Exploring The Medicinal Plants For The Management of Helicobacter Pylori Associated Disorders

Moringa oleifera: A review of medical evidences for its nutritional, therapeutic & prophylactic properties

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Overview of this Research Review Paper

The perseverance of writing a review research paper, as a university student is no doubt not with the intention of getting good grades in exams but it's with the ecstasy & joy of discovering some thing no one knew before. And by reading this review research paper about the alternative treatment of the H. Pylori, this joy only those can grasp who obligate the pursue of wisdom.

Goal of this Research

As I stated that research itself is a highest form of adoration. Some time you don't achieve THE Goal that you were expecting before the research, but I believe after research what you acquire by achieving goal is not as important as what you became by doing research. Goals are important but some time goals create boundaries. Before starting this work my only Goal was

- Not to shoot the arrow in the air so where it lands I paint that A Target.

Requirements and Methods

The greatest part of writing this paper was the time that I spent in reading published research papers in order to write some thing new on this topic. It is wisely been said that a man will turn over half a library in ordered to make one book. So my only requirement were also some recent authentic published papers about my topic. I gone through these steps:

- First I downloaded 37 recent authentic published research papers
- In first reading I just highlight the important findings & select 23 papers
- In 2nd reading I labeled all the highlighted parts with corresponding titles
- In 3rd reading I categories them so they create a whole new paradigm
- Than I roughly make an outline for my review research paper
- Than I wrote its first draught and printed it for proofreading
- After editing and spelling check the final paper was ready to be print
- In final reading I also give a second sight to the impotent research facts
- I correlate all the important researches with their references
- Than I also added a few pages of Philosophical explanation of H. Pylori
- I tried to relate Tib-e-Nabvi remedies to heal the H. Pylori disorders
- Some Spiritual tips about the preventive measures are also written
- After printing the final paper I clipped it into file along with the…
- Reference research papers that I have read in order to write this paper

(For soft copies and more details, please contact via E-mail address given)

Acknowledgment

I acknowledge the lectures & supervision of my both teachers. Without their guidance & addresses this work could never be capable.

My respected teachers are ....

- **Prof Dr. Hakim Abdul Hannan Vice Chancellor Hamdard University**
- **Honorable Sir Physician Hassan Raza Sahib**

My Main Research references are

Medicinal Herbal

A complete modern book by Professor Doctor Hakim Said Shaheed.

PDR for Herbal Medicine (4th edition)

An Authentic world wide accepted research based book.

Khazain Ul Adwia

A historical manuscript about the ancient uses of medicinal plants by Allama Najm ul Ghani (Rampuri)

Text Book of Pharmacognosy and Materia Medica

A book by Professor Doctor Hakim Abdul Hannan.

National Library of Medicine National Institute of Health

NLM on the campus of NIH is the world's largest authentic online research base. Other authentic websites like PubMd, Drugs.com, and Wikipedia are visited too.

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Part One

Introduction of the Antibiotics & H. Pylori

Introduction of this Review Research File

Being a student of science I grasped it very early that the more science knows the more it realize that it knows nothing. I believe a student of science should not presume that his books are saturated with 100% correct and latest knowledge so far, thus he don't need to do further research on his relevant topic. Believe me the books of science are not the sacred books and its not a sin to doubt on the facts inscribed there, because the fact is "Facts are continuously changing all around us".

No matter who was the author of the book, no matter how much it is latest in edition, sooner or later new findings will came to replace them. Science is evolving in its knowledge, the nutritious value of certain foods, the number of chromosomes in a single human cell, the status of Pluto as a planet, the status of Heart as just a pump or even the state of our surroundings, the population of the planet, the fastest 100-meter race all facts are not the same as we were trying to memorizes in junior classes. Our knowledge is in constant flux. It turns out knowledge is a lot like radioactive atoms as it decays over time. Subsequently we now need to constantly reeducate, retrain, reskill *&* reorient ourselves with new researches and we should avoid memorization things like the ultimatum. It's not easy to shift our own and others mind. I acknowledge that efforts required changing the paradigms of a society who stuck on old beliefs. For instance the discovery of H. Pylori role in gastric ulcers was it self a big mind shift.

Not too long ago, the common belief was that excessive work and chronic stress caused stomach ulcers. Although it is true that stress can exacerbate an ulcer, but the fact is H. pylori, a spiral-shaped bacterium, is the cause of more than 90% of duodenal ulcers and up to 80% of gastric ulcers. In 1981 Dr. Marshall began on H. Pylori in the Royal Perth Hospital. He was a pathologist who, two years earlier, discovered that "the gut could be overrun by hardy, corkscrew-shaped bacteria called the Helicobacter pylori". Biopsying ulcer patients and culturing the organisms in the lab, Dr. Marshall traced not just ulcers but also stomach cancer to this H. Pylori gut infections.

The cure, he realized was the only readily available: Anti-biotics. But mainstream gastroenterologists were dismissive, holding on to the old idea that ulcers were caused by stress. Unable to make his case in studies with lab mice (because H. pylori affects only the primates) and prohibited from experimenting on the people, Marshall grew desperate.

My Motivation

This encouraging quote for medical students I penned always inspires me to ensure exploration.

"Professor Dr. David Sackett, the father of evidence-based medicine, once famously said:

"Half of what you'll learn in a medical school will be shown to be either dead wrong or out of date within the five years of your graduation; and the trouble is that nobody can tell you WHICH HALF".

I am fairly sure Prof. Doctor Sackett, was making a deliberately wild estimate when he said "half." But the point is, promptly the utmost significant thing for a medical student to learn is to learn how to learn on your own"

Ahmad Yar Sukhera

Introduction of this Review Research File

Finally Dr. Marshall ran an experiment on the only human patient he could ethically recruit: himself. He took some H. pylori from the gut of an ailing patient, stirred it into a broth, and drank it. As the days passed, he developed gastritis, the precursor to an ulcer: He started vomiting, his breath began to stink, and he felt sick and exhausted. Back in the lab, he biopsied his own gut, culturing H. pylori and proving unequivocally that bacteria were the underlying cause of ulcers. For his work on H. pylori, Marshall won a 2005 Nobel Prize. Today the standard of care for an ulcer is treatment with antibiotics. And stomach cancer once one of the most common forms of malignancy is almost gone from the Western world. That was the story depicting more than just the breakthrough of the fact that H. pylori associate with ulcers.

