Pranic Healing is another tool that physicians can offer in conjunction with progesterone therapy or when progesterone therapy isn't warranted or isn't working.

The Pranic Healing protocol for facilitating labor was applied 2 times within 2 days. The baby was delivered within 1 hour of starting contractions on the second day of treatment.

Rhonda Steinke, ND, is a naturopathic physician who brings a distinct quality to her medical practice in Gilbert, AZ, by utilizing Pranic Healing. It was through the use of this modality with her own health crisis that emphasized for her the power of Pranic Healing. Dr Steinke truly enjoys being a bridge between the conventional and energetic sciences.

Rachel Hickey is a naturopathic medical student and Pranic Healer. Before starting medical school, she obtained her master's degree in Biochemistry and Molecular Biology, and thus also offers a unique perspective on the connection between the conventional and energetic sciences. Like Dr Steinke, Rachel discovered the power of Pranic Healing through her own healing journey, and she hopes to bring awareness to this therapeutic modality through communication and research.

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Cupping Therapy for Cellulite

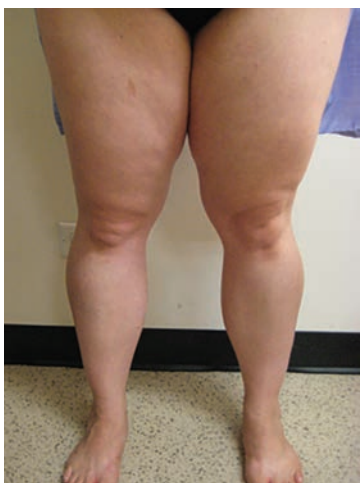
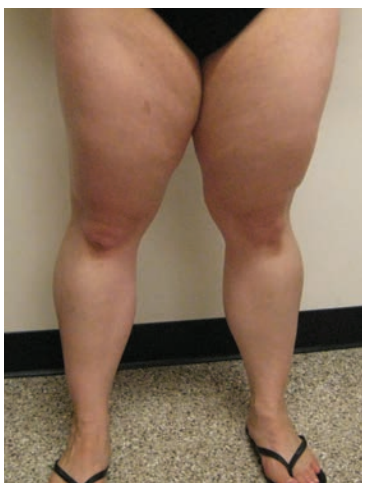
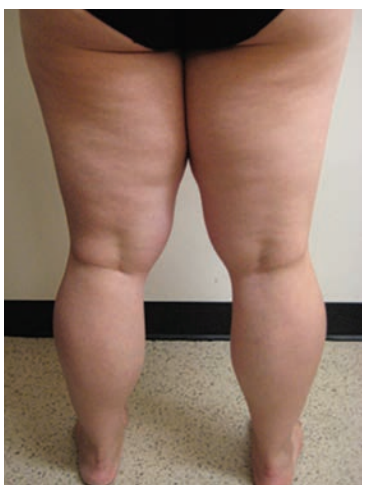
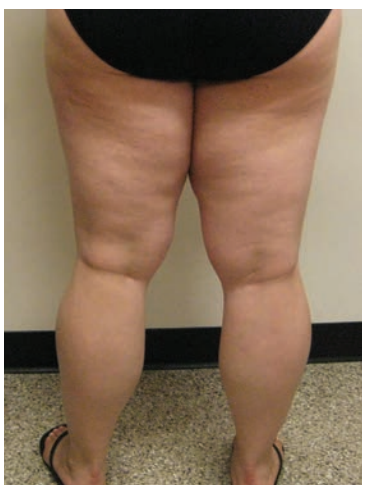
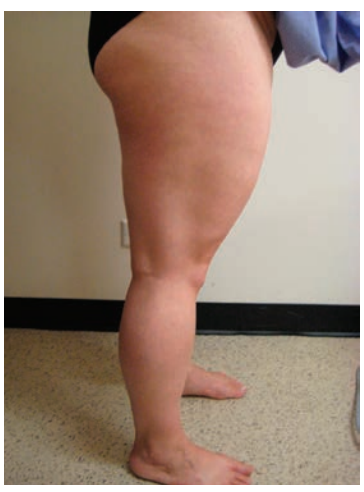
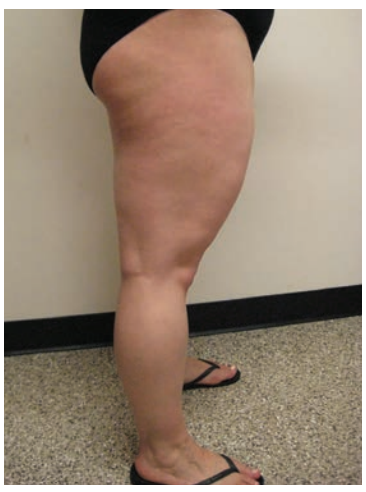
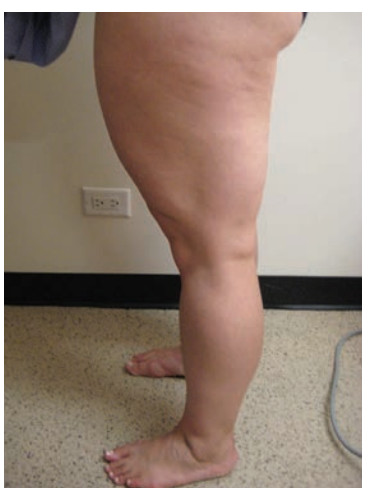
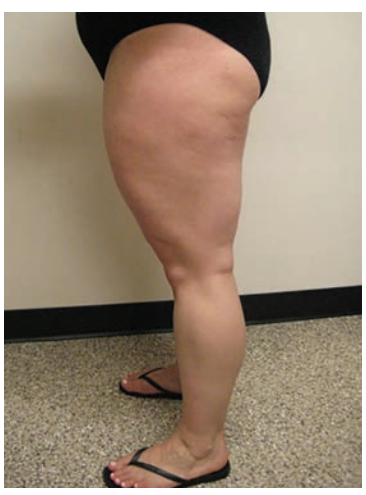
MARYELLEN TEDESCHI, ND, BSC (HONS)
YANA GUTMAKHER
ERIN TRUSCOTT-BROCK, ND

