

Integrative Health and Wellness Coach-Psychiatrist Intervention for ADHD: Case Report Using CARE Guidelines

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BACKGROUND: Attention Deficit Hyperactivity Disorder (ADHD), previously considered a childhood disorder, is increasingly recognized as continuing into adulthood, impacting approximately 4.4% of adults (Kessler, Adler, Barkley et al., 2006). Stimulant medications are the most common treatment for ADHD. However, medications often do not address functional and behavioral aspects of this condition (Catala-Lopez, Hutton, Nunez-Beltran, Page, Ridaio, Macias Saint-Gerons et al., 2017). As indicated by at least 19 studies to date (Ahmann, Saviet & Tuttle, 2017), coaching—an emerging science-based, client-centered behavioral intervention—can assist individuals with ADHD in addressing functional and behavioral challenges.

Using the CARE guidelines (<http://www.care-statement.org/about>), this case report is based on a systematic review of data collected from the point of care with an ADHD-focused health and wellness coach collaborating with a psychiatrist in support of a client with ADHD. This is the first case report describing collaboration between a psychiatrist and a health and wellness coach in managing ADHD.

CASE DESCRIPTION: The client, a young woman, was on academic probation in a graduate-level academic program, struggling due to poorly managed ADHD. Medication treatment prescribed by her psychiatrist was not sufficient to manage the functional aspects of her ADHD. The disability office in the young woman's school recommended coaching.

This report describes client improvements in ADHD management generated over a 6-week health and wellness coach-psychiatrist collaboration. The coaching interventions included use of a variety of coaching instruments, skills, and strategies that will be outlined. They supported the client in achieving the organizational and life skills that allowed her to resume graduate school.

Integration of coaching with the psychiatrist's medication support, over a six-week period, resulted in meaningful improvements for the client, in areas including academic achievement, personal growth, self-efficacy, daily functioning, organizational skills, inter-personal skills, and self-care. At the end of six weeks, the psychiatrist submitted a letter outlining these improvements to the client's academic program, and the client was allowed to resume her graduate studies. This was the most important outcome from the client's point of view. Follow-up conversations between the coach and client indicated that she maintained her gains over a several month period.

CONCLUSION: An integrative approach, consisting of collaboration between a health and wellness coach, psychiatrist, and client, resulted in a successful intervention for improved management of the client's functional and behavioral ADHD symptoms. These changes contributed to the client meeting her goal of being permitted to resume her graduate studies.

Concurrent Treatment of Low Back Pain and Recurrent Grief Using Worsley Five Element Acupuncture: A Case Report

Campbell J.

BACKGROUND: A 46-year-old female presented in April of 2017 with chief complaints of severe pain across the low back (rated 8-10/10) and ongoing grief with daily crying spells as a result of the deaths of 11 family members over a 10-year period ending in 2008. She also noted a history of ganglion cysts, mild depression, hypertension, edema in both feet and ankles, hemorrhoids, constipation and slight right shoulder pain. In 2011, she was diagnosed with degenerative discs in L3-L6 with mild arthritis.

CASE DESCRIPTION: Based on Worsley Five Element theory, certain blocks to treatment should be cleared at the beginning of treatment in order to speed deep healing for the patient and avoid the suppression of symptoms. Using the Five Element objective diagnostic skills of visual, auditory, olfactory, sensory and tactile observation coupled with the patient's subjective report, the existence of two such blocks was diagnosed. These indicated the need for the first two treatments: Internal Dragons to address the chronic grief and Aggressive Energy to clear any residual pathogens from the body. These were then followed by four more treatments to support the patient's constitution (her primary strength and primary weakness) for a total of six treatments in all. The back pain was tracked each week on a 1 to 10 patient reported scale, as was the grief. The crying episodes were numerically documented each week as well. All decreased incrementally as treatments continued. After the fifth treatment, the patient reported a complete cessation of the back pain, the grief, and crying episodes. She also reported a renewed sense of gratitude.

CONCLUSION: Five Element Acupuncture should be considered as a cost effective, efficient, and non-invasive form of treatment for those suffering from concurrent physical and emotional pain.

The pH of Medicinal Herbal Teas: A Research Design

Freeman C.

BACKGROUND: Acidic beverages cause dental erosion via chemical dissolution of enamel. Previous studies have shown that beverages with a pH < 4.0 lead to dental erosion. A recent study published in the Journal of the American Dental Association (2016) investigated the pH of commercial beverages so that dentists could accurately assess the risks associated with consuming these drinks. Although some pre-packaged herbal teas were included in this analysis, data on the pH of commonly used medicinal teas prepared via traditional methods is not available. Understanding the pH of medicinal herbal teas may benefit consumers, dentists, herbalists, and other integrative healthcare professionals.

RESEARCH OBJECTIVE(S): This study will determine the pH of ten commonly used medicinal herbal teas prepared using traditional methods.

METHODS: The herbal teas under consideration are *Avena sativa*, *Calendula officinalis*, *Hibiscus sabdariffa*, *Metha x piperita*, *Rosa carina*, *Sambucus nigra*, *Taraxacum officinale*, *Schisandra chinensis*, *Stellaria media* and *Zingiber officinale*. Herbs were selected based on data from Dr. Duke's phytochemical and Ethnobotanical Databases indicating that they are high in citric acid, oxalic acid and/or malic acid. Herbs were limited to those that are commonly used medicinal teas in the author's experience.

Each herb will be obtained cut-and-sifted in bulk from two commercial sources with verified certificates of authenticity. Three samples will be prepared from each source in the following manner: 100 ml of boiling distilled water will be added to 5 g of dried herb. After a 20-minute infusion (a traditional preparation), the herb will be strained from the tea and the infusion cooled to 37 degrees C. pH will be tested in triplicate at 37 degrees C with an electronic pH meter. Calibration of the pH meter will be tested using a known solution before testing begins. Individual data points and the mean will be presented for each sample.

DISCUSSION: This study aims to identify the pH of medicinal herbal teas to inform both clinicians and consumers of potential concerns. The finding that some or all teas have a pH above four would also be of interest. In this case, consumers and practitioners could feel confident that these traditionally prepared herbs were unlikely to contribute to dental erosion according to ADA parameters.

Low-cost Microbial Testing of Botanicals for Small Herbal Businesses: Design and Rationale

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BACKGROUND: Small herbal businesses face costly challenges to comply with FDA's Good Manufacturing Practices (cGMPs). Current testing for common microbial contaminants in the food industry occurs in sterile, microbiological laboratories equipped with biological safety cabinets, autoclaves and incubators. Smaller companies generally send their product to analytical testing labs that specialize in microbial testing, which can be costly. An alternative methodology that requires minimal training and equipment to test for microbial contamination of herbal products would reduce financial burden.