Pharmacognosy is the foundation and steppingstone of the field of Herbal medicine. I am pleasant that I found such a great teacher like Sir Physician Hassan Raza who always encourages us to find the truth behind the claims purposed by ancient physicians. He taught us how to research and study the scientific papers and clinical trials about your drug from deferent authentic books and websites, hence that after graduation we don't end up clamming like a layman that "this herb is for that disorder because that Physician/Hakeem told me such and such".

In this review research file I have tried to evaluate the different plants that could prove batter alternative medicine for the treatment of H. Pylori infection. Also I have tried to write the Unani philosophical explanation of H. Pylori related disorders and their symptoms. I have tried to prompt a logical explanation of these disorders & symptoms on the basis of my previous knowledge about the Principles Of Eastern Medicine (KULYAT). At the end I have written the TIB-E-NABVI remedy for H. Pylori related disorders under the section of "Philosophy of Healing".

"Prevention is better than the cure" is a famous expression in medical field, after reading few research papers I concluded that clean & healthy life style is the only way to prevent septicity of H. Pylori. ALHAMDULILLAH Islam provides us complete best advice for living a clean and healthy life. So I have also added some spiritual tips before the "Conclusion".

Imp. Highlights

This review research paper is effort to start looking up the facts to make sure that I have the most updated knowledge regarding the use of herbal plants as the alternative remedies to heal H. Pylori related disorders.

Doctor Marshall said in and interview……..

"I swizzled the organisms around in a cloudy broth and drank it. Next morning. My stomach gurgled, and after five days I started waking up in the morning saying, "Oh, I don't feel good," and I'd run in the bathroom and vomit.

After 10 days I had an endoscopy that showed the bacteria were everywhere. There was all this inflammation, and gastritis had developed. That's when I told my wife."

Introduction of the H. Pylori infection

Helicobacter pylori (H. pylori) infection is an important public health problem in several parts of the world because this pathogen is associated with various gastric diseases, ranging from mild discomfort, such as superficial gastritis, to severe ailments, such as chronic atrophic gastritis, peptic (gastric or duodenal) ulcer or gastric cancers.

Virulence factors of H. pylori

Virulence is the degree of damage caused by a microbe in its host. The H. pylori has virulence factors that are necessary to colonies the acid environment of the stomach and to survive in it; these factors are expressed in all isolates[1]. Of these, the most remarkable are urease and the adhesins. Urease metabolizes urea into ammonia and carbon dioxide, and it contributes to the neutralization of gastric acid[2]. Because the pH of ammonia is 11.0 while the original pH of stomach is ranging 1.0 to 2.0 & this acid environment also helps kill bacteria, viruses, fungi and other microorganisms that enter the stomach with food but lots of ammonia neutralizes the stomach pH. In such case stomach became unable to digest its contents specially proteins because the protease enzymes of stomach to break down protein work best in their optimum pH which is very acidic. This indigestion leads to Dysbiosis. In addition, urease is strongly immunogenic and chemotactic for phagocytes[3], and it promotes the production of the proinflammatory cytokines interleukin (IL)-1β, IL-6 and IL-8, as well as tumoural necrosis factor-alpha (TNF-α)[4,5].

Adhesion of H. pylori

H. pylori adheres specifically to the epithelial cells of the gastric mucosa by means of the adhesion proteins. Of these, the most studied are BabA and SabA, which are external membrane proteins[6,7]. The gene babA is polymorphic, occurring as babA1 and babA2[8]. Strains containing babA2 are associated with a higher risk of peptic ulcer, intestinal metaplasia and gastric cancer.

Moreover, babA2+ strains generally display the most cytotoxic genotype further increases the risk of peptic ulcer, intestinal metaplasia and gastric cancer[9,10]. Other membrane proteins that function as adhesins have been reported, including AlpA, AlpB, HopZ and HopH, also called outer inflammatory protein A (OipA) due to its association with the increased secretion of IL-8 by epithelial cells in vitro and with intense gastric inflammation in vivo[11,12,13,14].

Imp. Highlights

Approximately two-thirds of the world's population is infected with H. pylori. However, the risk of developing a duodenal ulcer in an individual infected with H. pylori is only about 1% per year, and only 10-15% of individuals with H. pylori infection develop a duodenal ulcer at any point in their life.

Some studies claims that in few H. pylori-infected individuals, acid secretion is higher than normal. This acid flows into the duodenum, leading to gastric metaplasia.

The use of too much antacid can also contribute to the overgrowth of other harmful organisms, including H. pylori, Lactobacillus, Enterobacter, Staphylococcus and the Probionibacterium.

How H. Pylori infection leads to Cancer

Studies have shown that several H. pylori virulence factors have been associated with gastric carcinogenesis. The most important of these include vacuolating cytotoxin (VacA) and the cytotoxin-associated gen A (CagA) protein. Both are especially relevant for the pathology of the infection by H. pylori, because strains that produce them have been more frequently isolated from patients with gastric cancer[15,16].

VacA is one of the most important factors determining the virulence of the pathogenic strains of H. pylori. It was first characterized by its ability to cause cell vacuolization in tissue culture cells. VacA creates pores in the membrane of the host cells, allowing the exit of chlorine and bicarbonate ions, pyruvate and urea[17,18]. VacA causes the release of iron, nickel, sugars and amino acids through the tight junctions of the gastric epithelium without affecting their integrity[19]. It has been reported that VacA interferes with the process of antigen presentation in vitro[20], induces apoptosis in epithelial cells[21] and inhibits the activation and proliferation of T and B cells in vitro[22,23]. The functions of VacA suggest that its initial activity consists in providing nutrients for the establishment of the infection. Afterwards, it contributes to the persistence and chronicity of the infection by inhibiting immune cells and altering the balance of cellular turnover; it also increases cellular proliferation and allows the persistence of mutation-carrying cells, thus contributing to the carcinogenic process.