Cellulite is a normal physiologic change in skin texture, colloquially termed "orange peel" dimpling or "cottage cheese" skin for its topographical presentation of dips and valleys. Cellulite can occur in women of all races and is most notably seen in areas of higher fat accumulation, such as the abdomen, thighs, and buttocks. In males, fat is organized and supported by connective tissue that runs in a cross-cross pattern; this minimizes the appearance of cellulite. In females, that connective tissue runs perpendicular to the skin, which can result in a pulling and puckering of the skin.[1]

Cellulite affects 85-98% of post-pubertal females. It develops as a result of the following proposed factors/mechanisms: sexually dimorphic skin architecture; altered connective tissue septae, resulting in micro-nodules and adhesions that trap adipose tissue; vascular changes of the micro-capillary network in the fascia; and inflammation that causes metabolic changes resulting in hyperplasia and hypertrophy of the reticular network. The appearance of cellulite is exacerbated by increased skin flaccidity (where the skin is permanently distended and loose); greater thickness of the subcutaneous fat deposits; and/or venous or lymphatic insufficiency.[2]

Cupping, which is used for a variety of therapeutic purposes, is a traditional therapy incorporating the use of special plastic cups to create suction on the skin. This case study explores 6 weeks of heated cupping therapy to improve the look of cellulite on the legs and gluteal region of a 32-year-old woman.

Figure 1. **Before & After Photos**

Location	9/21/17	11/2/17
Anterior		
Posterior		
Right Leg		
Left Leg		

Case Presentation

YG is a 32-year-old female presenting with cellulite (beyond bound) bilaterally on the legs. Cellulite was most visible along the posterior gluteal fold. During the first visit a full history was taken, and a physical exam was conducted that included weight and measurements and photos of both legs (posterior, anterior, and lateral sides). (See Figure 1 for pre-treatment photos, taken on 9/21/17.) Outcome measures in this study were patient observations, photo comparison, weight, and measurements.

Measurements at Week 1 (prior to treatment):

- Circumference of right thigh = 71.5 cm
- Circumference of left thigh = 71.5 cm
- Circumference of widest part of buttocks = 160.5 cm
- Circumference of widest part of hips = 118 cm
- Weight = 194 lb

Treatment

Patient came in weekly for a total of 6 cupping treatments. A plastic suction cupping set was used, with medium-sized cups. For the duration of the 6-week treatment period, the patient maintained our recommended diet and exercise practices.

Areas treated included bilateral posterior thighs (gluteal fold to above the popliteal fossa, and avoiding the iliotibial [IT] band); gluteal muscles just below the sacrum; and bilateral anterior thighs including the IT band (greater trochanter to above the patella).

The treatment protocol, which was conducted once weekly from Week 1 to Week 6, involved the following steps:

1. Surface area to be treated was warmed with a hydrocollator heat pack for 5 minutes
2. Liquid coconut oil (1-2 tsp) was applied to the warmed area
3. One medium-sized cup was applied to the skin and pumped 1 time with a hand pump until 0.5-1.0 cm of skin was inside the cup (to patient's tolerance)
4. Brisk light circles were applied to the area to further warm and prep the skin
5. The cup was then moved in the same direction as muscle fibers around the entire area for 5 minutes
6. The cup was pumped 1-2 more times, to patient tolerance, once the area was thoroughly warmed up

Measurements at Week 7 (after 6 weeks of treatment):

See Figure 1 for post-treatment photos, taken on 11/2/17.

- Circumference of right thigh = 69 cm
- Circumference of left thigh = 69 cm
- Circumference of widest part of buttocks = 157.5 cm
- Circumference of widest part of hips = 118 cm
- Weight = 198 lb

Discussion

From Week 1 to Week 6 of treatment, there was a noticeable improvement in YG's pain tolerance during the treatment protocol. During Weeks 1 and 2, suction was only tolerated to 0.5 cm, whereas during Weeks 4 and 5 there was an increase in suction to 1.5 cm, and even 2.0 cm in the gluteal area.

Differences in measurements taken from Week 1 vs Week 7 were -2.5 cm in the circumference of both thighs, and -3 cm in the circumference of the widest part of the buttocks. Weight increased 4 lb from Week 1 to Week 7.

Although there are no obvious differences between the photos taken from Week 1 and Week 7, patient observations included noticeably smoother skin and increased flexibility of the lower extremities. The patient had experienced left-lower leg tingling for 2 years prior to the intervention and reported that the tingling lessened considerably during the treatment period. Due to the overall satisfaction and improved tolerance that the patient experienced during this 6-week protocol, we will be continuing treatment and tracking our progress for the next 6 weeks.