RESEARCH OBJECTIVE: This study aims to replicate laboratory conditions necessary to conduct microbial testing using aseptic techniques and a Bunsen burner to create a sterile field without using biological safety cabinets.

METHODS: The study will test the microbial levels of *Echinacea* herbal tinctures using aseptic techniques, including the use of a Bunsen burner, in order to create a sterile workspace in the MUIH Herbal Dispensary and three residential kitchens (referred to as BBM samples). Identical samples will be tested in the microbiology laboratory at JIFSAN. To account for differences in hydroalcoholic concentration ratios, *Echinacea* extracts at 45%, 50-60% and 95% alcoholic strengths will be used. Samples will be tested for total aerobic count, *E.coli*/Coliform, and yeast/mold levels using 3M™ Petrifilm™. At the four testing sites, three replicates of each *Echinacea* sample for each petrifilm will be tested. The BBM participants will be trained to ensure that proper protocols and aseptic techniques are followed.

A portable Bunsen burner will be used for testing at MUIH and the residential kitchens to properly sterilize sampling instruments and to create a sterile column of air in the workspace. The Bunsen burner creates a convection current where the heated space above the flame lifts any particulates away from the cooler air underneath. All samples will be inoculated at room temperature. Inoculated JIFSAN samples will be incubated at $35\pm 1^\circ\text{C}$ for 48 ± 3 h except for yeast/mold petrifilms ($25\text{-}28^\circ\text{C}$ for 48 ± 2 h). Inoculated BBM samples will be stored at the indicated times and temperatures and analyzed accordingly. After analysis, inoculated Petrifilm will be soaked in a 10% bleach solution for 1 h to kill any bacterial/mold growth and discarded with regular waste.

DISCUSSION: The development of a microbial testing method requiring minimal training and low-cost laboratory equipment that can be performed in a non-laboratory setting would benefit small herbal businesses efforts to comply with cGMPs. This experiment would help in developing a validated method for use by industry.

Dietary/Supplemental Omega-3 Fatty Acids in the Amelioration of Generalized Anxiety Disorder Symptoms: A Narrative Review

Higgins C.

BACKGROUND: According to National Institute of Mental Health, anxiety-related disorders are the most prevalent psychiatric disorders among general population, over 40 million adults have anxiety disorders, and 6.8 million with Generalized Anxiety Disorder (GAD). Research shows dietary fats, specifically long chain polyunsaturated omega-3 fatty acids (n-3 L-PUFAs), play a major role in mental health and have neuroprotective effects. Also, individuals with low n-3 L-PUFA levels, or an imbalanced omega-3 to omega-6 (n-6) ratio (prevalent in the Standard American Diet), are at higher risk for anxiety and other mood disorders. If correction to the n-3:n-6 ratio and increase in n-3 L-PUFAs lowers neuronal inflammation, dietary and/or supplemental consumption may improve GAD symptoms.

RESEARCH OBJECTIVE(S): I sought to review relevant literature and answer whether increasing dietary/supplemental n-3 L-PUFAs ameliorates or prevents the onset and/or presence of GAD symptoms.

METHODS: PubMed was the only database searched; 103 quantitative studies were selected after search parameters were carefully chosen to sort and exhaust the literature using specific search strings: "PUFA" AND "Anxiety disorders", "Omega 3 Fatty Acids" AND "anxiety", and ("Anxiety Disorders" [MESH]) AND "Fatty Acids, Omega-3" [MESH]. Twenty-one studies were considered thoroughly relevant.

RESULTS: Overall, study quality was medium to high for 21 articles using the PRISMA guidelines; and all but one study showed evidence to support the beneficial effects of dietary/supplemental omega-3 fatty acids. One RCT concluded that supplemental fish oil does not reduce chronic inflammatory biomarkers in healthy individuals. The quantitative research of 20 articles show that boosting n-3 L-PUFA intake decreases inflammation, thus lowering the onset of mood disorder symptoms; three studies even suggest implications of GAD prevention. Eight studies' major focus was Major Depressive Disorder (MDD), MDD and anxiety disorders are often comorbidities with similar treatment therapies, suggesting a common neural pathophysiology. Currently, more definitive research of MDD exists than GAD overall, however, current literature shows the beneficial effects n-3 L-PUFAs have on lowering anxiety, reducing stimulation of pro-inflammatory cytokines, and modulating chronic stress response.

CONCLUSION: Research suggests that n-3 L-PUFAs have lasting beneficial effects on neuronal health, decreasing system-wide inflammation, thus improving symptoms. Large samples of experimental data to support the anxiolytic benefits of supplemental and/or dietary n-3 L-PUFAs is still lacking; however, n-3 PUFAs are reduced in those with diagnosed anxiety, and supplementing can target specific pathways involved in GAD symptoms. Larger sample sizes are required to better analyze therapeutic doses and treatment potential of n-3 L-PUFAs.

Acupuncture Diagnosis to Direct Self Care as an Alternative Therapy for Seasonal Allergies: A Case Report

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BACKGROUND: In 2010, seasonal allergic rhinitis (SAR) affected more than 50 million people in the US resulting in 16 million doctor visits, a loss of 6 million work/school days, and a cost of \$17.5 billion. Many patients report being dissatisfied with the effectiveness of standard care, which includes over-the-counter antihistamines and topical steroid sprays. This case report examines acupuncture and self-care for treatment of a pediatric patient with SAR.

CASE DESCRIPTION: A six-year old female patient presented with SAR in March 2016 and was treated with Allegra® (fexofenadine), and a nasal steroid spray. In the weeks that followed, she developed impetigo followed by a skin rash, and acute symptoms of swollen lips and tongue. Her conventional treatment during this time included several trips to the pediatrician, one emergency room visit, and the pharmaceuticals Benadryl® (diphenhydramine) cream, an antibiotic, and prednisone.

The patient discontinued all medications. After three acupuncture treatments and self-care instructions that included lifestyle recommendations to reduce stress the patient's skin and sinus symptoms resolved. Acupressure and essential oils including peppermint, ylang ylang, and orange were administered at home to sustain the benefits of treatment as needed. The patient returned for treatment every one to three months, for a total of eight treatments between May 2016 and September 2017 and she remains symptom free.

Acupuncture diagnosis was based on Oriental medical pathophysiology, which included a diagnosis of the patient's temperament or constitutional type. The patient's response to acupuncture treatment was used to verify the acupuncture diagnosis and to inform self-care instructions.

CONCLUSION: This case report demonstrates the clinical reasoning behind acupuncture therapy for a patient with SAR, suggesting that a combination of acupuncture and self-care may provide an effective therapy at a low cost and with no adverse side effects.