Immune response and the disease

The development of innate immunity depends on the host's recognition of microbial pathogens through pathogen-associated molecular patterns (PAMPs), such as lipopolysaccharide (LPS), peptidoglycan, lipoproteins, flagellins or doubl- stranded RNA[24].

These PAMPs are highly conserved molecular structures that are recognized by Toll-like receptors (TLRs)[25] or by NOD-like receptors (NLRs) [26]. H. pylori LPS and flagellin are poor activators of TLR-4 and TLR-5, respectively. H. pylori LPS has a weak endotoxic activity compared to Salmonella typhimurium LPS[27] and is a weaker inducer of pro-inflammatory cytokines than Escherichia coli LPS[28]. The H. pylori flagellin is weakly recognized by TLR-5 and it is not pro-inflammatory[29,30]. H. pylori avoids an initial innate response by preventing intense immune activation; thus, it can colonies the gastric mucosa.

Imp. Highlights

H. pylori is also implicated in these diseases, in addition to peptic ulcer: Stroke, Atherosclerosis, Insulin resistance, Autoimmune diseases, Heart disease, Skin disorders including Rosacea and possibly Chronic Hives, some cancers including MALT lymphoma and stomach cancer.

Economics of the H. pylori infection

Health care is becoming more and more expensive as accompanied by the increase in the standards of living. In an estimate I have calculated that it cost almost 2796 rupee for triple therapy in a single patients, without lab test and endoscopy which is also 4 to 7 thousand costs per patient. But an herbal remedy did not cost too much because most of the things are already present in your kitchen or garden. Also for starting herbal remedies you don't need to done tests before and after because due to no side effects a healthy person also can use them.

H. Pylori after stabling the infection

Once the H. pylori infection is established, both cellular and humoural adaptive immunities are developed: naive T helper (Th) CD4+ cells differentiate into Th effector cells (cellular response), and B cells that produce specific antibodies are activated (humoural response) [31]. However, there is evidence indicating that B cells and antibodies are dispensable for H. pylori control[32,33], whereas Th1 and Th17 effector T cell subsets and their cytokines are essential for the control of the infection[34,35].

Th1 cells produce the pro-inflammatory cytokines gamma interferon (IFN-γ) and tumor necrosis factor α and β that stimulate innate and T-cell immune responses[36]. Th17 cells are a recently identified class of effector T cells that produce pro-inflammatory cytokine IL-17. This interleukin stimulates fibroblasts, endothelial & epithelial cells, and gastric & lamina propria mononuclear cells to produce a diversity of cytokines and chemokines; this process results in neutrophil infiltration that contributes to H. pylori-associated inflammation[37]. Despite the local and systemic response against the infection, H. pylori can subvert and/or modulate the adaptive immunity perpetuating the infection and chronic inflammation[38].

In most individuals, the H. pylori infection can continue throughout life as an asymptomatic condition. Unfortunately, its persistence in the stomach causes chronic gastric inflammation and tissue damage, leading to alterations that could evolve to severe gastric diseases such as peptic ulcers, gastric cancer or mucosa associated lymphoid tissue lymphoma. Therefore, eradication appears to offer the most direct approach to reducing the enormous human and economic consequences of H. pylori infection[39,40].

Main reason of Triple Therapy treatment failure

The main reasons for treatment failure are antimicrobial resistance and patient non-adherence. The lack of treatment compliance by the patient is a basic factor that explains the low rates of bacterial eradication.

The cause is the complexity of the therapy, which involves at least three drugs, administered in repeated doses for a long time. Consequently, there are side effects, which, coupled with a lack of immediate improvement, discourage the patient to continue with the therapy. The high cost of anti-Helicobacter pylori treatments is another drawback in the countries like Pakistan, yes we should consider the cost too.

Imp. Highlights

H. pylori is the only bacterial organism in the stomach that cannot be killed by hydrochloric acid. It has adapted to survive in the stomach mucosa, and produces substances that weaken the stomach's protective mucus and make it more susceptible to the damaging effects of acid and pepsin.
H. pylori can also grow in the small intestine, sticking to epithelial cells. This adherence leads to a variety of second-messenger signals, which invoke an immunologic response against those cells causing mucosal damage by host neutrophils.
H. pylori affects the gastric and duodenal mucous layer because this organism produces proteases that degrade the protective mucous layer. Moreover, H. pylori infection decreases the production of epidermal growth factor which normally promotes healing.

Introduction of the H. Pylori infection

The eradication rates of H. pylori with proton pump inhibitor (PPI) or colloidal bismuth based triple therapy, are around 85%-90%. However, antibiotic resistance in H pylori has increased over the past few years. The incidence of primary resistance to metronidazole is over 50%[41] and to clarithromycin is about 18%[42].

MODES OF TRANSMISSION

Several modes of transmission of H. pylori have been described in the literature; these included direct contact between subjects, which is considered the most common mode, contaminated water sources and food[41], and less commonly, iatrogenic transmission (during endoscopies and dental care) [43] and zoonotic transmission.

Role of spouse-to-spouse in transmission

In a recent study in Germany, prevalence of infection was 34.9% among women whose partners were infected and 14.5% when the partner was not infected. Malaty reported that if one spouse is positive for H. pylori then 68% of spouses turn positive, while if negative 9% of spouses were found positive.

Treating H. pylori— by PPI & NSAIDs

When it comes to calming down the burning pain of an inflamed stomach lining or ulcer, reducing the amount of acid in the stomach may seem like a good idea. But two new studies with laboratory mice, indicate it could be exactly the wrong thing to do. Mice treated with prescription drugs called Proton Pump Inhibitors or PPIs, which block acid production, acquired more bacteria and developed more inflammatory changes in their stomach linings than untreated mice did.