Maryellen Tedeschi, ND, BSc (Hons), is a new graduate from the Doctor of Naturopathic Medicine program at CCNM in Toronto. She is a naturopathic intern at the Robert Schad Naturopathic Clinic and Sherbourne Health Centre. Maryellen was first introduced to naturopathic medicine during her undergraduate studies at McMaster University in Hamilton, Ontario. After completing a placement in an integrative medical clinic and shadowing a naturopathic doctor, Maryellen knew that pursuing this career would allow her to follow her passion for providing holistic and individualized health care to others. Maryellen looks forward to providing patient-centered care as a naturopathic doctor in Hamilton in the near future.

Yana Gutmakher graduated from Michigan State University with a BA in Communication and Public Relations. She will graduate from the Canadian College of Naturopathic Medicine (CCNM) in 2019 with her Doctorate of Naturopathy. Following graduation, Yana hopes to practice in Michigan, with a special focus on connective tissue disease and women's health issues.

Erin Truscott-Brock, ND, completed her honours Bachelor of Science from the University of Toronto and continued on to the Canadian College of Naturopathic Medicine (CCNM), graduating in 2000. She has been in private practice ever since, working with patients of all ages and all concerns. Dr Truscott-Brock has been a clinic faculty member at CCNM since 2004, supporting 4th-year interns in their clinical practice. She is also active in NPLEX and is a co-chair for clinical writing. Dr Truscott-Brock is particularly interested in autoimmune diseases, neurology and head injury, gastroenterology, and endocrinology.

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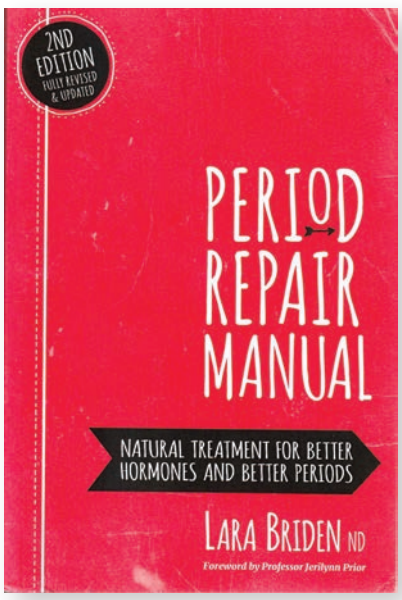

JASON KINLEY, ND

Period Repair Manual: Natural Treatment for Better Hormones and Better Periods

Being a male physician and never having had a menstrual cycle, I am always interested to learn from others about this amazing aspect of the human body. The *Period Repair Manual*, by Lara Briden, ND, has been a very insightful resource to do just that. Dr Briden does an excellent job of laying out how important this function is for women.

She begins in Part 1 by simply explaining the menstrual cycle ("Understanding Your Period"), and in a way that allows the reader to build on basic concepts; throughout the book she takes the reader into greater depth. I found a few points to be particularly important to share, as well as good reminders for myself: First, when a woman's cycles are not normal, her body is trying to tell her something. She may be the only one listening. Second, a woman's hormones *now* will set her up for her hormones *later*. Third, when a woman is on birth control and bleeds, it is not a real menstrual cycle.

Part 2 ("Treatment") moves the reader through treatments for various conditions including PMS, PCOS, menstrual irregularities, fibroids, and acne. She also explains how to get off of hormonal birth control. This is essential because without ovulation the body does not make progesterone. Dr Briden does an excellent job of helping women understand why ovulating is so important to their lifelong health.

Though the book is not anti-birth control, it provides the reader with in-depth information on how the various progestins in hormonal contraceptives are not the same as the progesterone made naturally by the body. In medical school we learn all about how the body is supposed to work, but there is little emphasis on women having a true ovulation and menstrual cycle. In my practice, I have already been able to use Dr Briden's book to improve patient outcomes by helping me look differently at the details of women's menstrual health.

I also appreciated how well she was able to anticipate readers' questions on certain topics discussed in her book. She then tells you which chapter to turn to once you are finished with a particular section. For example, in Chapter 5 she mentions endocrine disruptors but also how you can read more about the subject in Chapter 11. Throughout the treatment chapters she also discusses various nutritional applications and how they may benefit people who suffer from the various conditions. Magnesium, which she explains can help with PMS and exactly how, is only one of many examples provided.

This is a book that I have also recommended to several of my patients to aid in their understanding of why the natural occurrence of an ovulatory cycle is so critically important. It provides an easy-to-follow thought process for how to be a better detective for a woman's menstrual health. I also believe it empowers women to listen to their bodies and to demand physicians who will address their concerns regarding cycles and personal health.

Just the FACTS

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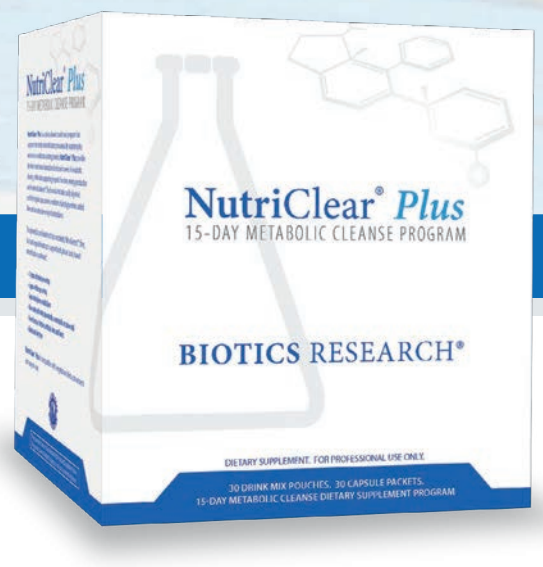

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The Milk Cure

SUSSANNA CZERANKO, ND, BBE

We now come to the question: "Ought milk to be drunk fresh or boiled?" The best and right way is, of course, to drink it as nature provides it, fresh; and experience has shown that fresh milk is more readily drunk, better tolerated and more easily digested than milk which has been boiled.

