THE Original Internist

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1026 *Review of Systems, History and Physical Exam*
Dr. Robert Kessinger

August 8-9, 2020 **Live/Live Stream** **Rolla, MO**
1001 *Foundations of Chiropractic Family Practice*
Dr. Robert Kessinger

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From the Editor's Desk

by: Virginia Kessinger

Modern medicine is awesome! When we need crisis care, there are many options to choose from. Medicines will save your life but they will never make you healthy.

While watching a hockey game on television recently, I saw a player collapse on the sidelines. Teammates gathered around him and obviously were administering CPR. A trainer scurried over and hooked the fallen player up to a defibulator. ***BAM!*** His life was saved! I started thinking about what I just witnessed. As much as I love conservative care and a holistic approach to healthcare, I definitely knew a healthy dose of Vitamin C was not going to save that life.

Sometimes I think physicians get so focused on what they perceive to be the best treatment for their patients that they are blinded to options. It is easy to slide into a routine and start thinking "herd mentality."

I am sure it would certainly be easier for physicians to have a healthcare cookbook but, great doctors are also avid detectives. I am in awe of those who take each patient seriously enough to get to the root cause of their conditions. It is exciting when a patient returns to good health, rather than accepting "you are getting older, so you can expect to start falling apart."

In our clinic we order a lot of blood work. Sometimes a patient will say they haven't had any blood work for years. It makes me wonder how they have been treated for their illnesses? One of our doctors says, "you always have to look under the hood. Otherwise, how can you possibly know what is going on inside?" That makes perfect sense to me. How do you keep score, if a patient is getting better.... or worse?

It seems like a patient on any medications, vitamins, herbs or botanicals would need to be monitored. Isn't it important to know when that patient's health has improved to the point they no longer need outside intervention?

I remember a patient who came into our office in the 1990's. Her blood values came back with dangerously high iron. After questioning, she said she had been prescribed iron back in the 1960's and had just stayed on that dosage. Someone, somewhere dropped the ball on that patient!

Dr. Jack Kessinger used to say that "every new patient that walks through the clinic door is someone's old patient." A true testament to his care of every patient he treated is echoed when someone enters our clinic in Rolla for care and I recognize them as one of his old patients. It always brings a smile to my face.

Over the years I have watched healthcare evolve. There aren't many family doctors who treat the whole body. There are specialists for everything. That is not a bad thing but, I sometimes wonder if there is as much communication as there should be. I don't think patients always tell their physician about the medicines they are taking from another doctor. So many meds have reactions to others. This can be a serious side effect! A lot of herbal remedies that patients purchase off the shelves at box stores, can have dire consequences when taken with certain medications. I think people are under the impression that a pill is harmless if it is not prescription. In our community we have had fatalities from mixing cold medicines with other prescriptions.

I don't have the answer to this situation but I do recognize the problem.

With all the pitfalls, we are still blessed to have access to great healthcare in our country. We have withstood the old medicine man era, epidemics of all kinds, polio, AIDS and a different kind of influenza almost every year. Research has been the key to modern medicine. Now we just need to utilize all the tools available to assess and treat patients in need.

We often have sales people contact our office with all kinds of equipment that will save humanity. One person will say laser therapy will cure everything from hives to Lyme Disease. And..... It is also great for weight loss! The next person comes along with a miracle water that will restore youth and save everyone from cancer. I may be a skeptic but I don't think there is a one pill (or machine) for every ill.

Bottom line..... Medicines will save a life but it will never make you healthy.
Just saying! ◆

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The Legacy Continues

by: A. Jay Kessinger IV, DC, ND, DABCI , DACBN

The creation of this ongoing series of "the Legacy Continues" comes from lessons learned and wisdom gained as a fourth generation chiropractic internist; Drs. Jess H Butler, A J Kessinger, Jack Kessinger, and now me. "It's funny how life just keeps going on, no matter what's happenin'.'' Dr Jack Kessinger (Dad) said, "The best thing about the good old days is 'they're gone'." It appears that we have to keep reinventing the wheel at every turn to visualize the mechanics of our next step as we attempt to not forget the lessons learned from previous progressions.

Assured accuracy as an inevitable misnomer is part of the price we pay for technological advancement. As an example of the cost we pay for progress, the meteorologist has many instruments making miniscule moment-by-moment measurements yet the weather forecast is hardly ever as accurate as we're assured it will be. On the other side of the same coin, scientific advances in the safety of transportation and travel, as-well as energy efficiency, have never been as great as we're now experiencing. This progression comes with a cost, yet there's always room for improvement.

Humanity was blessed innately with the knowledge of the importance of cleanliness, a necessity for variety in our dietary intake and the necessity of individual productive activities. However, busy-ness, greed and unrealistic ideals have historically led people astray. The concept of "the family doctor" was a progression from an arbitrarily disputed code of inspired wisdom and rebellion. This, in turn, led to a diligent search for scientific answers to the questions related to health, morbidity and mortality.

Just as the burning of libraries in Rome resulted in the necessity to rediscover a recipe for cement, humankind took several steps backward before realizing that all successful advancements require retrospective thought and recognition. In our country, the American Medical Association was founded in 1847 as an organization of physicians "to promote the science and art of medicine and the betterment of public health." Even so, more Americans died due to infections during the Civil War (1860-1865) than from initial gun-shot wounds. Hospital infant mortality rates continued to be very high and only plummeted after vigorous hand washing between patients was mandated. Smallpox, polio, typhus and a host of other diseases and epidemics had their roots in the lack of sanitation in potable water and food stores. Something as simple as cleanliness, that we had been taught earlier in ancient text, took much effort and time to prove, beyond any doubt, of its absolute necessity before becoming a universally accepted and lawfully mandated normal.

Professionally provided health care has greatly changed since its infancy. Family doctors were once revered as extensions of integral family members and trusted to provide the necessary information and care from cradle to grave. Modern progression has replaced the concept of "the family doctor" with the internet information super-highway, a nurse practitioner, the general practitioner, and then a prescribed specialist; all of which recurs methodically in a cybernetic chain of events. Within this modern conglomerate concept of health care, humanity has found need to return to the basics, in our effort to not forget the lessons learned from previous progressions.

The foundation of health lies within the importance of cleanliness, the necessity for dietary variety and a social need for individual productive activities. These needs are afforded to multitudes through a chiropractic naturally symbiotic professional health care system of providing and defining individualized programs of physical, nutritional and emotional strengthening, stabilizing and reiterating protocols. It is with humble hands, hearts and minds that chiropractic continues to increase its capabilities to save lives, extend lives and improve the quality of life of the patients we have the privilege of serving.

◆

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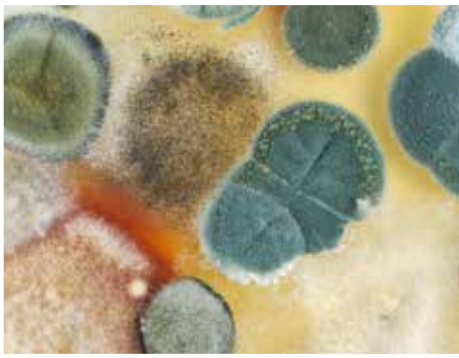

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Hidden Causes and Effects of Dysfunction:

History and Evaluation Procedures that Every Conservative Care Provider Should Consider

by: Christopher Murray, DC, DABCI, DACBN

As I started in practice, I felt overwhelmed at times, often feeling ill prepared to deal with the complex problems with which my patients presented. A decade of practice has taught me a few things. I've learned that more often than not the most expensive and invasive testing is over-utilized and the simplest evaluation tools often yield the best overall results. A good history and exam/evaluation is a must. It will, by far, out perform the newest investigational lab test or procedures in terms of overall efficacy and efficiency, if implemented consistently and correctly.

There is a tendency to start first with the most expensive lab test or tool to evaluate the health status of individuals who seek our help. This leaves the simple to perform exam/evaluation procedures under-appreciated and under-utilized. Many providers fail to use easy to perform, non-invasive tests. Because of this, in my opinion, many serious health problems are inadequately addressed, and/or patients undergo costly procedures that would have been otherwise unnecessary.

It is for this reason that I write this informative article for the conservative provider. It is my hope that the case studies, review of basic and underappreciated exam/evaluation procedures and natural health information is an encouragement and motivation to be bold and step out of comfort zones and pre-conceived professional expectations. I assert that my highest purpose is bringing health and healing to a sick and diseased world.

This paper has far grander goals than to repeat or present information to support the title of this article mentioned above. The true purpose here is to impart a more fully realized understanding by the conservative care provider of this truth: We save lives! There is no disputing this fact. There is no sound argument against it. Throughout this article it is my hope that this understanding is clearly presented in each paragraph, reinforcing the facts and the necessity of conservative care providers in the greater healthcare arena.

The Law of 75

To set the tone for this article and the breadth of the topics it explores. let's first address the preventative aspect of conservative care. The "apple a day keeps the doctor away" adage is overly simplistic, but obviously contains a significant element of truth. Conservative care providers, through the use of their many interventions and treatments most certainly are a portal of entry to the realm of prevention services. During lay lectures I commonly ask men in the audience if they would rather prevent or treat prostate cancer. I have yet to hear one member of the audience answer the latter.

This brings me to the Law of 75 and the fact that every provider should be intimately and intensely interested in aggressively preventing disease and dysfunction. The Law of 75 says basically this: 75% of all life threatening chronic degenerative conditions can be prevented. This isn't a hard-fast number, and in some cases the estimates are far ranging. depending on the organization reporting this and the specific diseases or conditions in question. Let me mention just a few statistics. The American Stroke Association advises that 80% of all strokes are preventable.[1] The CDC advises that about 80% of deaths from coronary artery disease are preventable.[2] More than 80% of all type II diabetes cases are preventable.[3] The National Cancer Institute advises that around 75% of all cancers are related to environmental/dietary factors.[4] Many other studies point to the reality that around 80% of cancers are preventable. Around 90% of all COPD is preventable.[5]

I could go on, and perhaps I should. It honestly seems at times that conservative providers sell themselves short, thinking themselves to be technicians or second thoughts on the health care spectrum. However, the reality is that around 75% of cancer, diabetes, stroke, cardiovascular disease and even pulmonary problems, such as COPD, are preventable. Conservative providers must take their place at the table of health care and truly do just that, *provide real health care*.