Rationale and Study Design: Traditional Healing Practices and Medicinal Plants for Treating Major Diseases in Liberia

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BACKGROUND: During the decade-long civil war, most of the Liberia's infrastructure was destroyed or severely impaired, including the healthcare system. The government's goal is to rebuild a Western healthcare infrastructure and integrate traditional healing into this framework. Unfortunately, very little research has been done on traditional healing practices and medicinal plants in Liberia. The goal of this research study is to codify the history and contemporary use of traditional medicine practices and medicinal plants in rural areas focusing on five of the ten major diseases in Liberia.

RESEARCH OBJECTIVE(S): The study will attempt to achieve the following objectives: 1) create a lexicon of traditional healing symptoms, diagnosis and therapeutic approaches for five major diseases; 2) archive medicinal plants used to treat these major diseases as well as the harvesting and processing practices; and 3) build a traditional healers directory for future research.

METHODS: This mixed method research project has two phases. The first phase consists of informal one-on-one interviews with 30 traditional healers; two from each of the 15 ethnic groups. Purposeful sampling will be employed to recruit healers in partnership with the Traditional Council of Liberia and the Sande and Poro Societies. The interviews will focus on: a) diagnosis and treatment of the five diseases; b) materia medica; c) treatment beliefs and values; and d) medical training. The second phase of the project focuses on photographing and identifying the medicinal plants in situ as well as a discussion about harvesting and processing. All the interviews will be recorded and transcribed. In order to build the sampling frame, quantitative data will be collected on all traditional healer referrals beyond the study target. Data collection will be done using the Open Data Kit (ODK), a mobile digital data platform. Analysis of the data will be conducted utilizing content analysis software such as Atlas TI or Dedoose.

DISCUSSION: The author is unaware of any study that directly addresses traditional practices and plants used to treat some of the major diseases in Liberia. This project will be conducted in alignment with the cultural values and customs of Liberian traditional societies. The findings will provide critical data that will inform a wide range of policies around healthcare and plant conservation, as well as guide future clinical and research efforts.

Effect of Gardening-Based Nutrition Education Interventions on Childhood Obesity and Fruit and Vegetable Intake: A Narrative Review

Kuziel S.

BACKGROUND: Childhood obesity is a complex issue in the US affecting approximately 17 million children and adolescents (Ogden, Carroll, Fryar, & Flegal, 2015). Many nutrition-focused educational interventions have been implemented to make an impact on not only obesity rates among children, but also obesity-related nutrition behaviors, such as fruit and vegetable intake (FVI). Gardening-based nutrition interventions for children are increasingly becoming a part of a holistic approach to childhood nutrition education. But are these programs effective at changing FVI and lowering obesity rates among children?

RESEARCH OBJECTIVE(S): The aim of this narrative review is to examine the effectiveness of gardening-based nutrition interventions for children in the US at increasing FVI and lowering obesity rates.

METHODS: PubMed (accessed through the Sherman Cohn Library) was searched using the following terms: “gardening education children obesity” and “gardening education children fruit vegetable intake.” The inclusion criteria for articles are 1) US population; 2) Study population is children (under age 18); 3) Gardening is a major component of the intervention; 4) Outcomes measured are FVI and/or obesity; 5) Quantitative study; and 6) Studies are no more than 10 years old (published between 2007-2017).

RESULTS: Twenty-eight studies were identified by the first search term and thirty-one studies were identified by the second search term. Ten studies met all inclusion criteria. Four studies out of five measuring obesity reported a statistically significant decrease in BMI. Four studies out of nine measuring FVI reported statistically significant improvements in FVI. Four studies found no impact on FVI and one study reported FVI increases only amongst participants who reported the lowest FVI at baseline. Only one out of four studies measuring both BMI and FVI found improvements in both categories.

CONCLUSION: Gardening-based nutrition education programs for children have the potential to impact obesity and FVI. Since recall by either the child or parent/guardian was used to measure FVI in the studies, there may be bias affecting the FVI results. Future research should include the sustainability of BMI reduction amongst participants in these interventions. Findings suggest multi-component interventions, ones that include family, community, and/or school participation, may be the most effective at improving outcomes.

Low-cost Organoleptic Testing of Botanicals for Small Herbal Businesses: Design and Rationale

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BACKGROUND: The Food & Drug Administration (FDA), through its Good Manufacturing Practices (cGMP) regulations, requires all herbal supplement manufacturers, regardless of size, to positively identify each herb used in manufacturing of products, and detect the presence/absence of adulteration. This includes testing of material from wholesale suppliers, even in the presence of the wholesaler's Certificate of Analysis (COA). Larger herbal supplement manufacturers generally rely on sophisticated methods, such as liquid/gas chromatography, UV/Vis Spectrophotometer, DNA testing, or third-party analysis. These tests can be costly and burdensome, especially for small-scale herbal producers. An alternate method, used by herbal, wine, olive oil and other food-based industries, requires basic organoleptic training and detection. The method also eases the financial burden on small herbal businesses.

RESEARCH OBJECTIVE(S): This study aims to design a method, which can serve as a template, for positively identifying plant material, and adulteration of plant material, using organoleptic testing methods.

METHODS: This study will develop an organoleptic testing method to determine how best to train panelists in identifying and differentiating *Lavandula angustifolia* from *Lavandula x intermedia*. *L. intermedia* is a common adulterant of *L. angustifolia*. The first two rounds provide threshold testing, identification of outlier analysts, and training in lexicon agreement before the actual validation measurements in round three. Based on preliminary data generated from pilot experiments that are part of the development of this organoleptic method, three to five sensory panelists will receive three blinded, validated samples of dried plant material used in commerce – two unique samples of *L. angustifolia* and one sample of *L. intermedia*. For a second analysis, panelists will calibrate their noses to known constituents (e.g. camphor, eucalyptol, linalool, linalyl acetate) of lavender essential oil and the expected ratio of those constituents, to differentiate the dominant essential oil ratios in *L. angustifolia* from potential adulterant or poor-quality samples (e.g. *L. intermedia* and aged *L. angustifolia*). In the final round (Panel 3), panelists will be given five samples of dried plant material (three unique samples of *L. angustifolia* and two identical samples of *L. intermedia*) and asked to identify *L. angustifolia* from the adulterant. Three randomized replicates will be tested each round.

DISCUSSION: The development of an in-house, organoleptic testing method requiring minimal training and low-cost laboratory equipment would benefit small herbal businesses efforts to comply with FDA cGMPs regulations. This experiment would help in developing a validated method for use by industry.

Randomized Double-Blinded Trial Exploring the Impact of *Mahonia aquifolium* on Gastric Function: A Research Design

Missenda M.