Benedict Lust, 1900, p.180

The milk cure is one of the most important weapons with which we can combat a whole series of chronic diseases.

Philipp Karell, MD, 1911, p.217

The milk cure is based upon Nature's most simple laws. It is adapted to all complaints of a chronic nature and is especially indicated in those ills having their origin in the digestive tract … consequent upon mal-assimilation of food and the resulting malnutrition.

Howard Hill, 1911, p.6

The search for the correct "diet" has been an unending merry-go-round that continues to entice and mesmerize our salivary senses. When new diets surface, we are quick to form opinions and make decisions, often trying them out. The rules of dietary wisdom tend to gather critics; and what's more, the rules are constantly changing. More often, there are as many voices castigating a diet as extolling its virtues. More than a century ago there was a popular diet called the "milk diet," which attracted more adherents than opponents.

I have encountered the milk cure numerous times and have ignored the milk diet, eschewing its use because of contemporary concerns about lactose intolerance and related issues. However, a recent conversation with a NUNM student, Anaheed Jackson, caused me to look again. Anaheed shared her story about a serious eating disorder and explained that fresh raw milk renewed her health and became a key food in her diet. Raw milk for Anaheed allowed her to reestablish a healthy relationship with food. Her story was the impetus for this article on the milk cure – a true pearl from the past.

Philipp Karell

The history of milk as a medicinal substance can be traced back to the days of Hippocrates. The early Naturopaths also valued milk's therapeutic properties. In 1911, Benedict Lust published a series of articles about a lecture by Philipp Karell, MD, the Imperial Russian Court Physician and Privy Counselor, who had practiced medicine for 34 years in the mid-19th century. Dr Karell had treated several-hundred severe and complicated cases using the "milk cure" and shared numerous cases to demonstrate the efficacy of the therapy.

Karell cites historical examples of how milk throughout the ages alleviated chronic diseases. Hippocrates recognized the milk cure as curative for consumption [tuberculosis], severe attacks of gout, sciatica, and leucorrhea in women. (Karell, 1911, p.218) The Greek physician, Galen, recommended milk for consumption and sent patients to Stabian Mountain, famous for its pastures and milk cure. (Karell, 1911, p.218) Friedrich Hoffmann, a Prussian physician from the 18th century, praised the excellent properties of milk, "especially donkey milk, being helpful in cases of chronic diseases, consumption, atrophy, podagra, gout and scurvy … by taking large quantities." (Karell, 1911, p.218) Numerous authors and physicians treated gout using the milk cure that worked magic. The French physician, S. A. Chretien, published in 1831 cases of dropsy [edema] that were treated using the milk cure. His successor, Serre d'Alais, gave "a report of more than 60 cases of different kinds of dropsy which he treated within five years and [had] resolved by the milk cure." (Karell, 1911, p.219)

In a 1900 article, Lust writes that milk was not an exclusive food for infants, but was useful as well for a wide variety of conditions. Lust cites milk as being effective "to increase a patient's strength, or to improve the condition of the blood and the humors by means of a somewhat more nourishing diet, as in convalescence after exhausting diseases, such as scarlet fever, diphtheria, typhus, etc.; also after painful deliveries; in scrofulous, rickets and consumption." (Lust, 1900, p.180)

Pasteurized Milk

The question of what kind of milk ought to be drunk showed up often in the Lust publications. Lust writes, "Experience has shown that fresh milk is more readily drunk, better tolerated and more easily digested than milk which has been boiled." (Lust, 1900, p.180) The apyrtrophers (those who ate "unfired foods") were adamantly opposed to pasteurization of milk. George Drews, author of *Unfired Food and Tropho-Therapy* (1912), saw cooked milk and foods as unfit for humans. When milk was cooked at high temperatures, such as pasteurized milk, it was seen as devitalized milk. Sterilized milk was even worse, because it had been subjected to greater heat. (Drews, 1916, p.119) In fact, the difficulty in finding fresh, unadulterated milk led people to turn to naturally fermented milk drinks.