Of course, we know that not all conditions are preventable. However, the statistics reported by prominent organizations are overwhelming. Prevention practices and their positive effects on serious disorders and conditions are real! Conservative care providers, and any providers for that matter, must absolutely first be concerned about true prevention for those that whom serve.

Through aggressive prevention strategies (diet, exercise

(Continued on next page)

and lifestyle management) there is no doubt that conservative care providers save lives. *We save lives!*

A Comprehensive History

When I teach continuing education classes it is my recommendation and encouragement to student/doctors that they use the easiest and least invasive means of obtaining the correct assessment. Yes, more extensive testing is often needed, but without the foundation of a good thorough health history one may never arrive at the right conclusion. Multiple studies reveal that a correct diagnosis, protocol and remedy is preceded by a good health history. Up to 90% of the time taking a good and thorough health history will yield the correct assessment.[6,7,8] For this matter, spending time reviewing the chief complaint, onset, aggravating and mitigating factors, are all important, but are really just the beginning.

The reality is, questions regarding lifestyle, diet, work environment, level of stress, exercise, alcohol usage, and smoking patterns, hormone cycling, family history, digestive patterns, foods consumed, sleep patterns (to include snoring, daytime sleepiness, etc), medications and supplements used and many more are imperative to a well conducted consultation and health history.

Reviewing in detail the history elements noted above, and so much more, is especially crucial to the conservative provider who is interested in addressing the "whole health" of any given patient. In addition to question regarding the chief complaint, the "whole health" questions truly get to the "why" of the condition to begin with. If we truly want to have the most impact on chronic degenerative conditions we must be concerned with this line of comprehensive questioning.

Time in a doctor's office is a precious commodity. However, to truly be effective change agents we must take the time to assess all the above factors affecting health, understanding the time commitment involved. From a good comprehensive history other evaluation procedures and tests may be recommended, providing a clear clinical picture and direction for the care of those we serve. A comprehensive history is not only critically important, but is the simplest of any of the services we provide and, quite frankly, is of paramount importance.

Without any additional testing or further evaluation, it is a fact that doctors can address those preventative factors spoken about previously to at least some real extent. Just addressing diet, lifestyle and exercise, can have a profound impact on virtually everyone's health.

I remind all conservative care providers that the most important thing is that we do all we can to helpfully intervene in a patient's life. We have so much to offer those who seek our help, with or without additional testing modalities. A comprehensive history is perhaps the most important step in our being able to step into an individual's life, bridge the gap, and make recommendations and administer remedies that will impact and save lives. The importance of the comprehensive history must not be underestimated.

Start With the Easiest Procedures

It may seem simplistic to use the acronym KISS *("keep it simple stupid"),* but in reality, most of the time the simplest procedures are the ones that will get used the most often by the largest number of doctors. There are exceptions, but most of the time these are also ones that are often the most documented and validated. Unfortunately, it is sometimes the simplest of evaluation procedures that are overlooked. They are sometimes, relegated to antiques, underappreciated and underutilized. I will next briefly describe several exam/evaluation procedures from arguably the easiest to the most complex circumstances. It is my opinion the procedures listed below are well accepted and easy to perform. Understanding lab testing and the importance of evaluating such information is paramount.

Visual Inspection

What we see with our eyes upon visual inspection is arguably the best first way to assess a patient's condition, aside from obtaining a good history. Often times providers routinely dismiss a thorough exam, which of course involves a visual inspection. Below are certain presentations that, in my opinion, are often overlooked or at least underappreciated assessments of a patient's overall condition or status. Obviously the following list of presentations is not exhaustive. The select few represented here should be reminders to all of us that we must be willing to take the time to look at the outward expressions of health, through their visual presentation. It is just so important for all providers to be reminded of important visual cues of health status so an accurate clinical picture is obtained, and ultimately a proper health plan can be created.

It should also be said that a presentation noted on visual inspection may or may not absolutely reflect some health status change. These visual cues are just indicators of possible, and in some cases probable, health status changes. Presentations noted on visual inspection should be correlated to health history. It is the combined influence of a proper patient intake, with a thor-

(Continued on next page)

ough and comprehensive health history and visual inspection, that more detailed examination procedures may be deemed necessary to find the cause of a patient's underlying dysfunction.

Acanthosis Nigricans

The darkened skin surrounding transitional areas of the body is almost jokingly thought by some patients to be a dirty or soiled area of the skin that is difficult to get clean. There are many hormonal changes that can explain these visual observations. Specifically, blood sugar deregulation is commonly present with this presentation.[9]

Tenia Pedis

Many factors contribute to experiencing toe nail fungus. However, it is good to note research also links this common unsightly presentation to cardiovascular disease and a weakened immune system.[10]

Alopecia Hair loss

Many can quickly identify the significance of hair loss in certain areas of the body. A loss of the lateral one third of the eyebrow has been noted to accompany many cases of hypothyroidism. A loss of hair in the lower extremities is often related to reduced vascularization and circulation related to peripheral vascular disease.

Pursed Lipped Breathing

By the time this presentation and other signs of dyspnea present, respiratory dysfunction has usually been present for some time. Eighty percent of all cases of dyspnea or difficulty breathing can be found with those with a history of a pulmonary disorder. Chances are if you have patients with dyspnea, they may have some serious levels of respiratory dysfunction that most certainly could be affecting their ability to heal, regulate their blood sugar and/or generally prevent them from living with optimal health.

Skin Color

Cyanosis and ashen gray or bluing in the face, hands, feet and around the lips may certainly be related to hypoxic and low circulation conditions.

Skin Tags

Similar in some ways to anthrosis nigricans, these can be multi-factorial in cause but many studies suggest their presence is being related to changes in hormone status and diabetes.

Peripheral Edema

Unilateral edema in the ankle could be of a systemic/visceral etiology but in general it is most likely of a proximal origin. Whereas, bilateral pitting edema is more likely related to cardiac congestion, liver and/or renal impairment. Either way, edema is abnormal and should be evaluated routinely.

Basic Exam Procedures Proven to be Simple and Effective

Height and Weight- Simple and often underappreciated, but should be a standard part of any basic exam. Acute loss of weight in the absence of dietary and lifestyle changes may certainly be related to cancer and/or some other wasting disorder. The reality is, changes in height and weight give great insight into the metabolic status and/or general health status of an individual. Just noting changes in weight may be related to thyroid and hormone dysfunction, pregnancy status and even psychological health.

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Pulse- Evaluation of an individual's pulse is extremely important. Not only is the presence of a pulse rate imperative, but it's rhythm and comparing it to previous recorded pulse rates can be quite revealing. Changes of pulse, even though within normal ranges, may certainly be related to endocrine and/or cardiac dysfunction. Pulse elevation is also noted with hypoxic conditions as well. A good assessment of pulse, and monitoring it, can also be a guage in evaluation of certain allergies and sensitivities. Taking an individual's pulse is so basic, and yet can truly indicate some very important things.

Blood Pressure- One of etiologies of cardiovascular disease, including cerebravascular disease and stroke, is hypertension. While there is a general tendency for blood pressure to increase as we age, there is controversy about the ever-increasing emphasis on lowering one's blood pressure to below 120/80. There is overwhelming evidence that blood pressure too high is just that, dangerously too high. Changing of one's blood sugar status and lifestyle/exercise most certain can have a dramatic impact on blood pressure. Hormone status, infection, sleep disturbance and countless other disorders can produce notable changes in pulse and blood pressure. Pre and post blood pressure testing is easy, well accepted by the greater healthcare community, expected by patients and is a fundamental component of evaluating patients.

Pulse Oximeter- We all have heard the saying, "You can live without eating for weeks, without drinking for days and only a few minutes without breathing." Oxygen exchange is one of the most vital things our body does daily. So, assessing for oxygen status level, which is very simple and non-invasive, has to be at the top of a conservative care provider's tool box. Checking oxygen saturation levels is still an important screening for a multitude of very important conditions. Hypoxia (low oxygen status) can be an indication of respiratory dysfunction like COPD and even sleep apnea. However, lower levels may also be related to smoking and other more serious cardiopulmonary disorders. If one's oxygen levels are low, they most certainly will be less likely to heal, repair and self-regulate from any number of serious and benign conditions.

More Advanced Evaluation Procedures to be Considered

Urinalysis- In order of progression of ease and non-invasiveness, a simple dipstick UA is perhaps one of the first laboratory procedures, and most commonly performed by portal of entry providers worldwide. So much information can be gleaned from a urinalysis. Signs of blood sugar dysregulation, infection, kidney dysfunction and a multitude of organic disorders can be in part screened by use of this procedure, all without even breaking the skin. While the presence of proteinuria, hematuria and/or glycosuria do not prove that severe organic dysfunction is present, they do signify probable dysfunction and necessitate further inquiry.

Let me pause for a moment and highlight the previously mentioned Law of 75%. From a conservative provider standpoint, we know that diet and exercise are paramount to optimal health. One of the largest dietary shortfalls and risks to our modern Standard American Diet (SAD diet) is the presence of high amounts of refined sugar and lifestyles that promote blood sugar dysregulation. In 1970, the average consumption of sugar was 123 pounds of sugar per person, per year. Today, the average American consumes almost 152 pounds of sugar in one year.[11] It is for this reason that I encourage doctors with whom I teach that we must all become experts in detection and correction of blood sugar disorders. Yes, there are many other areas of system/organ dysfunction that may contribute toward a myriad of disorders. However, we can greatly improve a patient's health status by giving special attention to their blood sugar status. Improving a patient's blood sugar status can be truly effective in reducing the risk of many conditions from diabetes to Alzheimer's Disease. Most natural health providers make dietary recommendations, so why not assess for this condition initially, during, and after treatment. Why not objectively measure the results of our treatments? For these reasons, a dipstick UA can be a powerful tool in the assessment of virtually any patient who walks through our doors.

Finger Stick Glucose and A1C

Since blood sugar status is so important to providers across the spectrum, some simple follow-up blood sugar tests make logical sense. Many conservative providers, some who do not have access to a full-service laboratory, are intimidated by the prospect of phlebotomy and lab work in their clinics. For this reason, finger stick testing is a viable option.