BACKGROUND: Functional dyspepsia is characterized by feelings of fullness, early satiety, bloating and nausea. These symptoms are known to be affected by gastric accommodation, pace-maker activity and autonomic function. Unlike the pharmaceutical approach to this condition which overwhelms, suppresses and over-rides the physiological response, the herbalist approach to these symptoms is to tonify the stomach tissue improving ongoing function influenced by both the energetic qualities of the herb and the patient. Research on herbs for gastric motility (GM) have focused on energetically warming formulas including *Zingiber officinale* (ginger), and *Carum carvi* (caraway). Historically cooling bitter herbs were also used for hypomotility of the upper Gastro-intestinal tract. What is not known is how the energetic constitution of the patient affects the physiological function and effectiveness of the herb.

RESEARCH OBJECTIVE(S): This study's primary outcome will be to demonstrate the physiological targets of *Mahonia aquifolium* (Oregon Grape) extract on GM. A secondary analysis will include demonstrating a difference in physiological effects of *M. aquifolium* based on individual energetic constitutions using the Humoral Theory assessment by Christopher Hedley.

METHODS: The study design is a randomized pilot trial to assess the impact of a single therapeutic dose of *M. aquifolium* on gastric function. Simple randomization will be used with a sample size of 50 participants split equally between a treatment arm and a control, which will receive no herb. Healthy volunteers between the ages of 18-60 without contraindications to the herb; no congenital or surgical alteration to the gastrointestinal tract (mouth to anus), and no recent use of the study herb or therapeutic doses of its active constituents in the past 6 months will be included. Gastric function will be measured by three noninvasive tests assessing gastric accommodation, stomach pace-making activity using cutaneous electrogastrogram and an ECG test for autonomic function assessment. A blinded energetic assessment will be conducted by a Registered Western Herbalist.

DISCUSSION: This study is designed to assess how an energetic bitter affects various physiological functions influencing GM in healthy participants with variable energetic profiles. We hypothesize that *M. aquifolium* will affect different GM pathways and show an enhanced effect in those participants with a hot constitution (Choleric or Sanguine) versus those with a cold constitution (Phlegmatic or Melancholic). This suggests the importance of using thoughtful formulations which address targeted physiological functions in alignment with patient characteristics so as not to overwhelm or suppress the adaptive pathways.

Using Traditional Assessments of Potency to Critically Evaluate Herbal Ethanolic Extractions: A Research Design

Missenda M, Miller B, Rosenthalis A.

BACKGROUND: This study is part of our ongoing research identifying optimal extraction of plant constituents using traditional methods. For traditional herbalists, potency of herbal qualities is often determined by the strength/presence of the taste associated with a given medicinal action. For example, alkaloids found in goldenseal (*Hydrastis canadensis*) are bitter in taste and deemed responsible for the herb's primary medicinal activity (Fenner, 1888). An extract of goldenseal that is extremely bitter in taste indicates higher potency than an extract more mild in taste. While organoleptic assessment techniques, involving taste and other sensory analysis, is an accepted method of identifying plant matter, rigorous parameters to determine actual potency of extracts through these techniques do not currently exist.

RESEARCH OBJECTIVE(S): This research will provide an essential component for Phase 1 of our ongoing research study by systematically defining optimal protocols and validating the accuracy, robustness, and repeatability of our procedure designed to organoleptically determine potency of *Hydrastis*. A second objective includes assessing how this protocol can be used to assess fitness-for-purpose for ongoing research.

METHODS: *Population:* Ten participants with organoleptic training through Maryland University of Integrative Health will be recruited. *Sample Preparation:* Twelve samples from Phase 1 of our study will be used to assess potency from varying maceration durations of *H. canadensis*. Controls will include low concentration (0.1mg/ml) and high concentration (1 mg/ml) solutions. *Randomization:* Sampling will be blinded and use simple randomization. *Organoleptic assessment:* Prior to sampling, tasters will assess threshold taste using serial dilutions of quinine HCL. The study will use an herbal lexicon with 4 point Likert scale ratings for visual, aroma, taste and mouthfeel characteristics of each sample. Adaptation of the World Health Organization's parameters of bitterness value determination will be used to guide development of the procedure for tasting (2011). *Analysis of data:* A chi-square test will be utilized to infer that enough data was obtained to determine whether there is a significant difference between extracted samples from various maceration durations.

DISCUSSION: Numerous resources and protocols exist for assessing the organoleptic of raw materials to authenticate plant identify and contaminants (WHO, 2011; EPC, 2010; Dentali, 2013). There currently does not exist defined processes for utilizing organoleptic methodology to assess potency and validity of data. This study will provide an optimized and validated procedure for our ongoing study and potentially serve the broader herbal and research community.

Feasibility of Data Collection in a Student Yoga Therapy Clinic

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BACKGROUND: Yoga therapy is an emerging profession with standards for accreditation and certification. While yoga research is growing in volume and rigor, most yoga therapists are not exposed to research. University-based student clinics provide an opportunity to gather data that will expose students to research and contribute to research literature.

RESEARCH OBJECTIVE(S): This study aims to determine the feasibility of ongoing research data collection in a university-based student yoga therapy clinic.

METHODS: Measures from the Patient-Reported Outcomes Measurement Information System (PROMIS) for physical/mental health and the Healing Encounters and Attitudes List (HEAL) to assess student-client relationships were collected from clinic clients in this feasibility study. A database in the Research Electronic Data Capture (REDCap) application was established to collect patient-reported outcomes (PROs) and participant demographics. Research staff obtained informed consent and collected baseline data while the student consulted with a supervisor. Client data on subsequent visits was also collected during the student-supervisor consultation. Feasibility was assessed quantitatively by client enrollment and qualitatively through field notes kept by study staff throughout the study period. Field notes documented study challenges, feedback or concerns of stakeholders (participants, students, faculty, research team, IT personnel, clinic staff, or university administration), problems to be solved, and the results of any implemented strategies for their resolution.

RESULTS: Interest and engagement in research among clients in the student yoga therapy clinic is high, with approximately 80% (n=60) enrolling in this feasibility study and no attrition over 6 months. However, due to the nature of the student clinic schedule, return visits do not occur for many participants, making outcomes data (reported elsewhere) less robust. Challenges in incorporating research data collection in the clinic include ensuring that data collection does not interfere with the flow of clinical encounters as well as various technical/logistical challenges, such as internet speed, remote database access, timing of data collection, training of students to the research procedures, and communication with students and supervisors.

CONCLUSION: Interest and participation in research is high for clients utilizing a student yoga therapy clinic. Student cooperation with the research staff is also high, but some challenges exist, unique to a student clinic, that must be considered during planning and data collection. Regular meetings including investigators, clinic supervisors, student representatives, IT personnel and facilities staff are recommended to assure feasibility of ongoing research data collection.