Non-steroidal anti-inflammatory drugs (NSAIDs), (aspirin, ibuprofen, and naproxen sodium) make your stomach susceptible to the harmful effects of acid and pepsin. They are believed to inhibit prostaglandins, substances that help maintain blood flow to the stomach, and protect the area from injury. And once injured, the stomach acid eats into the tissues. About 15% of people who take NSAIDs on a regular basis have gastric or duodenal ulcers. People who take NSAIDs and are infected with H. pylori are at least 61 times more likely to have ulcers of the stomach and/or duodenum than non-users and noninfected people. [44]

Imp. Highlights

Studies suggest that the main critical period of life for acquiring H. pylori infections is the first 5 years of childhood and at adulthood were married couples living together. For the general population it appears that the most likely mode of transmission is direct contact, by either the oral-oral route (through vomitus and saliva) or perhaps the fecal-oral route. Waterborne transmission, probably due to fecal contamination, may also be an important source of infection, especially in parts of the world in which untreated water is common.

H. pylori is more common in smokers. Smoking is also believed to slow down the healing process of an existing ulcer, and contribute to ulcer recurrence.

Introduction of the antibiotics

Throughout history, the major killer in wars had been infection rather than battle injuries. In World War I, the death rate from bacterial pneumonia was 18 percent; but in World War II, it fell, to less than 1 percent.

All of that changed when antibiotics arrived. Infections that had been a death sentence became something you recovered from in days. It seemed like a miracle but just two years later, the drug's discoverer Sir Alexander Fleming warned that its benefit might not last.

Fleming's prediction was correct. Penicillin-resistant staph emerged in 1945, while the drug was still being given to only a few patients. And we stand today on the threshold of the post-antibiotic era, in the earliest days of a time when simple infections such as the one scratch from a plant can kill a man, will kill people once again. In fact, they already are. People are dying of infections again because of a phenomenon called antibiotic resistance.

Briefly, it works somewhat like this. Bacteria compete against each other for resources & for food by manufacturing lethal compounds that they direct against each other. And other bacteria, to protect themselves, evolve defenses against that chemical attack.

As a biologist, Fleming knew that evolution was predictable: sooner or later, bacteria would develop defenses against the compounds the nascent pharmaceutical industry was aiming at them. But what worried him was every inappropriate prescription and insufficient dose given in medicine would kill weak bacteria but let the strong survive and bacteria can produce another generation in as little as twenty minutes.

It seams like we are running out of weapons in the war on germs. Germs can go through a generation in 20 minutes, instead of the 20 years it takes us humans to reproduce ourselves, this is 5 lakh times faster than us and during that quicken time scale, bacteria have found a lot of different ways to respond to our antibiotics.

There is no doubt that germs are evolving resistance to our chemical weapons, as rapidly as we develop them.

Imp. Highlights

Sadly, during this paper reading with the passage of every 3 minute, 4 person somewhere in the world that were alive will be dead from the problem called ANTI BIOTIC RESISTANCE and If we allowed it to grow unchecked the number of deaths would balloon to 60 in every 3 minutes by 2050.

Dr. Thomas Frieden, the director of the U.S. Centers for Disease Control and Prevention, issued a blunt warning: "If we're not careful, we will soon be in a POST ANTI-BIOTIC era. For some patients and some microbes, we are already there."

"As surprising as it is, stomach acid production is actually increased after drinking milk, and does not relieve stomach ulcers." (45)

Introduction of Antibiotic resistance

In 2008, doctors in Sweden diagnosed a man from India with a different infection resistant to all but one drug that time. The gene that creates that resistance, known as NDM, has now spread from India into Pakistan, China, Asia, Africa, Europe, Canada, and the United States. If you are thinking that these cases are exceptional, It would be natural to hope that these infections are extraordinary cases, but in fact, in the United States and Europe, 50,000 people a year die of infections, which no drugs can help.

A project chartered by the British government known as the "Review on Antimicrobial Resistance" estimates that the worldwide toll right now is 700,000 deaths a year they also predicts that if we can't get this under control by 2050, not long, the worldwide toll will be 10 million deaths a year.

How did we get to this point?

The honest answer is, "We did it to ourselves". Resistance is a predictable biological process, but we bear the responsibility for accelerating it. We did this by squandering antibiotics with a heedlessness that now seems shocking. 50 percent of the antibiotics given in hospitals are unnecessary. 45 percent of the prescriptions written in doctor's offices are for conditions that antibiotics cannot help. And that's just in healthcare.

Can we avert or stop it?

There are companies working on novel antibiotics but that probably won't be enough because fact is evolution always wins. Bacteria birth a new generation every 20 minutes. It takes pharmaceutical chemistry 10 years to derive a new drug. Every time we use an antibiotic, we give the bacteria billions of chances to crack the codes of the defenses we've constructed. There has never yet been a drug they could not defeat. Because its how Mother Nature works, if bacteria had not learnt how to develop resistance, all life on earth, including humans would already have died. Just like us bacteria also want to survive and just like us they are also very adaptable. It's a Fact that when we try to kill all disease organisms on this planet ultimately we are acting to kill our selves by decreasing our immunity strength to level zero.

Imp. Highlights

In an interview shortly after Sir Alexander Nobel prize, this is what he said:

"The thoughtless person playing with penicillin treatment is morally responsible for the death of a man who succumbs to infection-n with a penicillin-resistant organism" He added, "I hope this evil can be averted."

Accepting the 1945 Nobel Prize in Medicine, he said: "It is not difficult to make microbes resistant to penicillin in the laboratory by exposing them to concentrations not sufficient to kill them... There is the danger that the ignorant man may easily underdoes himself and by exposing his microbes to non-lethal quantities of the drug that will make them resistant."

Introduction of the new Antibiotic era

Thus we have no options? Its not mean that there are not options for us, there are options but for those who want to truly empower themselves and their families and prepare for the time that is so quickly approaching us. There is a beautiful quote by Albert Einstein "The significant problem we face cannot be solved at the same level of thinking we were at when we create them".