Full Blood Panels

Obviously, after a urinalysis, blood chemistries via venous phlebotomy offer a huge advantage to providers. First, they can offer insightful information that helps providers to rule out serious conditions and send them elsewhere for crisis care. Quite frankly, not every patient who presents in our offices should be in our offices. Serious conditions that need crisis intervention may be elusive without proper examination and testing

(Continued on page 16)

Christopher Murray, DC, DABCI

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Quotes from a few of our attendees:

"The materials were complete and very educational. Dr. Chris was very thorough in his coverage of the material." L. Lawson

"This class will definitely make me a better doctor even if I never do a single DOT exam." C. Janushchka

" Dr. Murray is easy to understand, knows his stuff, and easy to talk to. I thought the course was great!" S. Black

" His knowledge of the subject matter, his organization and delivery was outstanding. When you pay, you'd like to get what you paid for. I definitely did. I got it!" R. Shepherd

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procedures. Blood chemistries can help rule in or out cardiac, liver, kidney, electrolyte, infection, endocrine dysfunction and other disorders. Ordering full blood panels also offers great insight into the nutrition, blood sugar and inflammatory status of an individual. Blood analysis also helps to validate an individual's doctor's treatment approach. After changing diet, addressing environment exposures and addressing core deficiencies, what metrics are being employed to evaluate successful treatment? Blood testing provides well respected, hard copy proof of successful treatment. For these and other reasons, full blood panels should always be a consideration.

Whether a provider is ordering and interpreting labs themselves, or if they are referring the patient for those services elsewhere, undoubtedly the acceptability by the greater health community and the bulk of significant information that can be derived from a complete blood panel certainly makes full blood panels an option that all conservative providers must consider.

Case Study 1

30-year-old female presenting with general achy pain in multiple joints. She reported with hypertension, chronic fatigue, inability to lose weight and diabetes being managed with Metformin. The patient was exercising on a sporadic basis, and admittedly was intermittently eating a diet high in refined carbohydrates. First lab results revealed significant blood sugar and triglyceride elevations, elevated inflammatory markers and thyroid involvement. The milky visual appearance of the blood serum was noted prior to her individualized health plan (image 5). Approximately 4 months later normalization of most previous lab findings (image 6) was achieved even though the patient was no longer taking any medications at that time. The obvious

Legend: Warning | High Risk | Critical | ★ Optimal | Improvement | Worse | Ø No Improvement

Test Description	Current Rating 05/22/2019		Prior 01/25/2019	Delta	Healthy	Clinical	Units
Glucose	107.00	High	346.00		80.00 - 95.00	65.00 - 99.00	mg/dL
Hemoglobin A1C (Gly-High)	6.00	high	10.40		4.80 - 5.61	4.50 - 6.41	%
Uric Acid	3.20	Low	4.30		4.50 - 7.50	3.70 - 8.60	mg/dL
BUN (Blood Urea Nitrogen)	12.00	*	10.00		8.00 - 16.00	6.00 - 20.00	mg/dL
Creatinine	0.63	Low	0.59		0.93 - 1.10	0.76 - 1.27	mg/dL
GFR Est.	118.00	*	121.00		59.00 - 145.00	45.00 - 150.00	/min/1.73
BUN / Creatinine Ratio	19.00	High	17.00		12.00 - 17.00	8.00 - 19.00	ratio
Sodium	141.00	*	134.00		139.00 - 143.00	134.00 - 144.00	mmol/L
Potassium	4.40	*	4.20		3.80 - 4.50	3.50 - 5.20	mmol/L
Chloride	107.00	High	99.00		102.00 - 105.00	97.00 - 106.00	mmol/L
Magnesium	1.90	*	1.60		1.90 - 2.20	1.60 - 2.30	mg/dL
Calcium	9.40	low	9.30		9.61 - 10.00	8.70 - 10.20	mg/dL
Calcium/Albumin Ratio	2.14	*	2.11		2.10 - 2.50	2.03 - 2.71	ratio
Phosphorus	4.30	high	3.70		3.40 - 4.00	2.50 - 4.50	mg/dL
Total Protein	7.20	*	7.50		7.10 - 7.61	6.00 - 8.50	g/dL
Albumin	4.40	*	4.40		4.10 - 4.50	3.50 - 5.50	g/dL
Globulin	2.80	*	3.10		2.80 - 3.51	1.50 - 4.50	g/dL
A/G Ratio	1.60	*	1.40		1.20 - 1.60	1.10 - 2.50	ratio
Total Bilirubin	0.50	*	0.50		0.30 - 0.90	0.00 - 1.20	mg/dL
Alk. Phosphatase	67.00	*	85.00		64.74 - 91.26	39.00 - 117.00	IU/L
Creatine Kinase	105.00	*	117.00		32.00 - 137.00	24.00 - 204.00	U/L
LDH	137.00	low	152.00		155.00 - 190.00	121.00 - 224.00	IU/L
SGOT (AST)	10.00	*	22.00		10.00 - 26.00	0.00 - 40.00	IU/L
SGPT (ALT)	11.00	*	24.00		8.00 - 20.00	0.00 - 45.00	IU/L
GGT (r-GTP)	10.00	*	33.00		10.00 - 39.00	0.00 - 65.00	IU/L
Serum Iron	58.00	low	101.00		81.00 - 126.00	38.00 - 169.00	ug/dL
Ferritin	108.00	low	163.00		152.00 - 278.00	30.00 - 400.00	ng/mL
Total Cholesterol	170.00	*	212.00		150.00 - 180.00	100.00 - 199.00	mg/dL
Triglyceride	138.00	*	1,217.00		50.00 - 150.00	0.00 - 200.00	mg/dL
HDL Cholesterol	26.00	Low	20.00		50.00 - 150.00	40.00 - 200.00	mg/dL
VLDL Cholesterol	28.00	high			6.00 - 20.00	5.00 - 40.00	mg/dL
LDL Cholesterol	116.00	High			50.00 - 75.00	0.00 - 99.00	mg/dL
Total Cholesterol / HDL Ratio	6.50	High	10.60		0.00 - 4.00	0.00 - 5.00	ratio
Triglyceride/HDL Ratio	5.31	High	60.85		0.00 - 2.00	0.00 - 4.00	ratio
TSH	4.26	high	2.58		0.50 - 3.50	0.45 - 4.50	uIU/mL
T4 Thyroxine	9.00	high	9.90		7.10 - 9.00	4.50 - 12.00	ug/dL
T3 Uptake	34.00	*	33.00		29.00 - 35.00	24.00 - 39.00	%
T7 (Free T4 Index) (FTI)	3.10	*	3.30		2.61 - 3.60	1.20 - 4.90	
T4, Free (Direct) Thyroxine			1.76		1.00 - 1.50	0.82 - 1.77	ng/dL
T3 Free (Triiodothyronine)			3.20		2.60 - 3.80	2.00 - 4.40	pg/mL
Thyroid Peroxidase (TPO) Ab (antibodies			321.00		0.00 - 9.00	0.00 - 34.00	IU/ML
Thyroglobulin AB (Antibody)			323.40		0.00 - 1.01	0.00 - 1.10	IU/ML
Reverse T3			23.70		13.20 - 20.10	9.20 - 24.10	pg/mL
CRP C-Reactive Protein	3.00	high	7.00		0.00 - 1.50	0.00 - 4.90	mg/L
White Blood Count	7.10	*	7.20		5.70 - 8.50	3.40 - 10.80	k/cumm
Red Blood Count	4.49	low	4.92		4.54 - 5.40	4.14 - 5.80	m/cumm
Hemoglobin	13.10	low	14.70		14.55 - 16.15	13.00 - 17.70	g/dL
Hematocrit	40.30	low	43.40		42.00 - 47.50	37.50 - 51.00	%
MCV	90.00	*	88.00		84.00 - 92.00	79.00 - 97.00	fL
MCH	29.20	*	29.90		28.60 - 31.00	26.60 - 33.00	pg
MCHC	32.50	low	33.90		33.20 - 34.50	31.50 - 35.70	g/dL
RDW	12.60	low	12.80		13.30 - 14.40	12.30 - 15.40	%
Platelets	284.00	*	256.00		250.00 - 350.00	150.00 - 450.00	x10E3/uL
Polys/Neutrophils (SEGS-PMNS)	49.00	low	46.00		51.00 - 63.00	40.00 - 74.00	%

changes in serum color, from milky white to mostly transparent amber, were largely due to change in triglyceride levels. Her individualized health plan consisted of diet and lifestyle modification and addressing nutrient and hormone deficiency status. Subsequent to the individualized treatment plan provided, energy improved, and she reported no systemic achy pains, and she had lost substantial weight.

Image #5 and #6

Spirometer

It can not be overstated that our ability to inhale, exhale, and diffuse oxygen is paramount to every aspect of our health. Our ability to breath and exchange oxygen and Co2 can affect diabetes, heart disease, weight loss, musculoskeletal pain, and a multitude of other conditions. Just one area of pulmonary dysfunction, COPD, is expected to be the 3rd highest cause of mortality in the nation within the next couple of years.[12]

Previously in this article, a pulsed oximeter was recommended as a screening device. A more accurate tool designed to assess the volume of air that can be exhaled from the lungs is the spirometer. This particular test is underutilized in most practices. It is hardly more invasive than the use of the finger lead in the case of the oximeter. It simply involves breathing forcefully through a tube. An accurate measurement of ability of the lungs to move air is an easy and effective way to assess the general health status of the lungs and pulmonary function in general. Many conditions, including smoking, obesity, and poor conditioning, can have a marked affect on lung volumes. Many of these deficits in pulmonary function can be improved through diet and lifestyle changes. Conservative non-invasive lung function testing via spirometry should be considered.

Case Study 2

A 48-year-old male patient presented with fatigue, generally felt like he was in a "brain fog", and intermittently out of breath. The patient was a smoker and had a generally poor diet. On physical exam it was found that the patient's O2 levels were reduced slightly to 91%. While walking into the consultation/exam room it was noted that the patient exhaled while "pursing" his lips. Seated at rest, a labored respiratory sound was noted directly after walking from the consultation chair to the exam table. An expiratory wheeze was noted on auscultation, but otherwise was a fairly unremarkable physical evaluation. Laboratory examination revealed elevations of cholesterol and inflammatory markers, such as c-reactive protein. In addition, RBC, hemoglobin and hematocrit were also noted to be elevated.