Reporting Quality of Omega-3 Supplementation Research: A Comparative Analysis between Internet Media and Scientific Articles

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BACKGROUND: Omega-3 dietary supplements have maintained their position as the most popular non-vitamin/non-mineral supplements used by U.S. adults since 2007. Supplement users often report obtaining health guidance from online media resources, but there has been some question as to the quality and veracity of the information these platforms provide. Experts on the matter have suggested the issues stems from a mistranslation somewhere between the research lab and media dissemination.

OBJECTIVES: In an attempt to uncover the location of these potential mistranslations between science and media, we conducted a comparative analysis. This analysis focuses on identifying the areas where discordance is created in the process of scientific research translation to online news media.

METHODS: We conducted a systematic Google News search of media reports on omega-3 supplement research published between the years 2009-2012. In total, we reviewed a convenience sample of 40 media reports. Media reports that referenced a piece of corresponding scientific literature (n=17) were compared to the scientific literature for content. EQUATOR reporting guideline domains were used to extract and compare the media report and scientific article content. Mean domain scores and 95% confidence intervals were determined based on whether or not a media report and corresponding scientific article matched each other in their presentation of reporting domain content. Our secondary analyses used Fleisch-Kincaid readability scores and citation, or full text availability of media reports/scientific articles to assess the readability and accessibility of each publication.

RESULTS: Media reports were more likely to provide potential caveats and warnings for consumers, when compared to their corresponding scientific article (domain mean = 0.88, 95%CI[0.72, 1.0]). Scientific articles on the other hand, typically maintained a reporting domain mean that was close to 100% complete (0.85) for most reporting domains. Fifty-three percent of the corresponding scientific articles (n = 9) were not available in full text to the public. All of the scientific articles reported their result using language above a 12th grade reading level.

CONCLUSION: Inherently, scientific articles and media reports have different audiences, structure, and intended goals in transmission. This communication gap translates to a difference in reporting standards for each type of publication. Future research should explore these differences further to examine ways researchers and journalists might collaborate to close this gap.

A Randomized Study of Traditional Yogic Colon Cleansing Practice on Gastroparesis in Diabetic Patients

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BACKGROUND: Diabetic Gastroparesis (DGP) is a disorder commonly caused by diabetes in which the movement of food from the stomach to the small intestine is stopped or slowed by the muscles of the stomach. DGP is a debilitating condition found in nearly 40% of type 1 and 30% of type 2 diabetic patients and has few satisfactory treatments. Common treatments for DGP vary from implanted gastric electrical stimulation, Botox injections via endoscope, feeding tubes, and Metoclopramide (Reglan) which, in addition to side effects of fatigue, sleepiness, and depression, can cause irreversible tardive dyskinesia. A safer, portable, and low-cost intervention may provide better patient outcomes. A traditional yoga practice widely believed to cleanse the stomach and colon may be a suitable intervention for this disorder.

RESEARCH OBJECTIVE(S): The purpose of this study is to test the effectiveness of a yoga practice, Laghu Shankha Prakshalana (LSP), on Gastroparesis in individuals with diabetes.

METHODS: Thirty insulin-dependent diabetic patients with Gastroparesis will be recruited and randomly assigned to one of three control groups: a.) the experimental group receiving LSP but no other treatment, b.) the comparison group receiving the standard pharmacological treatment Reglan, c.) a control group receiving no treatment for two weeks.

LSP is a two-part colon cleansing yoga practice. It begins with 2 to 3 cups of warm water followed by a specific sequence of 5 postures/movements performed 8-10 times each: Talasana (palm tree posture), Tiryak Talasana (swaying palm tree posture), Kati Chakrasana (waist twisting posture), Tiryak Bhujangasana (swaying cobra posture), Udarakarshansana (spinal twisting posture), then 5 minutes Shavasana.

The subjects in the LSP group will undergo this routine once a day for 14 days and complete a diary noting effects of the practice. All groups will record the number of successful bowel movements.

Pre- and post-intervention assessments include: demographic and BMI data, and patient questionnaires to identify bowel disease and side effects of Reglan. ANCOVA/gain-score ANOVA analyses of data to determine statistical differences between groups will be completed.

DISCUSSION: Few studies have been conducted to examine the effectiveness of LSP as a treatment for gastrointestinal disorders such as Gastroparesis. Yoga maybe prove to be a low cost, accessible, portable, and safe intervention for Gastroparesis. Knowledge of how specific yoga practices can ameliorate this condition will be an important contribution to our knowledge of yoga as a safe and effective integrative health approach.

Yoga Therapy as a Complementary Modality for Female Veterans and Veteran Caregivers Dealing with Traumatic Stress: A Case Study

Stokes Eggleston P.

BACKGROUND: Combat-related post-traumatic stress disorder (PTSD) in veterans and service members is linked to secondary traumatic stress in the spouses of veterans and service members. Female veterans who experience this type of PTSD are often overlooked, and if they are dual military/veteran (in the case below, a veteran spouse caregiver), this trauma can be difficult to address.

Insomnia, exhaustion and stress are common reasons people consider yoga. This client sought out yoga to decrease and lessen these issues and to become healthier for her family. Cognitive behavioral therapy (CBT), widely used with veterans suffering from post-traumatic stress disorder (PTSD) was also used by this client.

CASE DESCRIPTION: A 39-year-old female veteran and caregiver to a combat-injured wounded warrior contacted a yoga therapist to receive alternative therapeutic treatment for her primary diagnosis of PTSD. Client also presented with traumatic brain injury (TBI), lumbar/sciatic pain and insomnia as per her initial intake assessment. She is an Operation Enduring Freedom (OEF) veteran who served in Afghanistan; however, she reports considerable stress being a full time caregiver to her husband who is in a wheelchair with a spinal cord injury. This dual military/veteran role is not fully acknowledged by her doctors. She expressed a desire to get into better shape and become more centered and mindful. She received CBT for several weeks but has recently discontinued treatment because “the nightmares are returning” from serving in Afghanistan. She has received therapeutic yoga through Yoga2Sleep for three months on a bi-weekly basis for 60 minutes by an E-RYT 500 with a 100-hour yoga therapy certification. This also included home practices that focused on breathing, meditation and yoga nidra. Through open discussion at the start of sessions, the client reports lower stress and feeling more calm and relaxed.

CONCLUSION: This case study suggests that therapeutic yoga comprised of pranayama, asana, yamas and niyamas, meditation and yoga nidra may help to expand the awareness of complementary treatment strategies and inform further research for the female veteran and veteran caregiver populations by alleviating stress symptoms, thereby increasing quality of life.

Yoga Therapy for Dementia: Research Design and Rationale

Sullivan M, Park JY.