Hence we have to change our way of thinking....

First we have to understand that why we have bacteria in our body and are all bacteria are harmful or some a good and friendly. The fact is our body is full of bacteria, there are actually more bacteria cells in our body than there are human cells. There are more bacteria in our intestine then there are people on earth. And they are usually friendly and actually help us in lots of ways. Humans have used bacteria to help us in other ways for thousand of years. Bacteria are used to make yogurt and cheese. The flavor of these foods comes from bacterial byproducts; not exactly bacteria poop but close to that one. Bacteria can produce oxygen for us to breathe – some Scientist estimate it could be as much as half of the oxygen we breathe. So it should be clear that we don't have to eat poisons in the name of antibiotics to kill our all bacteria. It is now scientifically proven that Anti-fungals, Anti-virals and antibiotics destroy the natural flora of the Intestines and thus provide a route for pathogens to enter the body in larger numbers. The bacteria that colonize our bodies are friendly, mutualistic bacteria. All of our co-evolutionary bacteria generate antibiotic substances that kill off other, less friendly bacteria. The Streptococcus bacteria that normally live in our throats produce large quantities of antibacterial substances that are specifically active against the Streptococcus bacteria that cause strep throat.

Consequently we have to use such Drugs that have ability to kill harmful bacteria without harming our natural flora. Thus, Do we have such drugs? Yes we have, Mother Nature provided us with such drugs that miraclelly help us against pathogens. The purpose of this review research paper is to tell people such practice information that encourages personal independence in harmony with the Mother Nature.

Imp. Highlights

Here it is what happened next:

Penicillin was Widely distributed in 1943 and widespread penicillin resistance arrived by 1945. Vancomycin arrived in 1972, vancomycin resistance in 1988. Imipenem in 1985, and resistance to imipenen in 1998. Daptomycin, one of the most recent drugs, in 2003, and resistance to it just a year later in 2004.

An Israeli study conducted in Kenya found that H. pylori were more prevalent in people who had dyspepsia than those who did not (71% vs. 51%), particularly in people younger than 30 years old. (46)

THIS IS ASYMMETRIC WAR!

To find new drug lets find what really drug means

When I was trying to find new drugs, the word "Drug" itself helps me very much. The word drug derived from an old Duch word 'droog' meaning "to dry" as plants were dried to be used as medicines. Plants are the people's medicine, they have been since we emerged out of ecological matrix of this planet and they still are.

But why plants lose their popularity as drug?

There could be much answer of this question but what I concluded, they lose their popularity and adaptability because Science can't prove their method of action against diseases. That's why scientists only borrow most powerful compound from an affective plant and convert it into chemical forms in the shape of tablets and capsules. They certainly can illustrate the mechanism of action of a single chemical, for business.

It is easy to demonstrate how 2 compounds can work synergically to cure a certain ailment but it is very difficult so far for the scientists to figure out how 200 or 2000 different compounds can work synergically. So the scientists are reluctant to consider the remarkable synergistic suits of compounds that have evolved naturally in the plants. But the Wise Physician cannot afford to ignore these. He know when we borrow the antibiotic compounds from a plant, we do better to borrow them all, not just a single solitary most powerful among them. We lose synergy when we take out the solitary compound and also we facilitate the germs in their ability to outwit the mono chemical medicine.

Plants have been dealing with bacteria a great deal longer than the human species has being existed, some 700 million years. Plants posses certain attribute pharmaceuticals never will. Their chemistry is higher complex, too complex for resistance to occur. Plants have developed sophisticated response to bacterial invasion over million of years. Plants are free and every person can easily learn how to identify them and make medicine from them.

Question is if we know that much, than why we don't act on it?
Actually knowing something & intelligently acting on it are two different things, there is perhaps nothing more difficult than acting on what we know to be the sensible thing to do.

Imp. Highlights

"The polychemicals synergistic mix evolved in medicinal plants is now our last hope for confronting drug-resistant bacteria".

Synergistic herbs increase the activity of other herbs. They boost inactive resistant bacteria mechanisms, increase the presence of antibacterial agents in the body and enhance immune functions.

The human species, as a group, has never really been known for doing the sensible thing before it is too late.

We will stop using antibiotics only when they truly fail to work, for some they already fail to work.

Hint (MDR-Tuberculosis)

Part Two

The Moringa oleifera

Introduction of the Moringa oleifera

Growing up in Punjab this humble tree grew in our backyard and it never caught my attention, though I always loved the vegetable that grew on it. As I entered into the world of Herbal Medicine I learnt about this on of the most nutritious tree in the world called Moringa oleifera (Sohanjna).

Etymology

Word Moringa derives from the Tamil word, murungai or Malayalam word, murinna (alternately muringa). Numerous other common names for Moringa exist in different languages worldwide.[47]

Scientific Classification

Kingdome	Plantae
Order	Brassicales
Family	Moringaceae
Genus	Moringa

Species

Moringa contains 13 species from tropical and subtropical climates that range in size from tiny herbs to massive trees. The most widely cultivated species is Moringa oleifera, a multipurpose tree. M. stenopetala, an African species, is also widely grown, but to a much lesser extent than M. oleifera. As Moringa spread from India to other tropical and subtropical areas, it adapted to local conditions.[48]

1	**Moringa**	oleifera (Pakistan, India)
2	**Moringa**	arborea (Kenya)
3	**Moringa**	borziana
4	**Moringa**	concanensis
5	**Moringa**	drouhardii (Madagascar)
6	**Moringa**	hildebrandtii
7	**Moringa**	longituba
8	**Moringa**	ovalifolia
9	**Moringa**	peregrine
10	**Moringa**	pygmaea
11	**Moringa**	rivae
12	**Moringa**	ruspoliana
13	**Moringa**	stenopetala (Africa)

Imp. Highlights

Moringa oleifera (Drumstick tree) is a tree that bears fruits, flowers, and leaves; beyond medicinal usage, it has a large degree of potential as an economical herb due to its resistance to drought and very rapid growth.
M. oleifera is a fast-growing, deciduous tree[49]. It can reach a height of 10–12 m (32–40 ft)[50] and the trunk can reach a diameter of 45 cm (1.5 ft) . The bark has a whitish-grey color and is surrounded by thick cork. Young shoots have purplish or greenish-white, hairy bark. The tree has an open crown of drooping, fragile branches and the leaves build up a feathery foliage of tripinnate leaves.[51]

Nutrients of the Moringa oleifera

Vitamin & Mineral Content of Moringa[52]

All values are per 100 grams of edible portion.