When found on laboratory testing, some physicians will correlate elevated RBC findings to dehydration. This is an obvious possibility. However, hypoxic conditions as

Carbon Monoxide, Blood	17.1	High	%	0.0 - 3.6	01
			Environmental Exposure:		
			Nonsmokers	<3.7	
			Smokers	<9.9	
			Occupational Exposure:		
			BEI	3.5	
			Detection Limit =	0.2	
Verified by repeat analysis					

(Continued on page 19)

Total Cholesterol	244.00	High			150.00	-	180.00	100.00	-	199.00	mg/dL
Triglyceride	313.00	High			50.00	-	125.00	0.00	-	149.00	mg/dL
HDL Cholesterol	28.00	Low			55.00	-	120.00	39.00	-	140.00	mg/dL
VLDL Cholesterol	63.00	High			6.00	-	20.00	5.00	-	40.00	mg/dL
LDL Cholesterol	153.00	High			50.00	-	75.00	6.00	-	99.00	mg/dL
Total Cholesterol / HDL Ratio	8.70	High			0.00	-	4.00	0.00	-	5.00	ratio
Triglyceride/HDL Ratio	11.18	Very High			0.00	-	2.00	0.00	-	4.00	ratio
TSH	1.00	*			0.50	-	3.50	0.45	-	4.50	ulU/mL
T4 Thyroxine	7.80	*			7.10	-	9.00	4.50	-	12.00	ug/dL
T3 Uptake	31.00	*			29.00	-	35.00	24.00	-	39.00	%
T7 (Free T4 Index) (FTI)	2.40	low			2.61	-	3.60	1.20	-	4.90	
CRP C-Reactive Protein	5.50	High			0.00	-	1.50	0.00	-	4.90	mg/L
White Blood Count	9.20	high			5.70	-	8.50	3.40	-	10.80	k/cumm
Red Blood Count	5.85	High			4.54	-	5.40	4.14	-	5.80	m/cumm
Hemoglobin	18.30	High			14.55	-	16.15	13.00	-	17.70	g/dL
Hematocrit	54.50	High			42.00	-	47.50	37.50	-	51.00	%
MCV	93.00	high			84.00	-	92.00	79.00	-	97.00	fL
MCH	31.30	high			28.60	-	31.00	26.60	-	33.00	pg
MCHC	33.60	*			33.20	-	34.50	31.50	-	35.70	g/dL
RDW	12.70	low			13.30	-	14.40	12.30	-	15.40	%

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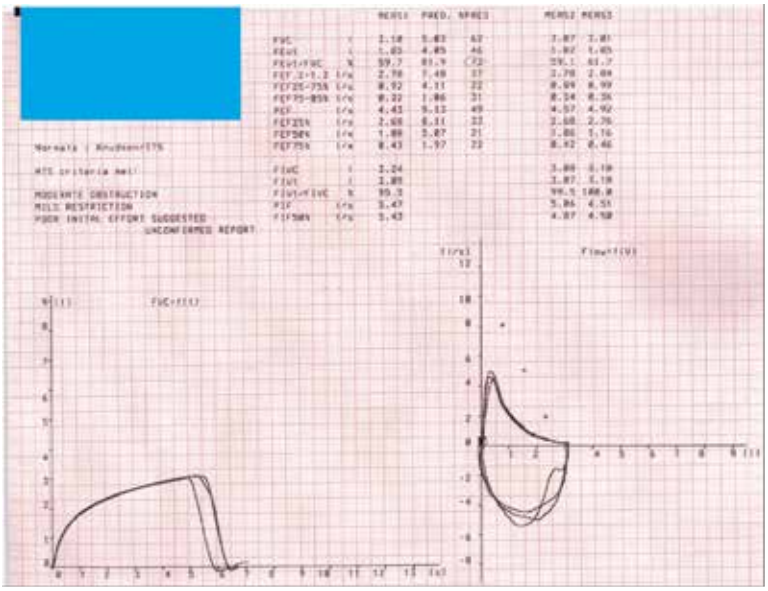

may occur in smoking, COPD and sleep apnea. These can cause increased proliferation of RBC factors that help to carry oxygen more efficiently in compromised states. Therefore, an increase in these values should always be correlated with a patient's overall clinical picture.

Because of the history of smoking, apparent pulmonary findings on evaluation and noted RBC/differential findings, an additional blood laboratory test for carbon monoxide was ordered, as well as a spirometer test. Carbon monoxide elevations were noted (as our office finds in any patient who smokes more than one half pack a day), and an obvious reduction in lung function was found as well. The patient was placed on dietary changes and lifestyle modifications to include smoking cessation. He commented that he knew he needed to quit smoking and other providers had made similar recommendations in the past. However, after seeing the testing performed in our office and having it explained in detail, he now felt motivated to quit smoking.

Conclusion

History and examination procedures can be very extensive and time consuming. All relevant testing procedures are too numerous to list here, and this article is not intended to be exhaustive by any means. My purpose is to create a framework from least complicated to most complicated procedures that most conservative providers have within their scope of practice.

The case studies presented highlight many of the examination procedures and diagnostic tests discussed. It should be noted the primary intervention in each one of these case studies was related to diet and lifestyle prescriptions. The majority of the prescriptive changes present in each case study could have been suggested without any laboratory testing. Smoking cessation, basic diet and exercise recommendations are the staple of most conservative providers' treatment regimen. We know (going back to the Law of 75%) that the preventative services we provide saves lives. However, additional laboratory and diagnostic testing does increase the accuracy of our findings and tailors our treatment plans to account for hidden areas of dysfunction that could not have been identified in any other way. Additional laboratory and diagnostic testing also provide an often-necessary element of protection to our patients, and helps us validate the results of our treatment.

Our sick society needs aggressive prevention services now more than ever. Conservative provider treatment approaches are being validated daily. Our life saving and health optimizing treatment protocols are safe, non-invasive and support the body by encouraging it to heal, repair and self-regulate. As conservative providers we must continue focusing on foundational history and examination procedures. This historically has and will continue to assist the studious clinician in finding the elusive causes and effects of bodily system dysfunction.

About the author

Dr. Christopher Murray is a chiropractic physician, graduating in 2007 from Cleveland of Chiropractic, KC, valedictorian of his class. He is certified by the American Naturopathic Medical Certification Board as a naturopathic physician. He is a diplomate of the American Board of Chiropractic Internists and is a certified medical examiner with the Department of Transportation/Federal Motor Carrier's Safety Administration. His practice emphasizes full-scope, conservative primary care physician services. Dr. Murray teaches continuing education classes in diagnosis, laboratory analysis, nutrition, and DOT/FMCSA medical examiner certification.

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(Continued on page 38)

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Thoughts at Large:

Controversies in Clinical Nutrition and Functional Medicine

Issue #15

PROBIOTIC SUPPLEMENTS – *THE REALITY OF PREVENTIVE SUPPLEMENTATION*

by: Jeffrey Moss, DDS, CNS, DACBN

Introduction

For many years now probiotic supplements have been best sellers in both the professional and retail marketplaces. While many purchasers employ these products as part of an interventive program to address a clinical concern, which is, more often than not, related to GI dysfunction, there is no question that many if not most purchasers use these products as a preventive measure to avoid future dysfunction. While there is also no question that a massive volume of information in print and on the Internet advocates preventive use of probiotic supplements, does published research support this common practice? Of course, one easy answer to this question relates to the use of probiotic supplements to reduce or prevent GI-related side effects from oral antibiotics, which is well supported by several studies. However, beyond that, is there any real benefit for basically healthy individuals who have no acute health concerns to ingest probiotic supplements for sometimes months and years, as is often the case?

As you will see, the recently published paper "A review of probiotic supplementation in healthy adults: helpful or hype?" by Khalesi et al (Khalesi S et al. *Eur J Clin Nutr*, Vol. 73, pp. 24-37, 2019) suggests that the answer is yes, at least some of the time. Interestingly though, as will be highlighted, the benefits generally do not occur for the reason most people believe. More on that later.

A Review of the Paper "A Review of Probiotic Supplementation in Healthy Adults: Helpful , or Hype?"

The first quote I would like to feature from this paper points out that, even though much published research exists on the benefits of probiotic supplementation with ailing populations, very little exists on the use of probiotic supplements with healthy individuals:

"While research has demonstrated positive effects of probiotic consumption on several health outcomes, the majority of the published literature is in populations with underlying pathologies. Evidence supporting the health-promoting effects of probiotics in healthy adults is limited and less consistent."

To ascertain this aspect of probiotic use, Khalesi et al conducted a review of the literature using the following protocol:

"Studies were included if they (1) were experimental trials, (2) included adults, aged 18 years and older, (3) used live bacteria (probiotics), (4) included healthy adults and (5) had accessible full-text publications in English. Healthy adults were defined as individuals with no reported status of chronic or acute diseases, including cardiovascular disease (CVD), obesity (body mass index (BMI) ≥ 30 kg/m^2), liver disease, cancer, psychological disorder, etc. Adults who reported having symptoms consistent with the common cold, who were overweight (BMI 25-29.9 kg/m^2) or smokers, were not included. Studies were excluded if probiotic treatment was mixed with other ingredients, or if pregnant women or both healthy and unhealthy adults were included as participants in one group."

Relevant studies published between 1990 and August 2017 were considered. In all, 45 studies were included in the Khalesi et al review.