BACKGROUND: Evidence-based, safe, nonpharmacological treatments are needed to help manage the symptoms of dementia which include: deterioration of cognitive function, impairment in activities of daily living, psychological and behavioral disturbances. The benefits of yoga may include reduction of allostatic load, psychological and autonomic regulation, improved attention and cognitive function and improved movement. While many older adults with dementia may be unable to participate in a standing yoga program due to balance impairments and loss of function, chair yoga (CY) designed for those with dementia may offer a safe environment to participate in the practice.

RESEARCH OBJECTIVE(S): 1) Determine the feasibility of conducting CY for the dementia population including recruitment and adherence of community-dwelling older adults with dementia to the intervention 2) To examine the effects of CY on physical ability, behavioral and psychological symptoms of dementia in older adults dementia compared to chair-based exercise (CBE) and participatory music intervention (MI).

METHODS: The study employs a cluster-randomized, longitudinal design; we will randomly assign each research site 1:1:1 to CY (intervention group), CBE (control group), or MI (control group) using a computer-generated randomization strategy. While the unit of randomization is the site, the unit of analysis for this trial will be the individual participant. A sample of 45 participants will be recruited (CY = 15, CYC = 15, MI = 15). CY will be led by a certified yoga therapist and data collection will occur at baseline, 6 weeks and 12 weeks and will be conducted at the Florida Atlantic University Comprehensive Center for Brain Health. CY will include: physical postures for strength, flexibility and balance; meditation and relaxation practices including progressive muscular relaxation, visualization, intentional/ethical practices; and breathing practices for diaphragmatic breath and relaxation. Measurements will include: Balance (FallTrak II Balance System), muscle strength (EvalTech system), range of motion and mobility (GAITRite system), affect such as anxiety and depression (Hospital Anxiety and Depression scale), frequency of nocturnal agitation behavior (Cohen-Mansfield Agitation Inventory-Short), quality of life (quality of life Alzheimer's disease), sleep (Pittsburgh sleep quality index), reduction in daytime sleepiness (Epworth sleepiness scale).

DISCUSSION: This study explores the feasibility and potential benefits of chair yoga in the dementia population compared to two active controls. Measurements of physical function, psychological and behavioral domains will be assessed to determine effects of yoga therapy for this population. This study included novel approaches to the application of meditation and intentional/ethical practices adapted for this population as these practices may pose particular challenge in neurocognitive decline. The findings can be useful in identification of specific needs and adaptations of practices needed for this population.

GAPS Diet Therapy for Autism Recovery – A Proposed Pilot Study

Taylor A.

BACKGROUND: Autism spectrum disorder (ASD) affects 1 in 68 children, according to the CDC (CDC, 2012). The Gut and Psychology Syndrome [GAPS] diet is a Specific Carbohydrate Diet [SCD] which eliminates all grains, most dairy, and most sugars. A survey of 25,000 parents reported that 66% of ASD children improved by eating the GAPS/SCD diet (Adams, 2007). It's theorized "leaky gut" leads to food proteins (such as casein and gluten) damaging the intestinal villi and mucosa, then incompletely digested foods pass into the blood and blood-brain barrier. The GAPS diet aims to heal the "leaky gut". It's theorized targeting autistic toddlers aged 2-3 will achieve the best outcome.

RESEARCH OBJECTIVE(S): Pending IRB acceptance we will investigate GAPS diet therapy in toddlers. Data include:

- Behavior & speech (using Autism Diagnostic Observation Schedule (ADOS) and Autism Treatment Evaluation Checklist (ATEC))
- Stool consistency/frequency (via Bristol Stool Scale charting)
- Intestinal permeability (via zonulin stool testing from Diagnostic Solutions Laboratory)

METHODS: We will recruit 20-30 autistic children via Baltimore City Infants and Toddlers early intervention program. If adequate funding is available we will provide all food for study participants, and random allocate/double blind the study by preparing GAPS food and look-alike Standard American Diet [SAD] food. However if sufficient funding is unavailable, we will run an unblinded pilot/proof-of-concept study in which the parents will be responsible for food purchasing and meal preparation for their children. In this case, we will teach parents how to cook GAPS-compliant food via group classes and providing The BrainFood Cookbook (Taylor, 2014). Either way, a nutritionist will be on-call daily to answer parent questions, and all food/drink consumed will be logged by parents. We will compare ADOS/ATEC/stool/zonulin parameters before/after the intervention. The entire study period for each child will be 8 weeks. The first two weeks will be important for parents to learn stool charting, food logging, and GAPS diet rules. Then we will enter the 6-week GAPS diet study period, which is hypothesized to be enough time for changes in behavior/speech/stools/permeability. This timeframe is based upon Taylor's GAPS diet success with her own Autistic son. Weight and height to be collected weekly to track body mass index (BMI) to ensure excessive weight is not lost.

DISCUSSION: ASD is becoming more prevalent each year, and yet we have no known causes or cures. Theories involving the "leaky gut" have been discussed for over 30 years; however, researchers have not yet moved forward to study dietary interventions.

Treatment of a Patient with Stage 4 Metastatic Cancer, A Case Report

Thompson SH.

BACKGROUND: The incidence of colorectal cancer in individuals under the age of 50 has increased [Siegel, 2009]. The side effects of commonly prescribed treatment regimens including chemotherapy and radiation suggests a role for adjunctive therapies that include complementary therapies. This case demonstrates that a combination of acupuncture and Chinese herbal therapy may provide a safe and effective approach that allows for greater quality of life for the patient.

CASE DESCRIPTION: In this single case report, the patient had been diagnosed with colorectal cancer in 2013 which had been treated with surgery and chemotherapy. This was followed by a diagnosis of liver cancer with a 75% liver resection in 2015. He had been determined to be cancer free for a period of six months based on CEA levels at the time he began acupuncture treatment at the age of 48 years. Shortly after he came to acupuncture treatment he was found to have tumors that were diagnosed as Stage 4 cancer in his liver and right lung. Patient was treated with acupuncture and Chinese herbs. His choice to utilize complementary medicine was, in part, due to quality of life concerns. The patient had been told that Western medicine did not have any viable options to offer him in terms of cure and thus determined that his focus needed to be on quality of life and working with complementary care to encourage his body to heal. He remained symptom free seven months post diagnosis.

CONCLUSION: This case suggests that Traditional Chinese medicine can support the well-being of a patient diagnosed with cancer.

Yoga Therapy to Decrease Stress Incontinence: A Case Report

Tucker D, Sullivan M, Hyland Robertson L.

BACKGROUND: Urinary incontinence is a common condition, with prevalence estimates ranging from 25%-45% in adult women (Dumouline, Hay-Smith, & Hebee-Seguin, 2014). Stress urinary incontinence (SUI) accounts for half of all reported cases and affects physical, psychological, and social well-being. Yoga therapy is proposed to provide a comprehensive methodology to teach both top-down and bottom-up regulatory strategies to address the biopsychosocial needs of women with SUI.