The early Naturopaths contended that although pasteurization's goal was to make milk safer, this outcome was not entirely true. The process, named after Louis Pasteur, was intended to remove pathogenic bacteria by heating, with the goal of reducing transmission of diseases such as typhoid and tuberculosis. In this regard, William Utrecht writes, "We have eliminated the fresh milk from our diet because it is quite often dirty and filthy, and it is difficult to secure clean, fresh milk. In any case, pasteurization does not make milk clean. It is merely a heating process in which everything that is in the milk, including the dirt, is heated to 145°F/63°C and then cooled again." (Utrecht, 1928, p.60)

George Drews felt that pasteurization merely provided "dead food … fit for incubating scavengers, the bacilli and cocci. Warm dead milk is just the stuff that the tubercle bacilli like to feed on; for they do not feed on living tissue until it is dead." (Drews, 1916, p.119) Drews did not recommend pasteurized milk for

infants. He writes, "Pasteurized milk fed exclusively to infants, will produce rickets, constipation and finally, consumption." (Drews, 1916, p.120)

Sour or fermented milks fared better. "Natural milk allowed to sour will not putrefy, but if the milk has been pasteurized or sterilized, the germs of fermentation have been destroyed, which gives the germs of putrefaction a chance." (Drews, 1916, p.120) In his view, naturally soured milk was the more desirable form. "Thick and curdled milk can also be recommended. It is more easily digestible than fresh milk, because the first stages of digestion, the coagulation of the albumen, is already accomplished." (Lust, 1900, p.180) Sour milk alleviated constipation for those milk drinkers who suffered this complaint.

Milk Intolerance

Today, milk sensitivities are common and the milk cure seems out of place. We are familiar with milk allergies and sensitivities, and when Philip Karell and Howard Hill had patients complaining of adverse effects from drinking milk, they had a response for such people. In their view, flatulence, vomiting, and other digestive symptoms experienced during the milk cure indicated that the problem did not remain with the milk but rather with the presence of an unhealthy body. Hill writes, "No healthy stomach refuses Nature's first food, milk; this is positive proof of an unhealthy interior and shows how badly a 'house cleaning' is needed." (Hill, 1911, p.4)

Lust saw milk intolerance occurring when people with "weak stomachs" suddenly began drinking large amounts of milk, causing milk proteins to coagulate and form large, undigested clumps in the stomach. He recommended that people with weak stomachs drink milk by the mouthful and to eat a little bit of bread at the same to prevent coagulation. (Lust, 1900, p.180)

Our early naturopathic doctors observed that the relationship between digestive imbalance and the emergence of chronic diseases was interrelated. Another author on the milk cure, Howard Hill, writes in the first paragraph of his booklet, "There is little doubt but what most of our bodily troubles, other than those arising through accident, have their origin in the digestive tract, or alimentary canal. They are due to a clogged system, brought about by overtaxing the digestive organs 1) with too much food, and 2) with improper foods—foods that don't nourish or that yield only a minimum of nourishment, the result being an excess of uric acid which irritates the mucous membrane of the stomach and intestinal tract, and being taken up by the blood gradually poisons the entire system." (Hill, 1911, p.1) The seat of disease located in the digestion was a familiar moniker of the early Naturopaths, and digestive diseases continue to baffle medicine today.

Milk was viewed as Nature's "perfect food," providing every element. Those who used the milk cure were effusive about the merits of the milk diet. Karell's use of the milk cure was incredibly successful, especially in cases that defied medicine. He writes, "I can state as a fact according to my own experiences that the milk cure surpasses all the other means of treatment which are known to me, in all cases of dropsy, in asthma, … obstinate neuralgia, which came from the abdomen. (Karell, 1911, p.220)

Karell's Milk Cure

Karell's instructions to patients beginning the milk cure was to abstain from all foods other than milk. We must keep in mind that Karell lived before pasteurization and that milk drunk in the milk cure would have been raw and from healthy cows. No GMO, no Roundup, no pesticides, and no body burden consisting of today's taxonomy of over 100 000 chemicals existed a century ago. Milk was considered healthy if it could be obtained from healthy cows.

His prescription to the sick was to take half a cup or a whole cup (60-180 g) of skim milk 3 to 4 times daily, at fixed and strictly observed intervals. (Karell, 1911, p.296) Milk was drunk slowly to give the salivary enzymes an opportunity to act. Karell was strict about when milk was taken and did not adhere to a casual regimen of drinking as much milk as one wanted. Instead, he counseled his patients to leave 4-hour intervals between each milk intake, preventing any over-burdening of the stomach. He writes, "I always adopt the rule that the sick patient take his ration at 8 a.m., at noon, at 4 p.m. and 8 in the evening." (Karell, 1911, p.296) One point stressed by Karell, as patients began the milk cure, was that milk portions be small and increased gradually.

> Milk was considered healthy if it could be obtained from healthy cows.

The patients Karell presented were long-time sufferers for whom all the available medical interventions that were tried had failed. When these patients came to Karell, they had used up all of their options and milk was their last hope. The milk cure was conducted for several weeks and often continued after a cure.

Karell's extensive experience using the milk cure revealed that combining the milk cure with other foods resulted in less than desirable results than the exclusive milk fare. If patients became thirsty on the milk cure, water was permitted. If patients became tired of the liquid diet and craved solid food, in the second or third week dried rolls could be taken at the 4 PM mealtime. (Karell, 1911, p.297)

Constipation was often experienced by patients beginning the milk cure, which was a good sign. If the constipation became obstinate, Karell suggested boiled prunes or a roasted apple. An enema could also be administered. If the bowels rumbled and diarrhea occurred, the milk was either too fat or too much had been consumed. (Karell, 1911, p.297) If a patient vomited bile and mucous, it was thought that the products of mal-assimilation, which the milk simply stirred up, were being evacuated. (Hill, 1911, p.5)