The Impact of Probiotic Supplements on Gut Microflora Populations

In terms of the impact of probiotic supplements in healthy populations, it is my guess that the authors began here as this is, as you will see, where the biggest misconceptions reside in terms of why most people ingest probiotic supplements preventively. As you are undoubtedly aware, it is the opinion of many, if not most, in both the healthcare community and the population at large that quality probiotic supplements will make permanent, beneficial changes to resident microflora. In partial agreement, Khalesi et al state:

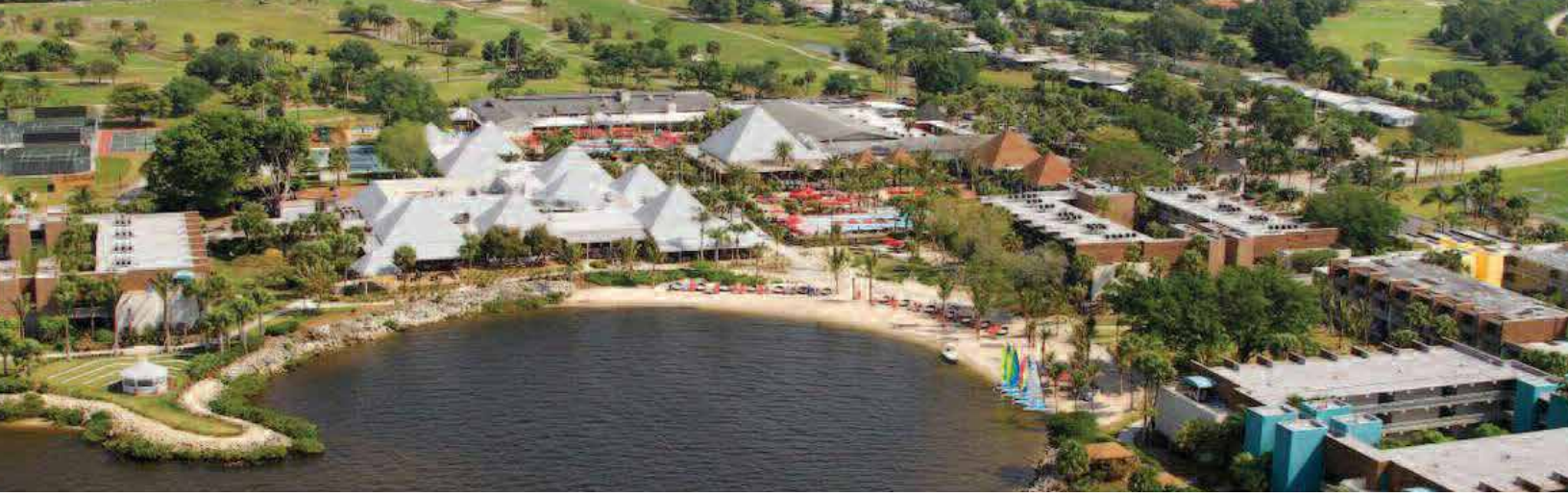
"Changes in the concentration and composition of intestinal microorganisms would suggest that probiotics are effective, at least in terms of colonization."

However, contrary to the belief of many, as I mentioned, the authors also reported the following:

"*It also appears that changes in the gut microbiota of healthy adults following probiotic supplementation are temporary and return to pre-treatment levels within 1-3 weeks once supplementation has ceased."*

Next, the authors discuss another popular misconception about the need for probiotic supplements to establish gut colonization to be effective. This is

(Continued on page 24)



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Thursday, April 30, 2020: (3.5 hrs.)

10:00am - 12:00pm . . . . . Risk Management[1]
. . . . . Doctor Patient Communication[2]
12:00pm - 1:00pm . . . . . Registration
1:00pm - 3:00pm . . . . . Ethics[3]
3:00pm - 3:30pm . . . . . Break
3:30pm - 5:30pm. . . . . Dr. Wayne Sodano
5:30pm - 6:30pm. . Practice Building Breakout #1*
7:00pm - 8:00pm . . . Welcome Cocktail Reception

Friday, May 1, 2020: (5 hrs.)

7:30am - 8:00am . . . . . Registration
8:00am - 8:30am . . . . ACBN Membership Meeting
8:30am - 10:00am . . . . . Dr. Kelly Halderman
10:00am - 10:30am . . . . . Break
10:30am - 12:00pm . . . . . Dr. Stacey Bell
12:00pm - 1:30pm . . . Lunch sponsored by Moss Nutrition
1:30pm - 2:30pm . . . . . Dr. Chris Bump
2:30pm - 3:00pm. . . . . Break
3:00pm - 4:00pm. . . . . Dr. Chris Bump
4:00pm - 4:30pm. . . . . CON Membership Meeting
4:30pm 6:00pm . . . . CBCN Membership Meeting
4:30pm – 5:30pm. . Practice Building Breakout #2*

Saturday, May 2, 2020: (5 hrs.)

8:00am - 10:00am . . . . . Dr. Brett Wisniewski
10:00am - 10:30am . . . . . Break
10:30am - 12:00pm . . . . . Dr. Cindy Howard
12:00pm - 1:30pm . Lunch spons. by Bio-Botanical Research
1:30pm - 2:00pm. . . . . CON Board Elections
2:00pm - 3:30pm. . . . . Dr. Susan St. Claire
3:30pm - 4:00pm . . . . . Break
4:00pm - 5:30pm. . . . . Dr. Robert Kessinger
5:30pm – 6:30pm. . Practice Building Breakout #3*

Sunday, May 3, 2020: (3.5 hrs.)

8:00am - 10:00am. . . . . Dr. Robert Boyd
10:00am - 10:30am . . . . . Break
10:30am - 12:30pm . . . . . Dr. Jeff Moss
12:30pm - 1:00pm. . . . . Closing Remarks

[1] This session will count for TX docs and everyone but NY docs. [2] This session will count for NY docs and everyone but TX docs. [3] Two sessions running concurrently: one for NY docs and one for TX docs. Everyone else can choose which sessions to attend for credit. *1 hour by sign-up only.

also not true:
"…colonization may not necessarily be required for changes in the gut microbiota. The passage of probiotic bacteria (e.g., bifidobacterial) itself through the gut may be sufficient to reduce colonies of pathogenic bacteria by reducing their adhesion and competitive nature."

Interestingly, what can make somewhat permanent changes to resident gut microflora is what is often included in probiotic supplements, prebiotics:
"Evidence suggests that prebiotic consumption can improve the fecal count of beneficial bacteria (especially bifidobacteria) and maintain gut health."

Nevertheless, when dysbiosis is present, as with diarrhea, prebiotics alone are not enough:
"When gut microbiota dysbiosis exists (e.g., diarrhea), prebiotics alone may not be able to return gut microbiota to its equilibrium."

In this situation where dysfunction exists, as suggested above, probiotic supplements demonstrate legitimate benefit:
"…probiotics have proven beneficial effects when dysbiosis exists."

Before leaving this discussion on the controversy about the impact of probiotic supplements on resident microflora, I would like to present one additional quote that addresses the sometimes passionate assertion by supplement companies, clinicians and the general public that organisms in probiotic supplements ***must*** enter the distal small intestine and large intestine in a viable state to be effective. While this is certainly preferred, is it absolutely necessary in order for probiotic supplements to demonstrate benefit? Khalesi et al state:
"Although viability is acknowledged as a prerequisite for the health benefits of probiotics, few interventions have reported the viability of probiotics during the period of supplementation. Evidence suggests that non-viable probiotic strains may also confer some positive health outcomes…"

Please note again the preceding quote. While it makes sense that viable organisms will be beneficial, very few studies on the clinical impact of probiotic supplements, even though they reported positive outcomes, actually investigated whether the organisms in the supplements were indeed living. It was just assumed they were living based on the positive outcome. In fact, as suggested in the above quote, it is very possible that positive results were obtained by non-viable organisms. What does this reality mean in terms of the quality probiotic products in the supplemental marketplace today? Most reputable supplement companies take every possible measure to maintain optimal organism viability. However, there is no question that minor decreases in viability may occasionally occur, most often due to increases in temperature during shipping, in the summertime. Does such an occurrence render the product "dead" and "worthless" as believed by many? As suggested by Khalesi et al, research points out that this belief has no scientific basis.

Clinical Impact of Probiotic Supplements in Healthy Populations – Immune Support

A common reason probiotic supplements are ingested preventively is to support immune function. Does clinical research support this reasoning? Published research on the subject examined by Khalesi et al considered two clinical entities – influenza and the common cold. Concerning influenza, the research was conflicted:
"…the effect of probiotic supplementation on immune responses against influenza infection in heathy adults is less consistent."

In contrast, research on probiotics and the common cold are encouraging:
"Overall, it appears that probiotic supplementation in healthy adults can improve immune function and the immune response to common cold infections."

Clinical Impact of Probiotic Supplements in Healthy Populations – Lipid Profiles and Cardiovascular Disease Risk

Some have suggested that probiotic supplements can help optimize LDL, HDL, and triglyceride levels. According to Khalesi et al, this is not true:
"There is insufficient evidence to support the role of probiotics to improve blood lipid profile."

Clinical Impact of Probiotic Supplements in Healthy Populations – GI Discomfort

As noted by the authors, it is well recognized that probiotic supplements can be very beneficial for the optimization of GI function in ailing populations:
"*Benefits of probiotic supplementation in the treatment and management of many types of diarrhea and constipation have been reported in unhealthy populations."*

However, what about the basically healthy individual who experiences occasional GI dysfunction due to stressful situations or short-term dietary indiscretions?

Research does demonstrate that probiotic supplements can also be helpful in these situations:
"Overall, it appears that probiotic supplementation may be effective at improving stool consistency, bowel movement, and reducing irritation caused by abdominal bloating."

(Continued on next page)

Ironically, in contrast to what is seen in unhealthy, chronically ailing patients, i.e., IBS, in healthy populations no one really knows what the mechanism is for the positive effects of probiotic supplements:
"The relevant mechanisms of probiotics in this action remain unclear. However, fermentation of non-digestible carbohydrates and production of short-chain fatty acids (SCFA) and carbon dioxide, removal of other intestinal gases, and the anti-inflammatory effect of probiotics have been suggested as possible mechanisms."

Clinical Impact of Probiotic Supplements in Healthy Populations – Female Reproductive System Health

There has been the suggestion over the years that probiotic supplementation via vaginal suppositories or even oral administration can help optimize vaginal health. Khalesi et al begin their discussion on this subject by pointing out the following:
"From birth until after puberty, lactobacilli are the predominant microorganisms populating the vaginal microbial environment. However, after puberty the microbial environment changes due to menstruation, hormonal changes, intercourse, infections and hygiene. This often results in a vaginal environment that is not predominant n lactobacilli bacteria for the majority of women, increasing susceptibility to urogenital infections such as urinary tract infection and bacterial vaginosis."

Can Probiotic Supplementation Demonstrate Benefit?