CASE DESCRIPTION: Over the previous 3-5 years, "Alexis," a 45-year-old-woman, experienced SUI that caused her to stop teaching high-impact fitness classes. A comprehensive yoga therapy framework was employed to evaluate musculoskeletal imbalances, energy and stress levels, and mental states that may have contributed to her symptoms.

Both yoga and biomedical perspectives are offered to present an understanding of how a yoga therapy intervention was implemented to address potential underlying contributory causes of SUI. From a yoga perspective, Alexis demonstrated a pitta constitution with strong rajasic tendencies that emerged under stress and drove her to overextend herself. She had difficulty disengaging from goal-directed behavior and reconnecting to personal needs and self-care activities. From a biomedical perspective, multiple educational and professional stressors contributed to fluctuating periods of physical strain/exhaustion and potentially undermined the client's long-term emotional and physical resilience. Intervention included asana (yogic postures) with a focus on interoception to prompt recognition of tension and relaxation and to improve control of the pelvic floor and breathing mechanisms. This work helped to support the client in building awareness of habitually held tension and to work toward purposeful engagement and relaxation for both stability and ease in movement and daily activities. To improve adherence, practices were framed as mini moving meditations and small interoceptive movements that could be done in any environment and integrated into small breaks in the client's day.

After four one-on-one yoga therapy sessions, Alexis reported greater felt sense of her body, increased awareness of pelvic floor relaxation and engagement, decreased SUI episodes, and more frequent self-care through the day with yoga and mindfulness breaks. She also reported more daily resilience and greater energy.

CONCLUSION: This case suggests that a comprehensive yoga therapy intervention including top-down and bottom-up regulatory strategies to increase awareness, relaxation, self-care, and stability may be beneficial to the physical, mental, and social well-being of individuals suffering with SUI.

The Effects of Yogic Practices on the Peak Expiratory Flow Rates of Smokers: Study Design and Rationale

Turcinovic T.

BACKGROUND: PEFr (Peak Expiratory Flow Rate), also known as peak flow, measures the maximum speed of expiration. The Peak Flow Meter measures the speed the airflow through the bronchi and can detect the degree of obstruction in the lungs. According to recent studies, smokers exhibit a lower PEFr than nonsmokers (Medabala, et al, 2013).

RESEARCH OBJECTIVE(S): This study aims to measure the effects of Pranayama (yogic breathing practices) and Asana (yoga postures) on the PEFr of smokers. This study would hope to find these practices would increase the PEFr of the participants even after one session. This study will measure the immediate and short-term effects of Pranayama and asana on the PEFr.

METHODS: This is a randomized comparison study of men and women between the ages of 30 – 60 who have been smoking cigarettes consistently for a minimum of 10 years. Those who have been diagnosed with any type of COPD will be excluded. The study aims to recruit 30 participants to be randomly divided into 2 groups, using an on line randomization generator. Group one will practice pranayama, group two will practice asana. According to previous studies, Uphadhaya, K., et al, 2008, and Shankarappa, V., et al, 2012, Naddhi Suddhi, alternate nostril breathing, was shown to increase the PEFr in healthy nonsmokers and so Naddhi Suddhi will be the foundational practice for the pranayama sessions, though other practices will also be included. There have been various studies showing improvement of pulmonary function that included multiple breathing practices as well as asana (Karthik, et al, 2014). No studies showing specific asana practices by themselves were found. The asana practice will include postures that open and stretch the thoracic area of the body. Each pranayama and asana session will last 20 minutes. PEFr will be measured at the beginning and end of each session using a peak flow meter. Each group will meet once a week for 4 weeks. The subjects will take their peak flow meter home and be asked to continue the practice at home and record PEFr measurements. A teacher will be available to answer any questions.

DISCUSSION: Showing the effects of yogic practices on bronchial airflow in smokers can possibly open the doors to preventing some of the smoking induced bronchial constrictions that normally develop. Most studies tend to exclude smokers, whereas this study will focus on them. Studying the two yogic practices separately may help distinguish the efficacy of each practice.

Effects of Guided Meditation on Perceived Stress and Compassion Among Medical Residents: Study Design and Rationale

Underwood K.

BACKGROUND: Physicians in their medical residency experience high-pressure situations every day. Intense work environments can result in increased stress levels and decreased compassion in medical residents, resulting in physician burnout and decreased quality of patient care.

RESEARCH OBJECTIVE(S): This poster describes a methodology for conducting a controlled research study on the effects of guided mindfulness meditation vs. non-guided mindfulness meditation on compassion and perceived stress among medical residents.

METHODS: Medical residents with an existing meditation practice of 0-3 times per week will take quantitative surveys before and after undergoing a guided meditation program. Residents will determine their perceived stress level, measured by Perceived Stress Scale, and their compassion level, measured by the Professional Quality of Life Scale, before and after the program. The experimental group will undergo a 3-week guided meditation program, which entails listening to a different online 5-minute guided mindfulness meditation 3 times per week at work. The control group will undergo a 3-week non-guided meditation program, which entails listening to an online 5-minute silent recording with a bell to indicate beginning and end 3 times per week at work. At the end of the 3 weeks, the two groups will switch, as the control group becomes the experimental group and vice versa. Another 3-week program will take place at this time. Both groups will receive training on how to access the meditations as well as guidance on how to complete both the guided and non-guided mindfulness meditations. Residents will be asked to screenshot each meditation upon completion and send screenshots in at the end of each 3-week session.

DISCUSSION: The implementation of this study may be helpful in determining the effects of guided mindfulness meditation vs. unguided mindfulness meditation on perceived stress, and compassion among medical residents. Previous research has been conducted on the effects of mindfulness on job satisfaction and compassion in primary care clinicians, although the research on silent meditation for this population is limited. This study may offer a similar approach on a different population of physicians, facilitating specifically guided mindfulness meditation.

A Machine Learning Approach to Predicting Biochemical and Metabolomic Patterns in Adults

Walsh B, Wood T, Kelly C.

BACKGROUND: Integrative health practitioners have access to a rapidly-expanding battery of biomedical tests, which results in four potential issues: 1) increasing complexity for the practitioner when selecting relevant biomarkers to measure, 2) variability in access to certain markers based on insurance coverage and geographical location, 3) a rapid accumulation of cost as more tests are employed, and 4) the potential for practitioners to ignore the information from more well-established data in favor of novel tests. Importantly, extensive biochemical testing may not need to be performed as regularly if the resulting data is understood in the context of patterns seen in more traditional markers. Machine learning (ML) is widely used in medicine, particularly in radiology, due to its unparalleled ability to detect patterns in data.