Patient Cases

Case of Vomiting

Karell recounts a case of a woman who suffered for 4 months from vomiting and diarrhea caused by chronic bowel inflammation. He found her extremely emaciated with an adipose liver, and she had a past history of long-term menorrhagia and hemorrhage of the gut. He directed the woman to take 4 tbsp of skim milk 3 times per day, with no other food to be taken. "The vomiting stopped at once, the diarrhea at the third day, the stool became more formed and of such an appropriate quantity as had not been the case for years, and at the end of the second week the woman drank two bottles [of milk] daily." (Karell, 1911, p.297)

Case of Angina

A 67-year-old man presented with angina pectoris, and for many years had also suffered from vertigo. He presented with shortness of breath, catarrh of the lungs, and edema in the legs and feet. On examination, the man had accelerated superficial breathing, abnormal heart sounds, an enlarged abdomen, a pulse over 90, and his tongue was intensely red with two yellow stripes in the middle. The patient was unable to lie in a horizontal position at night, thus needed to sit upright in bed. He experienced shooting pains in the left side of the chest and in the region of the heart, and urination was sparse and dark in color. (Karell, 1911, p.362)

The patient had tried all known remedies without success. The man's physician exhausted his options and had consented to the milk cure, which Karell administered. After 5 weeks, the urine discharge increased, relieving the edema of the legs; heart sounds returned to normal. "From the sixth week the patient received three times a day milk and once another fitting meal. About eight weeks later, the man was in his pulpit and … enjoys perfect health." (Karell, 1911, p.363)

Other Disorders

The literature reports that Dr Karell's successes with the milk cure were exceptional in cases of anemia, edema, rheumatism, obstinate weakness in the digestion, and, in particular, gout. (Karell, 1911, p.433) The milk cure was especially effective and indicated in any cases that were overshadowed by a defective digestion. Charles Porter, MD, used the milk diet to reduce high blood pressure, normalize body temperatures in anemic patients, and normalize body weight in both the underweight and overweight. Before commencing the milk cure, Porter would prepare patients with a preparatory fast. "After the preliminary fast, most patients should be put to bed, and take the milk diet while resting as completely as possible, mentally as well as physically." (Porter, 1917, p.309)

Porter, like Hill and Karell, had much to say about the milk cure. These clinicians all claimed impressive clinical successes. Porter had over 32 years of experience with the milk diet and listed over 40 diseases, including obesity, colitis, neuralgia, Bright's disease, early stages of consumption, goiter, paralysis, leukemia, and Addison's, etc. (Porter, 1917, p.310)

Critics

Not everyone shared the views of those using the milk cure. One such man, Dr J. A. Adams, a Naturopath, wrote to Benedict Lust, the editor of *the Naturopath and Herald of Health*, with disappointment and criticisms. Personally experimenting with the milk diet on 3 occasions, Adams found that the drinking of copious amounts of milk caused his body to perspire profusely and that he smelled like "a cheese factory." (Adams, 1911, p.529) Although, he had recommended the milk diet to patients, he was not comfortable with the difficulty of executing such a diet. Adams was a vegetarian, and milk as the only food item in a diet seemed brutal.

Milk, Nature's Perfect Food

Hill states that "milk is one of the most wonderful of all Nature's products in being not only a perfect food in itself containing every element of nutrition that even the adult human body requires in its purest form, but being entirely free of uric acid, is also a potent remedy for all kinds of chronic maladies." (Hill, 1911, p.2) A century ago, uric acid was one of the targeted evils in medicine. High levels of uric acid were associated with gout, edema, kidney diseases, and hypertension. Gout was common in the early 20th century, and – unknowingly – those using the milk cure had an ideal protocol for treating gout.

What Dr Karell and his contemporaries did not know is that milk contains proteins such as casein and lactalbumin, which has been found to cause the excretion of uric acid. Another protective element found in milk is orotic acid, which decreases the reabsorption of uric acid by promoting its excretion by the kidneys. Early research identified orotic acid as vitamin B13, and more recent findings have established orotic acid as ameliorating gout. (Loffler, 2016, p.566)

The benefits of the "milk cure" continue to be discovered and revealed to the contemporary naturopathic doctor as well.

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Historical Savvy

Its Dearth Hurts

DAVID J. SCHLEICH, PHD

Quite recently I was in Butler, NJ, to confer with local leaders about the huge importance of their little town in our history. Painfully, the only fragments of that special period of Jungborn and the early growth of naturopathy in the Northeast, were 2 small postcards lost in a binder. An expedition into the hinterland of the town – where hundreds of patients came (often from NYC) for naturopathic care, and from whose clinical experiences arose a robust literature about the therapeutic order and natural approaches to health and healing – led us to an abandoned, small valley in the Ramapo Mountains of northern New Jersey. The earlier grounds of Jungborn were bifurcated long ago by a highway. The small river, dam, and walled pond on the grounds, so central to hydrotherapy and other modalities at Jungborn, were overgrown and in abject disrepair. Only the tiniest sprinkle of people living in Butler has any inkling of the astonishing history of that space. Shucks.

George Bernard Shaw famously warned us, as only he could frame such a sentiment, that "we learn from history that we learn nothing from history." At the same time, George Santayana, the philosopher and poet, equally adept with rhetoric, has something more optimistic to share, that "those who fail to learn from history are doomed to repeat it." There exist rich categories in the literature of the history of medicine that our teachers are doing their best to keep top of mind in curricula for the modern era. There are lessons in that history which can definitely help in the current confusion about naturopathic medicine's legitimate place in the legitimized medical systems in North America.