Vitamins and Minerals contents	Fresh Leaves	Dried Leaves
Carotene (Vit A)	**6.78 mg**	**18.9 mg**
Thiamin (Vit B1)	0.06 mg	2.64 mg
Riboflavin (Vit B2)	0.05 mg	20.5 mg
Niacin (Vit B3)	0.8 mg	8.2 mg
Vitamin C	220 mg	17.3 mg
Calcium	440 mg	2,003 mg
Carbohydrates	12.5 g	38.2 g
Copper	0.07 mg	0.57 mg
Fat	1.70 g	2.3 g
Fiber	0.90 g	19.2 g
Iron	0.85 mg	28.2 mg
Magnesium	42 mg	368 mg
Phosphorus	70 mg	204 mg
Potassium	259 mg	1,324 mg
Protein	6.70 g	27.1g
Zinc	0.16 mg	3.29 mg
Calories	0.16 mg	3.29 mg

Amino acid Content of Moringa

All values are per 100 grams of edible portion.

Essential Amino acids: Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, Valine.

Non-essential Amino Acids: Alanine, Arginine, Aspartic Acid, Cystine, Glutamine, Gl ycine, Histidine, Proline, Serine. [53]

Amino Acid Contents	Fresh Leaves	Dried Leaves
Arginine	406.6 mg	1,325 mg
Histidine	149.8 mg	613 mg
Isoleucine	299.6 mg	825 mg
Leucine	492.2 mg	1,950 mg
Lysine	342.4 mg	1,325 mg
Methionine	117.7 mg	350 mg
Phenylalinine	310.3 mg	1,388 mg
Threonine	117.7 mg	1,188 mg
Tryptophan	107 mg	425 mg
Valine	374.5 mg	1,063 mg

Imp. Highlights

Flowers are fragrant and bisexual, surrounded by five unequal, thinly veined, yellowish-white petals. The flowers are about 1.0 -1.5 cm (1/2")long and 2.0 cm (3/4") broad. They grow on slender, hairy stalks in spreading or drooping later flower clusters which have a length of 10–25 cm. Flowering begins within the first six months after planting. In seasonally cool regions, flowering only occurs once a year between April and June.

In more constant seasonal temperatures and with constant rainfall, flowering can happen twice or even all year-round.

The fruit is a hanging, three-sided brown capsule of 20–45 cm size which holds dark brown, globular seeds with a diameter around 1 cm. [54]

Nutrients of the Moringa oleifera

From Shoots to the Roots

The leaves contain [55]

- 20.72–25.29% protein by dry weight (5.4% wet weight) which is higher than other vegetable leafs.
- Fatty acids 5.37-5.75% of dry weight (1.19–2.77% wet weight) again higher than other vegetable leafs with at least one source stating 12.5% dry weight.
- Carbohydrates at 37.98% of which 12% is sugars.
- Dietary fiber at 13.71%.
- An ash content in the range of 8.53-15.09% dry weight.
- Calcium at 870-3,468mg/100g dry weight
- Phosphorus at 228-600mg/100g dry weight
- Magnesium at 300-831mg/100g dry weight
- Sodium at 0.05% leaf dry weight (50mg/100g)
- Potassium at 300mg/100g dry weight (0.3%)
- Copper at 960-1,170µg/100g dry weight
- Manganese at 11.28mg/100g
- Zinc at 2.04mg/100g
- Iron at 105mg/100g
- A phenolic content of 181.3–200.0mg/100g catechin equivalents
- Phytate (31.1mg/g dry weight)
- Oxalate (4.1mg/g dry weight)

The Flowers contain [56]

- 1,931mg/100g gallic acid equivalents (phenolic content) at 8.69% by weight.
- Protease enzymes.

The Seeds contain [57]

- 20-30% protein (pods)
- 35-45% fatty acids (seeds) which are mostly odorless and colorless and consists of mostly (73%) oleic acid with less than 1% polyunsaturated fatty acids, which gives the oils good oxidative stability
- A chitin binding protein and an α-Mannosidase (kernals)

Imp. Highlights

Moringa leaves are exceptionally nutritious. When fresh, they are rich in vitamin C. When carefully dried, gram for gram Moringa leaves contain 24 times the iron of spinach, 16 times the calcium of milk, 9 times the vitamin A of carrots, many times the potassium of bananas, and every essential amino acid your body needs.

The tree is often referred to as "Mother's Best Friend", which is understandable when you learn that Moringa contains a unique combination of vitamins, minerals and amino acids that make it one of the most nutritious plants ever discovered. Much of the plant is edible by humans & animals.