The authors point out:
"Four studies (five trials, one study had two arms) have examined the effects of oral supplementation or vaginal suppositories with lactobacilli as a means of improving the vaginal environment. Among these, four trials have suggested there was a significant increase in the level of vaginal lactobacilli. Supplementation with L. acidophilus, L. rhamnosus or L. fermentum increased vaginal lactobacilli levels in healthy women. The increase in vaginal lactobacilli populations seems to prevent and reduce the incidence of vaginal infections in otherwise healthy adult women."

Clinical impact of probiotic supplements in healthy populations – psychological health
As noted by Khalesi et al, psychological stress can have a profound impact on gut microflora:
"Psychological distress can reduce the number and diversity of intestinal microorganisms by changing intestinal transit time, acidity, mucus secretion, stress hormones and immune response."

With this in mind, does research suggest that probiotic supplements might be helpful with psychological symptoms in healthy adults? The authors comment:
"Collectively, evidence from these studies suggests that probiotic supplementation may improve psychological symptoms in healthy adults."

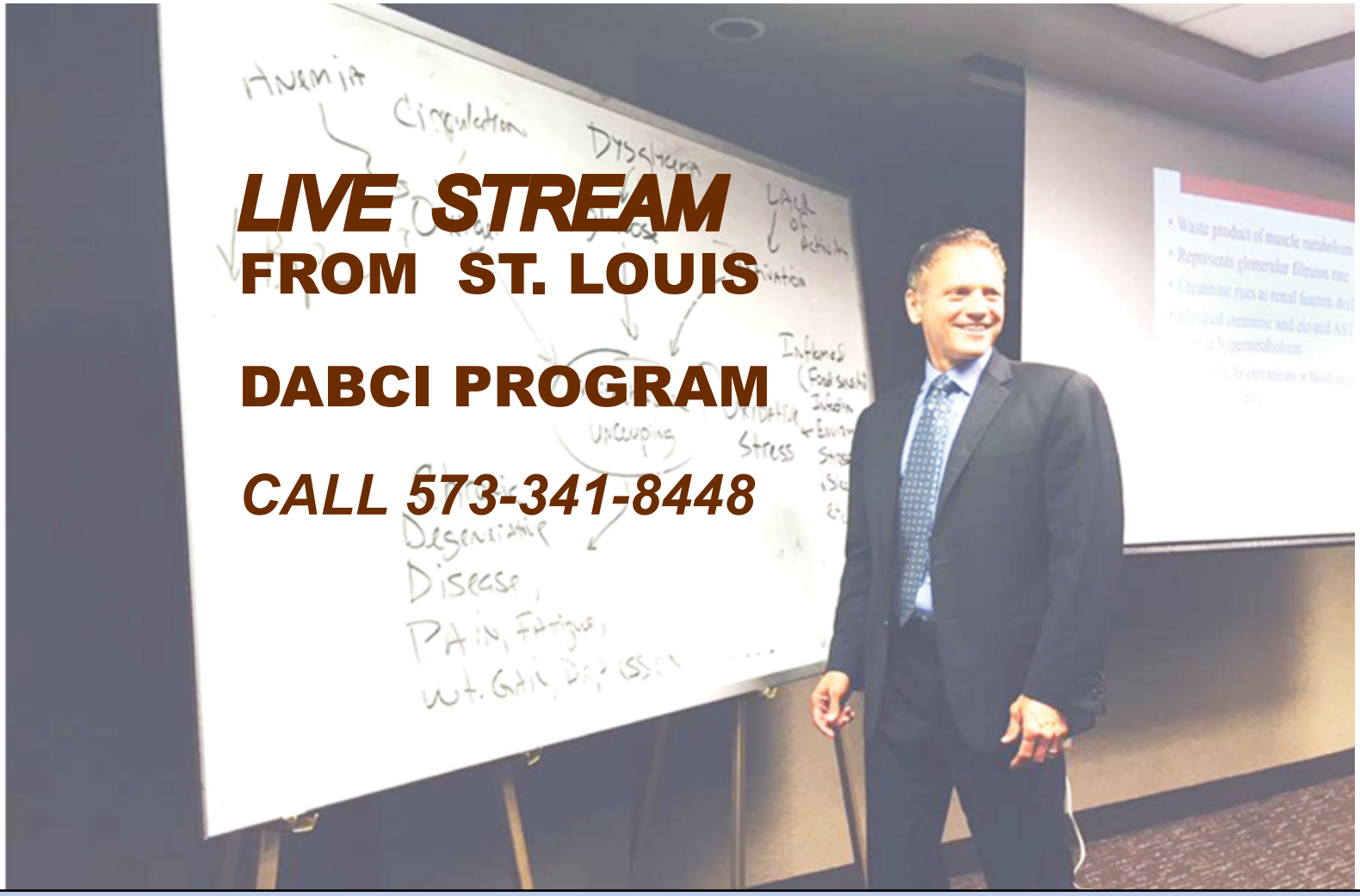
Some Final, Big Picture Thoughts

I would like to finish this review by pointing out two key points made by Khalesi et al:

Preventively, probiotic supplementation in healthy populations needs to be taken continuously to demonstrate benefit.
"…supplementation with probiotics may need to be an ongoing process in order to maintain gut microbiota changes in healthy adults. Gut microbiota is sensitive to multiple factors, such as lifestyle, aging and disease. Even in apparently healthy individuals, changes in diet quality and alcohol intake can significantly affect gut symbiosis. A diet poor in fruit and vegetable intake (as a good source of prebiotics) may not provide the food required for probiotic survival and maintenance. This may explain the constant need for probiotic food and supplements to maintain gut symbiosis and health."

Probiotic supplementation in healthy populations can have a significant impact in optimizing immune function in relation to upper respiratory infections
"The current review also suggests that probiotic consumption in healthy adults may improve immune function, particularly in response to common upper respiratory infections; reducing their incidence and/or symptom severity. This is particularly important since improved immune function via probiotics may reduce the antibiotic needs in infections, thus reducing the risk of antibiotic resistance – one of the greatest global threats of the present decade. Probiotics may enhance the immune response by activating T lymphocyte cells, increasing NK cell activity and anti-inflammatory cytokines (e.g., IL-12 and IL-14). These findings are in agreement with a recent meta-analysis (including both healthy and unhealthy populations) indicating that probiotic consumption may have a protective effect against the common cold."

Unfortunately, along with the tremendous increase in interest and usage in probiotics among both the health care community and the general public has come some major misconceptions about their properties, their clinical effects and the mechanisms underlying these clinical effects. I hope you will agree that this very timely and important paper goes a long way to help everyone, from manufacturers to clinicians and end users, gain a better understanding about the reality of the strengths and limitations of probiotic supplements. ◆



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Steroidogenic Pathway Stimulation with a T. Terrestris – E. Longifolia Mixture to Boost Endogenous Testosterone Production

by: *N.D. Victor Carsrud, MD, PhD, DC, DABCI, MBBS, MS, DCBCN*
James K. Meyer, PharmD, MS, CCN

Abstract

In an effort to stimulate the endogenous steroidogenesis pathway, a combination of *Tribulus terrestris* and *Eurycoma longifolia* (Tongkat) was given to a small pilot group of 10 men for four months. Total testosterone and estradiol were measured as a combination gauge of steroidogenesis. TSH was measured as a control for indirect metabolic effects. Total testosterone increased an average of 119 ng/dL, or 52.6% increase beyond baseline within a four month span. Estradiol increased 7.5 ng/dL, or 56.2% beyond baseline. TSH levels did not significantly change across the four month study. This represents a notable increase in endogenous hormone production within physiologically normal ranges with the direct application of exogenous hormones or precursors. A larger study will be needed for statistical significance.

Abbreviations: OTC*: Over-the-Counter;* SHBG: *Sex Hormone-Binding Globulin;* T: *Time (Testing Time);* TCM: *Traditional Chinese Medicine;* TSH*: Thyroid-Stimulating Hormone*

Citation: Carsrud, NDV, Meyer JK "Steroidogenic pathway stimulation with a T. terrestris – E. longifolia mixture to boost endogenous testosterone production", The Original Internist Vol 27, No 1, Pg 29.

Introduction

Testosterone plays a central role in the regulation of metabolic homeostasis, particularly in men. A disturbing trend of total testosterone reduction has been observed across all male cohorts in the last several decades. One study tracked a male population age 45-71 over a 15-year period and noticed a reduction in average testosterone levels of 110 ng/nL, or roughly 17% total (1.2% per year) across observed age groups.[1] Another observational study of 1532 men, showed a substantial age independent decline of testosterone levels that was not attributable to any health risks or environmental effects measured their observed data.[2]

Immediate implications become obvious in light of the dramatic increases in the rates of diabetes mellitus in the general population over the same time period. Testosterone deficiency supports glycogenesis and impairs glucose metabolism in rat models[3] and has been shown to dramatically increase the risk of mortality in diabetic men.[4] Direct cardiac pathologies are the most commonly linked cause of mortality, particularly testos-terone deficiency related coronary artery disease.[5,6] Various observations have suggested that exogenous testosterone therapy to levels near 500 ng/dl can halt or reverse these associated pathologies,[7,8] suggesting a direct therapeutic approach of normalizing testosterone values as a central intervention in the pathogenesis of both diabetes and cardiovascular disorders.[9]

However, while exogenous testosterone therapy may be used in European countries as therapeutic interventions for diabetes,[10] it's usage as a primary intervention has been limited in the United States, in part to historical concerns about implications of prostate cancer despite mounting evidence to the contrary.[11] Numerous studies have shown a correlation between exogenous testosterone usage and increased risk of cardiovascular events, though this relationship appears to be multifactoral and a direct correlation of testosterone alone is still under debate.[12,13,14] In a 2013 study, exogenous testosterone usage and cardiovascular risk were linked in a retrospective, population-based controlled study of 928,745 men. A significantly increased incidence of venous thromboembolism was shown within six months of the onset of exogenous testosterone therapy.[15] Moreover, a 2017 study showed a connection between OTC testosterone enhancing supplements to new-onset bilateral pulmonary embolism, with the author stating, "there is an inherent risk for vascular events, such as embolus, in testosterone supplement use."[16]

Competing studies, however, showed that in hypogondal men there is a potential protective effect from testosterone for cardiovascular mortality.[17] Another meta-analysis of hypogondal men showed testosterone treatment increased mildly the risk of erythrocytosis (largely correlated with supra-physiologic levels of

(Continued on next page)

testosterone), while libido and sexual function saw marked improvements.[18]

With such concerns about exogenous applications of testosterone as a therapeutic modality, the upregulation of the steroidogenic pathway via natural substances bears more scrutiny, particularly as the natural production pathways have intrinsic feedback mechanisms to avoid over production of the hormone products to supraphysiologic levels.