I'm referencing here not only remarkable achievements, such as the Foundation of Naturopathic Medicine's TIMELINE, but also systematic study of several strands weaving and hurtling through the history of medicine. When we look closely at the most important aspects of the evolution of medicine, and concomitantly conjugate naturopathic medical education's record and current trajectories through that record, it's the historical data and analysis that emerge as wonderfully instructive in navigating the vicissitudes of political, philosophical and economic rivalry. Lessons learned from our history can help our academic leaders and teachers make better sense of that knot of political, social, and epistemological roots which swirl around, manifesting in today's regulatory, educational, clinical and research challenges.

Learning from Our History

Our naturopathic educators can benefit from understanding the patterns that show up in the historical record of generic medical education. There are parallel paths between the ascendancy of the allopathic professions in civil society and the form and content of medical education that got them there. Key categories from the literature can yield valuable insights:

- the teaching of anatomy
- the evolution of bedside teaching and apprenticeship within a professional curriculum
- the last century's rush toward new forms of medical teaching
- the ever-expanding routine of medical education
- the place of social determinants in medical practice

One who has broadly studied the history of medicine can attest to the substantial and enduring value of the scholarship of medical history, indeed to its very language. Immanuel Kant was so right when he wrote about the density and interdisciplinary interrelatedness of content. Sensing such patterns help us to discern not only momentum, but also what Kant described as "a regular movement" in that continuum. It is complex terrain and often feels chaotic, repetitive, and even exasperating. A high-altitude perspective, though, reveals a steady progress in the end. Translation: the naturopathic profession is in better shape epistemologically and politically than it has ever been. All of our detractors wouldn't be so vociferous were that not so. And, the internal conflict between "drifting to allopathy" and honoring our "traditional roots" is a symptom, not of a wretched, expanding schism, but of a yearning, like a river for the sea, for continuity and balance in theory and practice. Thought leaders among the allopaths know the jig is up and that they must learn from their history. They too see the cumulative impact of research yanking them out of a reductionist paradigm into a more holistic one. The recent Functional Medicine international forum in early November 2018 in London, for example, had as its theme, the "evolution of medicine," focusing directly on the need for integrating professional medical systems, modalities, and philosophies. Tough, ongoing work.

During worried moments when I witness the unrelenting bruising efforts of our critics, I am reminded of Machiavelli's dictum, that "human events ever resemble those of preceding times." Close reading of the events, people, institutions, and organizations in the naturopathic story will point out the greatest aspect of our history and contribution to the medical profession, that we have been more moral than scientific at times, and that both are strong in our brand, in our identity, and in what our graduates end up doing out in the world year after year. By knowing more about who we were once, and how we got to the present, we are less strangers in the strange land of integrative medicine dominated by orthodox systems, and instead are on more familiar ground. We become more skilled in building our future, having learned from what we endured, especially when we face the unrelenting guild behaviors of the allopathic enterprise and its partners in high tech and pharmacy as they plop obstacles in our path.

Whatever we keep on doing to keep naturopathic medicine robust and relevant, every plan along the way must be informed by what Socrates once called "these several actions with the whole soul." Specifically, and if we know our history, the "whole soul" of naturopathic medicine cannot be as easily slammed by the reductionist approach to medicine which conveniently forgets and forgives bloodletting and calomel in the same breath as it enables an opioid pandemic.

The at-once highly complex and beautifully simple principles of the medicine are increasingly of interest to healers across the professions. In our work to form the profession, there are 3 imperatives:

1. the establishing and accrediting of our educational preparation for practice
2. the recognition of our graduates by civil authority
3. the codifying of our knowledge, secure in its derivation, relevance, and application

Let us turn briefly to those historical benchmarks to see how we're faring…

Persisting Approaches in Medical Education

Medical education in the 19th century was as much about "moral and intellectual discipline" as it was about professional preparation. As Lisa Rosner puts it, "Education made a good man, whereas medical improvement made a knowledgeable doctor." (Rosner, 1997, p.147) The depth of information arising from the early research and teaching of Vesalius, Harvey, and von Haller, for example, was not meant for the exclusive use of the medical doctors of their time. As Rosner points out, "medical knowledge was universal." The historical literature shows that from the Renaissance forward, anatomy was a central subject. By the end of the 17th century, bedside clinical experience joined anatomy as essential in medical education. Hermann Boerhaave, a prominent late-18th-century "medical man" at the University of Leiden, routinely delivered clinical lectures in the tiny ward of St Caecilia hospital (12 beds). This model, more theoretically fashioned than practical, was soon transformed into an apprenticeship design in which medical students were often legally contracted to a "master." That "attending" doctor, in turn, was a member of the local doctors' guild, and thus the apprenticeship led to entry to practice. The pattern we see historically is familiar today in our own naturopathic medical education:

> *The first few years [of a medical apprenticeship] are mostly spent doing small tasks and waiting at table*

Thought leaders among the allopaths know the jig is up and that they must learn from their history.

> *… until [the apprentice] gradually becomes accustomed to wielding the razor, opening veins, applying plasters and at most bandaging a wound or fracture … and [seeing on occasion] a few operations performed by his master.*
> *(Rosner, 1997, p.149)*

New forms of medical teaching appeared in university contexts (eg, Leiden, Edinburgh, Philadelphia, Gottingen, Pavia, Ingolstadt, Stockholm), most of which we recognize as part of naturopathic medical education structure in our own era. Differentiated "disciplines" emerged (anatomy, surgery, chemistry, botany, physiology, pathology, hygiene, dietetics), since no one "medical man" could master them all. Boerhaave's dozen beds gave way to universities linking up to hospital wards for instruction … so-called "hospital schools," the most famous of which were in London. Significantly, the allopathic profession effectively blocked naturopathic medical students from such resources very early on, and persisting well after Flexner; the blurring of "science" with "art" also expanded sharply.