From Shoots to the Roots Nutrients

The stem contains [58]

- Protein at 9.56-12.77% dry weight
- A 1.98-2.00% fatty acid content dry weight
- A 6.65-8.41% ash content dry weight
- Calcium at 780-1,562mg/100g dry weight
- 71.9–134.4mg/100g catechin equivalents (phenolic content)

The root contains [58]

- Protein at 5.29-7.07% dry weight
- Fatty acids at 1.00-1.38% dry weight
- An ash content of 2.91-6.48% dry weight
- Calcium at 761-2,247mg/100g dry weight
- 68.8–93.8mg/100g catechin equivalents

Medicinal Bioa ctives In Moringa Plant[59]

Medicinal bioactives in Moringa oleifera (leaves unless otherwise specified)

- Isothiocyanates such as 4-{(2'-O-acetyl-α-L-rhamnosyloxy) benzyl} isothiocyanate (RBITC; a 2'-acetylated glycoside of benzylisothiocyanate) and a 4'-acetylated variant (seeds) as well as a fully nonacetylated 4-(alpha-L-Rhamnosyloxy) benzyl isothiocyanate. The total glucosinolates in the leaves have been quantified in the 63-114mg/g dry weight range (favoring young leaves) which is higher than the root (43mg/g) but lower than seeds (200mg/g), with the leaves claimed to be higher than plants in the brassicaceae family of plants
- Moringine, which is a protonated Benzylamine as well as p-hydroxybenzoate
- The indole alkaloid N,α-L-rhamnopyranosyl vincosamide
- The pyrrole alkaloid pyrrolemarumine (4″-O-α-L-rhamnopyranoside) and its glycosides
- Marumosides A and B (glycosides of 4'-hydroxyphenylethanamide, which is literally Paracetamol)
- Carbamates known as Niazimin A-B and Niazicin A-B and thiocarbamate glycosides such as Niaziminin A-B
- The carbamate O-ethyl-4-{(alpha-L-rhamnosyloxy)-benzyl} carbamate
- The nitrile glycoside (mustard oil glycosides) known as Niazirin (70mg per gram crude extract, or 7% of the pods) and Niazirinin (the 4'-O-acetylated version of Niazirin)

Imp. Highlights

When looking at the overall macronutrient and phenolic contents, the stem and root portions of the plant appear to have less of all bioactives of interest (phenolics, proteins, and fatty acids) which supports the usage of the leaf extracts as the medicinal component. The flowers seem to have a high phenolic content, and similar to most seeds the seeds of Moringa oleifera mostly proteins and fatty acids.

There may be a mechanistic connection between Moringa oleifera and both sulfuraphane and garlic, two relatively potent chemoprotective and heart healthy supplements.

- Nitrate at 5mM/100g dry weight
- Pterygospermin
- Crypto-chlorogenic acid (leaves at 0.01-0.1% dry weight)
- Quercetin (795-975µg/g dry leaf weight and 845µg/g in flowers), Rutin, quercetin 3-O-βD-(600-O-malonyl-glucoside, and the isomer Isoquercetin (0.01-0.12% of the leaves dry weight)
- Kaempferol (216-2,100µg/g leaf dry weight and 2,802µg/g in flowers), its 3-glucoside Astragalin (0.02-0.16% of the leaves dry weight), and its rhamnoglucoside
- Procyanidins
- 4-O-caffeoylquinic acid, 5-O-caffeoylquinic acid, and glucosides thereof
- Protease inhibitors (leaves and seeds) with activity against serine proteases (trypsin and chymotrypsin) and bacterial proteases, but was ineffective against subtilisin, esperase, pronase E, and proteinase K

Physicochemical Properties

The seed oil, due to being approximately 73% oleic acid (a monounsaturated fatty acid) and less than 1% polyunsaturated fatty acids exhibits a high degree of oxidative stability, exceeding the stability of other oleic-acid rich oils such as Olive Oil, high-oleic sunflower, meadowfoam, macadammia, hybrid safflower, safflower, almond and apricot oils. (62)

The leaves of Moringa oleifera are said to have a hot taste (hot, radishy, and pungent) which begets the nickname of this tree being Horse Radish Tree. (63)

The gum derived from Moringa oleifera appears to have emulsifying properties, which under experimental conditions, exceeds that of gum acacia when at similar concentrations (2-4% of a 30% castor oil solution). (64)

Protect Against Arsenic Toxicity

The leaves and seeds of Moringa may protect against some of the effects of arsenic toxicity, which is especially important in light of news that common staple foods, such as rice, may be contaminated. Contamination of ground water by arsenic has also become a cause of global public health concern, and one study revealed: "Co-administration of M. oleifera [Moringa] seed powder (250 and 500 mg/kg, orally) with arsenic significantly increased the activities of SOD [superoxide dismutase], catalase, and GPx with elevation in reduced GSH level in tissues (liver, kidney, and brain).(65)

Imp. Highlights

A 70% ethanolic extract or 50% methanolic extract appears to be most suitable for phenolic and flavonoid extraction and 60 minutes of extraction at 90°C is also desirable; Myricetin(60) does not appear to be present in leaves nor flowers.

It should be noted that the main bioactive of Moringa oleifera contains an isothiocyanate group (-N=C=S) which is similar to Sulforaphane and this group is thought to be a hydrogen sulfide (H2S) donating group; it so, then Moringa oleifera has a possibility to increase H2S signalling which underlies most benefits of Garlic supplementation. (61)

From Shots to the Roots Phytochemicals

Phytochemicals are, in the strictest sense of the word, chemicals produced by plants. Commonly, though, the word refers to only those chemicals which may have an impact on health, or on flavor, texture, smell, or color of the plants, but are not required by humans as essential nutrients. An examination of the phytochemicals of Moringa species affords the opportunity to examine a range of fairly unique compounds. In Short every part of the Moringa tree is said to have beneficial properties that can serve humanity.