Tribulus terrestris, commonly used in Traditional Chinese Medicine, has been used therapeutically to improve testosterone levels and support overall male health. Its effect seems potent and age independent.[19] Studies have linked it's usage to improvements in several metrics directly related to testosterone values including semen quality and body fat composition[20] and fertility,[21] as well as direct measurement of increases in total testosterones levels.[22, 23]

In Persian and Ayurevedic medicine, *Eurycoma longifolia* is another herb which has been identified as improving testosterone values and associated metabolic markers.[24,25] E. longifolia's quassinoid effects are at least in part due to the action of as both an aromatase and phosphodiesterase inhibitor,[27] with observed increases in clinical studies on both sperm motility.[28] and bone density.[29]

Given these possible phytomedicinal interventions as an adaptogenic option to endogenous steroidogenic production, and the apparent lack of side effects that are problematic for exogenous application, the quantification of the potential increase in endogenous testosterone was performed.

Materials and Methods

A small pilot study was performed using ten volunteer males. Ages ranged between 30 and 60 years old. All had self-reported andropause symptoms of fatigue, anhedonia, libido problems, or weight gain. All participants had children, to verify reproductive efficacy. Initial testosterone values were between 120 ng/dL and 500 ng/dL, with exclusions for any OTC or prescriptive testosterone support. During the course of the study, participants were instructed not to alter their diet, exercise, medication, or supplementation regimen to minimize environmental factors altering testosterone levels.

Total testosterone, estradiol, and TSH values were measured at the beginning of the study (T0), at one month (T1), two months (T2), and four months (T3). To improve participant adherence, and given the small number of participants, this study was non-blinded. Patients served as their own control values by compareing the percentage change of each participant from their own baseline values.

Research materials were manufactured and provided gratis for the entire study by NuMedica, Inc. (Tulsa, Oklahoma), but no direct financial support or incentive was provided to any participant or researcher.

The T. terretris - E. Longifolia mixture was as follows per 2 capsule dosage:

- Zinc (as zinc bisglycinate chelate) † .....10 mg
- Longjack (Eurycoma longifolia; Tongkat Ali) (root) extract.....300 mg
- Ashwagandha (Withania somnifera) (root) extract (4.5% withanolides)…. 250 mg
- Tribulus terrestris (fruit) extract (60% saponins) .....200 mg
- Ginseng (Panax ginseng) (rhizome) extract (4% ginsenosides)…….....200 mg
- Nettle (Urtica dioica) (leaf) extract (4:1) .....100 mg
- Velvet bean (Mucuna pruriens) (seed) extract (99% L-Dopa)……..…..100 mg
- Grape (Vitis vinifera) (seed) extract (95% proanthocyanidins)……..10 mg

Participants were instructed to take 2 capsules, twice per day for four months. Labs were collected and analyzed by LabCorp.

Results

Initial testosterone value average was 308.9 ng/dL (+/- 110.8), with a range from 159 to 427. Initial Estradiol levels were at 12.3 (+/- 5.9). Subsequent months had a steady increase in both testosterone and estradiol levels across the four month study, with no increases in either into abnormal or pathologic ranges.

Results are summarized in Table 1. At the end of four months of testing, average testosterone increased to 428 ng/dL, and Estradiol increased to 19.8 ng/dL. This represents an averaged increase across four months of

(Continued on next page)

52.6% in total for testosterone values and 56.2% increase in estradiol values. TSH varied very little from month to month over the course of the study, starting at 2.24 mIU and ending at 2.42mIU.

Fig. 1: Total Values from T0 to T3 for Testosterone and Estradiol

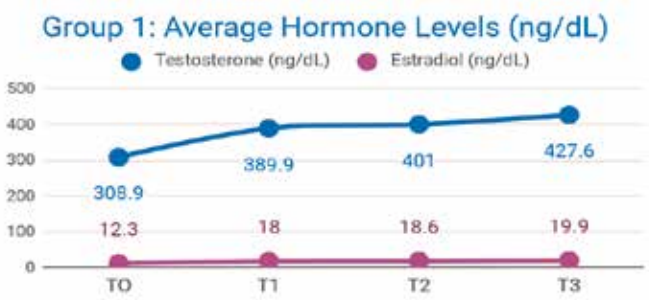

Table 1: Total Values from T0 to T3

Time Point	Avg Testosterone (ng/dL)	Avg Estradiol (ng/dL)	Avg TSH
T0	308.9 (+/- 110.8)	12.3 (+/- 5.9)	2.24 (+/- 1.6)
T1 (1 month)	389.9 (+/- 112.3)	18.0 (+/- 3.8)	2.59 (+/- 1.9)
T2 (2 months)	401 (+/- 137.0)	18.6 (+/- 4.39)	2.39 (+/- 1.8)
T3 (4 months)	427.6 (+/- 212)	19.9 (+/- 10.4)	2.42 (+/ - 1.5)

The large variation in starting baseline values across the participants necessitated standardization by comparing each patient as a percentage baseline change from their own starting values. As mentioned earlier, although variations in baseline values are common, rates of loss and gain are usually reflected at a common rate,[1]hence validating percentage comparisons as a standardization measurement. Baseline changes from month to month as a percent -age from baseline for each patient are summarized in

Table 2.

Fig. 2: Percentage Change from Patient baseline T0

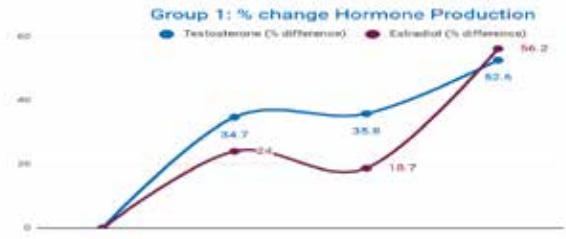

Table 2: Percentage Change from Patient baseline T0 to following time points

Compared % change	% Testosterone change	% Estradiol Change	% TSH change
T0 to T1 (1 month)	34.7%	24%	17%
T0 to T2 (2 months)	35.8%	18.7%	9.8%
T0 to T3 (4 months)	52.6%	56.2%	4.3%

Discussion

Prior clinical usages of *T. terrestris* and *E. longifolia* have both shown to raise testosterone values. This small pilot study quantified the increase in testosterone production as a result of a novel, synergistic mixture of the two phytomedicinal herbs.

Over the course of four months of therapy, pre-andropausal men were demonstrated to have an increase of total testosterone production of 52.6% above their baseline production. The steroidogenic pathway shows a close relationship in the metabolism of testosterone and estradiol, as both are part of the androgen steroids hormones. While more exhaustive testing would be required for definitive proof, the addition of these adaptogenic phytomedicinal herbs increased estradiol at a rate that mirrored the increase in testosterone (56.2%). This reflects an upregulation in the endogenous steroidogenic pathway, and not a direct supplementation of testosterone or its immediate precursors. Subsequent follow-up experiments will be needed to determine if this effect lasts beyond the course of treatment, or are dependent upon continued supplementation.

This improvement is also independent of any exogenous factors, as participants did not change diet, exercise or supplementation. Moreover, the lack of appreciable change in TSH level suggests these observations are independent of a change in endogenous metabolic rate.

There are obvious limitations to this study which should be corrected on subsequent experiments. Firstly, as a small pilot study the number of participants was low and as with all studies, greater numbers will be needed to characterize statistical significance. Second, sex hormone binding globulin increases in both level and in binding affinity with age.[30] Alterations in SHBG level and affinity will directly affect the physiologic impact of these changes, as such larger studies should include free testosterone as well as total for assessment of possible metabolic impact. Three of the participants were monitored for Free Testosterone, though this data was not collected from the initial time point, so evaluation of the trend is unclear. One of the participant's Free Testosterone increased from T1 to T2 from a 6.8 to a 12.3 ng/dL, suggesting there is an effect upon free testosterone percentage as well. This case observation within the larger study is encouraging, and suggests this is a variable to be considered in a larger study.

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Clinical usage of the mixture has suggested there is an upper limit to the stimulation of endogenous production, with case observations normalizing between 500-600 ng/dL. This potential upper limit may represent a physiologic optimal balance, but quantification of this observation will take a study with a much longer duration, as the average values in this group still appeared to be increasing on average even at the four month time point.

No significant differences across the four month study were observed in the TSH concentration. It remains unlikely, therefore, that these increases in steroidogenesis seen here are secondary to an unexplained upregulation in cellular metabolism.

If substantiated by larger studies, the implications of an endogenous stimulation of testosterone production via a non-pharmacologic intervention are far reaching. Cardiovascular disease,[31,32] diabetes mellitus,[33,34] Alzheimer's disease[35] and osteoporosis[36] have all been linked to low testosterone values in men. Given the prevalence of these disorders worldwide, and the associated observations of globally lower testosterone values, any economically affordable, non-pharmaceutical interventions that may reduce one or more of these risk factors is both beneficial to the individual patient, and has large implications for more effective and cost-effective management of these chronic disorders.

Conclusion

A novel phytomedicinal herbal combination of *Tribulus terrestris* and *Eurycoma longifolia* increased total testosterone production by 52.6% over a four month period. Estradiol production mirrored this increased production, suggesting this is an upregulation in the steroidogenesis pathways instead of direct supplementation with either exogenous hormone or precursors.

Further studies will need to be performed to further quantify this increase and establish a statistical significance, and to characterize any associated increases in the free testosterone percentage. This pilot study suggests herbal stimulation of testosterone production may be a novel addition to men suffering from low testosterone and associated sequelae including diabetes, cardiovascular disease and osteoporosis.