Then came what Schon (1987) has described as prototypical profession education (specifically, basic sciences followed by applied sciences followed by a practicum). As this model expanded, its cost grew exponentially. Enter government and professional bodies and the rapid rise of regulation and control. Alongside this development came, especially in France at the time, the emergence of 2 different kinds of licenses: the doctorate in medicine [only available at approved medical schools] and the "license for *Officiers de Santé*." Bifurcation arose from the latter, say, the Heilpraktiker category in Germany and the relegation to "public domain" of certain health providers in America who were excluded from mainstream licensing and credibility as regulation took root and university study coupled with the standardizing of curriculum and assessment. It isn't hard to see how the orthodox group see themselves as the real deal, and all heterodox providers as subservient.

The Rise of Basic Medical Sciences

The history, then, sheds light on why we have had such a time establishing, say, the CNME, state and provincial licensing, access to state funding for students (Title IV and Stafford loans, for example), and so on. Factored into this dense terrain is the rise in importance in medical education of the basic medical sciences, the skills and content dimensions of which are assumed in the naturopathic profession's own curriculum design. We joined that process, emulating, for example, the explosion in volume, as well as in breadth and depth of specific training. As a benchmark, Stanford University Medical School grew its curriculum dramatically at the same time as the naturopathic profession hung on in the Pacific Northwest. Stanford added 900 hours to the 4-year medical course, between 1945 and 1960. Each new course, taught by a specialist in the field in the tradition established in the 18th century, attempted to provide students with all a practitioner needed to know.

Inevitably, high-end scientific training took precedence over clinical work for allopathic students. The naturopathic profession prided itself in applied knowledge (manifesting in the long tradition of "elders" who tutored and mentored, often as volunteers, in our fledgling schools in that era). Clinical training became increasingly difficult to access for naturopathic students because the larger context of medical education precluded them from teaching hospitals.

Once again, history teaches us that we have good instincts. As Rosner points out,

> *Even if clinical training is carried out effectively, a university hospital does not truly prepare students for what they will experience in practice. Patients in a university medical centre are often there precisely because they have serious or unusual ailments; in treating them, students learn little about the most common ailments.*
> *(Rosner, 1997, p.158)*

One can connect the dots, with such an historical perspective, to the affinity naturopathic professionals have in states with more robust "licensing" for primary-care physician status. This is despite the accompanying challenge of needing to access high-tech medical centers in order to utilize labs and procedures and the challenge of how to balance prescriptive rights with abhorrence for the dangers of pharmaceutical invasiveness.

Naturopathic professionals worry that treating the patient as a whole human being, that the role of social determinants in understanding presenting conditions, and the power of the third-party reimbursers in defining appropriate care, are eroding the principles which Lust and others in Jungborn a century ago tried for many years to emphasize.

We circle back, then, to the notion that naturopathic professionals continue to see themselves as holding ground that is more moral than scientific; yet, the latter descriptor is increasingly essential in the healthcare landscape, sometimes, though, at the expense of the former. The allopathic profession has protected itself strategically from charges of moral failure (eg, iatrogenic disease, the vaccination debate); however, many of its members understand that their own history has lessons for them too.

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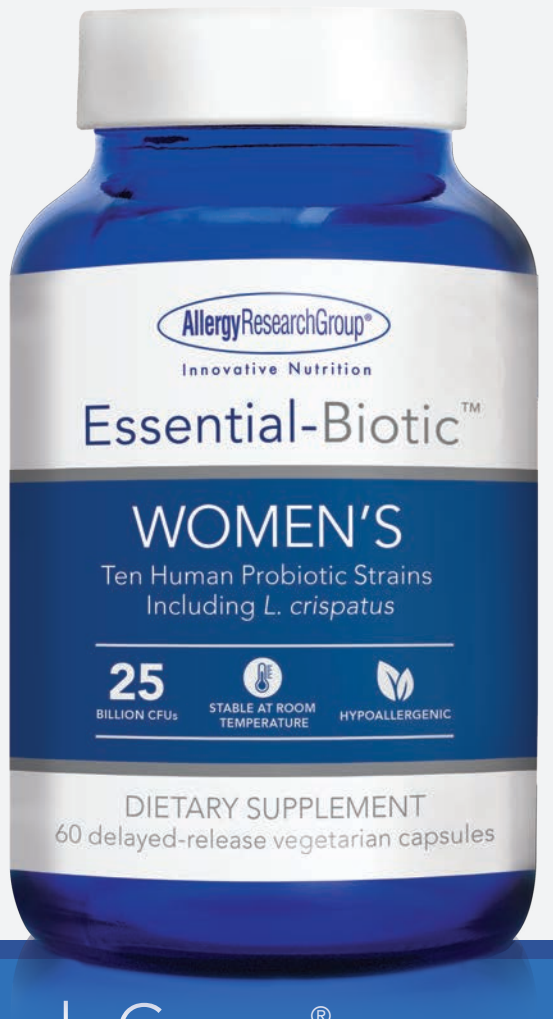

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