RESEARCH OBJECTIVE(S): To determine whether ML algorithms can be used to augment clinical decision making by using widely available (and inexpensive) blood test results to predict important physiological and pathological patterns that normally require more extensive testing. This could reduce both the number of tests required by a practitioner when evaluating a patient and the error in interpretation of those tests.

METHODS: Data from 38,000 individuals will be analyzed retrospectively, and used to create predictive ML models. In the first instance, XGBoost, a boosted decision tree-based algorithm, will be trained using 80% of the patient data. The algorithm will be used to detect patterns from commonly-used blood tests (i.e. complete blood count, comprehensive metabolic panel, basic lipid panel, and iron studies) that are correlated with common nutrient deficiencies and endocrine or immunological disturbances (i.e. low vitamin D, B12, folate, and magnesium, low or high cortisol, low testosterone or estrogen, and disordered cytokine and complement protein levels). To balance the classes when a target outcome is rare, the Synthetic Minority Over-sampling Technique (SMOTE) will be used. The remaining 20% of the data set will be used to “test” the algorithm’s ability to detect a given pattern or deficiency, including its sensitivity and specificity. Model feature importance (a ranking system that shows which markers are most predictive of other markers) will be used to analyze the connection between important physiological parameters.

DISCUSSION: By predicting clinically relevant patterns from basic blood test results, ML models built from complex datasets could allow any practitioner to maximize the utility of their own data, assist in objective interpretation, and augment the accuracy and speed of clinical decision-making.

Cross-sectional Analysis of the Relationship Between Fasting Morning Cortisol Levels, Hydration-Electrolyte Balance, and Blood Cell Counts

Walsh B, Nault D.

BACKGROUND: The role of the hypothalamic-pituitary-adrenal axis in mediating a physiological stress response has been well described in the scientific literature. New research continues to examine the associations between both hypo- and hyper-cortisol responses and Alzheimer's disease, cardiovascular disease, diabetes, chronic fatigue syndrome, fibromyalgia, autoimmunity, and depression. Despite these findings, serum cortisol levels are still not routinely run in a clinical practice due to cost.

RESEARCH OBJECTIVE(S): Our primary and secondary objectives are to explore the relationship of decreasing (primary) and increasing (secondary) cortisol levels, respectively, to the pertinent variables of interest outlined in our Methods. Pertinent variables of interest will be determined based on preliminary data.

METHODS: This secondary analysis of cross-sectional data will use blood chemistry values from 2,257 active members of a US-based health club chain, aged 18-80, from August 2015 to September 2017. Participants with recorded morning cortisol lab values will be included in the analyzed sample (n = 1,236). Participants with more than 10% missing data over all variables of interest will also be excluded from the final analysis. Variables of interest include: Serum Albumin, Hematocrit, Urine Specific Gravity, Sodium/Potassium ratio, Neutrophil/Lymphocyte ratio, and absolute white blood cell counts (Eosinophils, Neutrophils, Lymphocytes, and Monocytes). These variables were chosen based on prior literature. Age and gender of participants will also be examined as covariates.

Variables of interest will be stratified by groupings of gender and categorical cortisol level. Significant differences between these groups will use t-tests/ANOVA (parametric) or Mann-Whitney/Kruskal-Wallis (non-parametric) tests. Descriptive means and standard deviations (parametric) or medians and IQR (non-parametric) will be provided for each variable of interest. Linear regression is the planned analysis for both primary and secondary objectives. If warranted by preliminary data, analyses may be stratified by or adjusted for confounding variables. All analyses will be performed in the most recent version of R, an open-source statistical software program.

DISCUSSION: Sodium, potassium, and absolute lymphocyte counts are routinely run in clinical medical practices. The results of this study may prove beneficial for clinical health care providers to better predict which patients may have abnormal cortisol levels, and thus require additional follow-up lab testing to further evaluate underlying pathophysiology in several chronic conditions. The authors are unaware of any previous human research on these specific biomarker associations.

Specific Carbohydrate Diet for Crohn's Disease in a Child with Autism Spectrum Disorder: A Case Report

Youngblood S, Farris MJ, Lenox T, Moore A, Snow J.

BACKGROUND: Pediatric Crohn's disease (CD) is increasing in incidence and prevalence. There is a need for effective low-toxicity treatments that manage the disease while helping to optimize growth and development. This case adds to the documentation of the Specific Carbohydrate Diet (SCD) as an emerging dietary intervention for pediatric CD.

CASE DESCRIPTION: A 9-year-old boy with a complex medical history, including autism spectrum disorder (ASD), restless leg syndrome (RLS), and weight loss, was diagnosed with CD. The SCD was implemented at the parents' initiative and documented with a diet diary. While on the SCD, the patient was monitored by a pediatric gastroenterology team. The child followed the dietary therapy as the only intervention as follows: 5 months of strict SCD compliance, then a liberalized SCD for an additional 12 months, followed by a permanent shift to a Mediterranean dietary pattern. Clinical presentation following implementation of the SCD showed rapid improvement in overall physical appearance and well-being. Clinical markers (C-reactive protein, erythrocyte sedimentation rate, hematocrit, and albumin) normalized within 2 months of starting the intervention and remained in the normal range following liberalization. Magnetic resonance enterography results at the 4-month mark were negative for hyper-vascularity, bowel dilatation, or fluid collection. Within 6-9 months of initial SCD implementation, the parents reported significant improvement of ASD and RLS symptoms. Five years after initial implementation, the child continues to eat a Mediterranean dietary pattern; remains in remission from CD, is symptom free for ASD and RLS, and maintains a healthy weight.

CONCLUSION: This case demonstrates the potential usefulness of the SCD in the treatment of pediatric CD. Strengths of this case report include use of the SCD as monotherapy in a patient who was drug-naïve for CD medications. The lack of confounding treatments, combined with rapid and persistent improvements in clinical and laboratory measures following dietary change, suggest that the SCD had a direct positive impact on this CD case. Long-term resolution of several historically unrelated disorders in this case also coincided with the dietary therapy. The typical limitations of a case report, including the inability to infer a clear cause-effect relationship and a lack of generalizability, prevent drawing a firm conclusion.

- cause-effect

This case report adds to the growing body of literature on the use of the SCD in pediatric CD. A novel feature of this case report is the improvement in ASD and RLS symptoms that paralleled the remission of CD following dietary adjustment.

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- Modification of the gut microbiome by the SCD provides a possible pathway for linking these clinical changes. Further research is needed to clarify the mechanisms of action for the SCD. Larger, prospective controlled studies are warranted to assess the efficacy of the SCD in pediatric CD and to further evaluate its effectiveness in routine care.