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NATURAL INTERVENTIONS FOR OTITIS MEDIA:
A COMMENTARY ON THE AVAILABLE EVIDENCE

by: Adrian Isaza, PhD, DC, DABCI, DACBN

Introduction

Antibiotic therapy remains the treatment of choice for otitis media in most countries despite persuasive evidence that antibiotic therapy provides limited clinical benefit and promotes bacterial resistance. Meta-analysis of randomized, placebo-controlled trials demonstrated that antibiotics increased resolution at 1 week by only 13%. Amoxicillin remains as effective as any other antibiotic, despite increasing resistance to amoxicillin among the major bacterial pathogens. Immediate antibiotic treatment has been shown to reduce the duration of symptoms by 1 day but not until after the first 24 hours when symptoms were already improving.

Yearly administration of the influenza vaccine and/or treatment of influenza with an antiviral (oseltamivir) can significantly decrease the incidence of acute otitis media during influenza season. Although pneumococcal vaccination effectively reduces the incidence of acute otitis media due to vaccine-related serotypes, there is a significant increase in the number of episodes of acute otitis media due to other serotypes of S. pneumoniae such that the overall incidence of acute otitis media is reduced only minimally by pneumococcal vaccine. The careful use of strict diagnostic criteria coupled with judicious use of antibiotic therapy will direct antibiotic treatment to only those patients likely to benefit.[1]

In 2004, Glasziou, et al, conducted a review of eight randomized controlled trials with a total of 2,287 children and concluded that antibiotics provide a small benefit for acute otitis media in children. As most cases will resolve spontaneously, this benefit must be weighed against the possible adverse reactions.[2] In 2006, Rovers, et al, conducted a meta-analysis of data from six randomized trials of the effects of antibiotics in children with acute otitis media. Individual patient data from 1643 children aged from six months to 12 years were validated and re-analyzed.

This study concluded that antibiotics seem to be most beneficial in children younger than two years of age with bilateral acute otitis media, and in children with both acute otitis media and otorrhea. For most other children with mild disease an observational policy seems justified.[3]

In 2010, Coker, et al, conducted a meta-analysis of 135 citations and concluded that otoscopic findings are criti -cal to accurate acute otitis media diagnosis. Acute otitis media microbiology has changed with use of PCV7. Antibiotics are modestly more effective than no treatment but cause adverse effects in 4%-10% of children.[4]

Natural Interventions for Otitis Media

Spinal Manipulative Therapy

In 2012, Pohlman, et al, conducted a literature review of 49 articles: 17 commentaries, 15 case reports, five case series, eight reviews, and four clinical trials where no serious adverse events were found. This literature review concluded that it is possible that some children with otitis media may benefit from spinal manipulative therapy or combined with other therapies.[5]

Breastfeeding

In 1996, Uhari, et al, performed a meta-analysis of 22 articles from six different countries. This study found that breast-feeding for at least three months reduced the risk of acute otitis media.[6]

In 2015, Bowatte, et al, carried a systematic review and meta-analysis 24 studies, all from the USA or Europe. This study provides evidence that breastfeeding protects against acute otitis media until two years of age.[7]

Propolis and Zinc

In 2009, Elemraid, et al, conducted a systematic review and concluded that supplementation studies using single micronutrients and vitamins to determine efficacy in reducing acute or chronic otitis media provided some evidence for an association of middle-ear pathology with deficiencies of zinc or vitamin A.[8] In 2010, Marchisio, et al, conducted a study of 122 children aged one to five years with a documented history of recurrent acute otitis media and found that the administration of a propolis and zinc suspension to children with a history of recurrent acute otitis media can significantly reduce the risk of new acute otitis edia episodes and acute otitis media-related antibiotic courses, with no problem of safety or tolerability, and with a

(Continued on next page)

very good degree of parental satisfaction.[9]

Probiotics

In 2013, Liu, et al, carried out a meta-analysis of four randomized controlled trials involving over 1800 participants. This study concluded that the administration of Lactobacillus rhamnosus compared with placebo has the potential to reduce the incidence of acute otitis media, the upper respiratory infections and antibiotic use in children.[10]

In 2019, King, et al, conducted a systematic review and meta-analysis of 17 randomized controlled trials with a primary aim of preventing acute respiratory tract infections, acute lower digestive tract infections or acute otitis media. This study found that probiotics, provided to reduce the risk for common acute infections, may be associated with reduced antibiotic use in infants and children.[11] Also, in 2019, Scott, et al, performed a literature review of 17 randomized controlled trials involving over 3400 children. This study revealed that probiotics decreased the proportion of children taking antibiotics for any infection.[12]

Xylitol Chewing Gum

In 1996, Uhari, et a, designed a double blind randomized controlled trial of 306-day care children who were given either xylitol (8.4 g a day) or sucrose (control) chewing gum for two months. In this study Xylitol seemed to have a preventive effect against acute otitis media.[13]

In conclusion it seems plausible to decrease the recurrence of otitis media with spinal manipulative therapy, breastfeeding, propolis/zinc suspension, probiotics and xylitol chewing gum. Further studies are warranted to confirm these results.

About the author:

Adrian Isaza is both a physician and an academic. As an academic, he authored a chapter of the book "The Role of Functional Food Security in Global Health". He also teaches graduate students at Everglades University for the Alternative Medicine Degree program.

Adrian holds a diplomate in diagnosis awarded by the American Board of Chiropractic Internists and a diplomate in nutrition awarded by the American Clinical Board of Nutrition. Moreover, he is a Certified Chiropractic Acupuncture Practitioner and has a master's degree in medical science.

Dr. Isaza recently obtained his PhD in medical sciences and practices medicine full-time in Tampa, Florida.

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Cordyceps - Cordyceps have been found to be supportive in sexual function, kidney, lung and respiratory health. This mushroom contains a powerful compound called CDP, which is involved in the proper oxygenation of cells, making it an adjunct for athletic performance. It has also been shown to have the ability to disrupt the DNA and RNA synthesis of incoming pathogens, bacteria, and viral infections playing a powerful role in immunity. This mushroom has also been found to be helpful with energy and stamina, as well as having anti-Candida properties.

Lion's Mane - Lion's Mane is a unique medicinal mushroom as it has been shown to increase REM sleep and an important brain neuropeptide called Brain Derived Neurotropic Factor (BDNF). BDNF improves the function of neurons, encourages their growth, and strengthens and protects them against premature cell death. Lion's Mane also stimulates nerve growth factor (NGF). NGF supports the protective covering surrounding our neurons, the myelin sheath, thereby supporting cognitive function and overall nervous system health.

Magnolia Bark - Magnolia bark is a powerful anti-inflammatory herb known for its ability to reduce inflammation, protect the liver and mitochondria from oxidative damage. The honokiol present in magnolia has also shown to be helpful with depressed mood and feelings of anxiety. Research has also demonstrated its benefits in some forms of cancer cells.

Ginger - Ginger is a well studied herb, known for its powerful anti-inflammatory and antioxidant effects. Gingerol is the main bioactive compound in ginger, which is responsible for much of its medicinal properties such as aiding in nausea, pain and digestion.

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Organic Cordyceps 1:1 Extract (*Cordyceps militaris*)(Fruiting Bodies)	620 mg	*	Magnolia Bark Extract 1:1 (*Magnolia officinalis*)	620 mg	*
Organic Shiitake 1:1 Extract (*Lentinula edodes*)(mushroom)	620 mg	*	Ginger Root (*Zingiber officinale*)	310 mg	*
Organic Lions Mane 1:1 Extract (*Hericium erinaceus*)(fruiting bodies)	620 mg	*			

* % Daily Value Not Established

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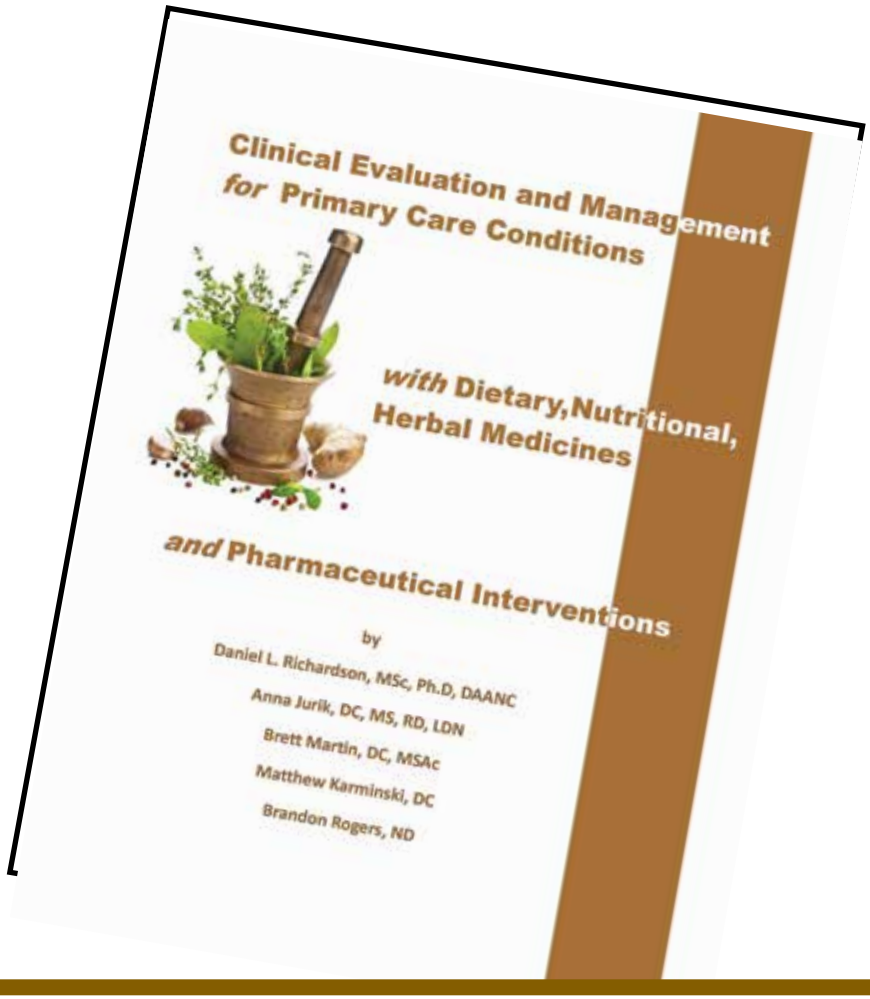

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