Part	Phytochemical constituents
Leaves	Glycoside niazirin, niazirinin and three mustard oil glycosides 4-[4'-O-acetyl- α -L-rhamnosyloxy) benzyl] isothiocyanate, niaziminin A and B 14-15
Flowers	D-mannose, D-glucose, protein, ascorbic acid, polysaccharide 16
Bark	4-(α-L-rhamnopyranosyloxy)-benzylglucosinolate 10
Gums	L-arabinose, D-galactose, D-glucuronic acid, L-rhamnose, D-mannose, D-xylose and leucoanthocyanin 12-13
Stem	4-hydroxymellein vanillin, β-sitosterone, octacosanic acid and β-sitosterol 11
Pods	Nitriles, isothiocyanate, thiocarbanates, O-[2'-hydroxy-3'-(2''-heptenyloxy)]-propylundecanoate, O-ethyl-4-[(α -1-rhamnosyloxy)-benzyl] carbamate, methyl-p-hydroxybenzoate and β-sitosterol 14-15
Seeds	Crude protein, Crude fat, carbohydrate, methionine, cysteine, 4-(α-L-rhamnopyranosyloxy)-benzylglucosinolate, benzylglucosinolate, moringyne, mono-palmitic and di-oleic triglyceride 10
Oils	Vitamin A, beta carotene, precursor of Vitamin A 17-18
Roots	4-(α-L-rhamnopyranosyloxy)-benzylglucosinolate and benzylglucosinolate 10
NOTE	Moringa contain many hundreds of active chemicals. I have posted in the back of this file almost entire list of chemicals so far discovered yet.

Imp. Highlights

Iron

25 Times the Iron of Spinach. Iron is necessary for many body functions including the formation of haemoglobin and brain development function.

Calcium

7 Times the Calcium of Mil. Calcium builds strong bones and teeth, and helps in preventing osteoporosis.

Potassium

15 Times the Potassium of Bananas Potassium is essential for the proper functioning of the brain and nerves.

Most Famous Researches Outcomes

Moringa also contains, not one, not two, not three, but over 40 antioxidants. Moringa is said to contain 539 known compounds, which according to traditional Unani, African and Indian medicine is said to prevent of 300 diseases and maladies.
"The nutritional properties of Moringa are now so well known that there seems to be little doubt of the substantial health benefit to be realized by consumption of Moringa leaf powder in situations where starvation is imminent." (Jed W. Fahey)

Outcome	Research Results
Milk Production	When 250mg of Moringa oleifera is taken twice daily, there is a time dependent increase in milk production; the lone study noted that the increase relative to placebo on the third day of supplementation was to 265% of placebo (a 165% increase).
Astha	Non-allergic asthmatic symptoms were reduced in a pilot study using the seeds of Moringa oleifera.
Blood Glucose	There appears to be a decrease in postprandial blood glucose following a meal in type II diabetics (21%), and this hypoglycemia may apply to non-diabetics based on rodent research, and appears to increase with time.
HbA1c	The reduction of HbA1c noted is minor, from 7.8% down to 7.4% with 90 days supplementation of the leaf extracts.
Lung Function	Respiratory capacity (as assessed by breath testing) in persons with non-allergic asthma (most of whom were smokers) appears to be enhanced following supplementation of the seeds of the Moringa oleifera.
Skin Moisture	Topical application of a 3% Moringa leaf cream for three winter months appeared to increase skin hydration status relative to control cream.
Wrinkles	Application of a 3% Moringa leaf cream for three winter months in young adult males appeared to reduce visual wrinkles on the cheeks relative to control cream.
Note	In this review research paper I have tried to summaries categorically all the very important researches done on Moringa far with respect to the body organs & systems.

Imp. Highlights

Vitamin A

10 Times the vitamin A of Carrots. Acts as a shield against a variety of diseases, eg. eye, skin, heart disease, and diarrhea

Protein

9 Times the Protein of Yoghurt. Protein is necessary for maintaining of healthy muscles, skin, hair nails and brain cells.

Vitamin C

12 Times the vitamin C of Orange. Vitamin C strengthens the immune system and fight bacterial infections such as cold and flue.

Research Research Research

Interaction with Nervous System (NS)

GABAergic Neurotransmission

2,000mg/kg of the leaf extract (ethanolic) to mice is able to protect mice from pentylenetetrazol-induced convulsions.

250 to 2,000mg/kg of the ethanolic leaf extract causes dose dependent sedation and toxicology tests which failed to note toxicity have noted that a main side effect of doses of the water leaf extract (above 3,200mg/kg) are sedation and reduced locomotion.(66)

Adrenergic Neurotransmission

In rats given 250mg/kg of the ethanolic leaf extract, it appears that there is an increase in noradrenaline concentrations in the cerebral cortex (44%) and hippocampus (25.6%) relative to control but a non-significant change in the caudate nucleus.(67)

Dopaminergic Neurotransmission

There appears to be a statistically significant increase in dopamine concentrations of the caudate nucleus (25.8%) and hippocampus (18.9%) after ingestion of 250mg/kg of the ethanolic leaf extract, although concentrations in the cerebral cortex remain unchanged.(67)

Serotonergic Neurotransmission

Serotonin concentrations in the rat brain following ingestion of 250mg/kg of the ethanolic leaf extract appear to be differentially effected, with a large (60.7%) increase in the cerebral cortex and a decrease (10.7%) in the caudate nucleus with no alterations in the hippocampus.(67)

Memory and Learning

In a mouse model of scopolamine induced amnesia before testing in a passive shock avoidance paradigm and elevated plus maze, a specific extract of Moringa oleifera (methanolic extract, but a Toluene-ethylacetate subfraction that was 0.26% yield) at 50-100mg/kg appears to exert protective effects of somewhat comparable potency as 100mg/kg Piracetam.(68)

Imp. Highlights

Possible minor nootropic effects associated with the leaf extracts.

There appears to be anti-amnesiac properties associated with Moringa oleifera leaf extracts.

The leaves and seeds of Moringa may protect against some of the effects of arsenic toxicity, which is especially important in light of news that common staple foods, such as rice, may be contaminated. Co-administration of M. oleifera seed powder (250 and 500 mg/kg, orally) with arsenic significantly increased the activities of SOD [superoxide dismutase], catalase, and GPx with elevation in reduced GSH level in tissues (liver, kidney, and brain).

Protective effects have been noted in hypoxia induced amnesia[69] as well as in colchine-induced Alzheimer's disease in rats.[70]

Alongside anti-amnesiac effects, a preservation of antioxidant biomarkers (higher SOD and Catalase, with less lipid peroxidation) has been noted in the cerebral cortex with 250mg/kg Moringa oleifera leaf extract and the decrease in serotonin, noradrenaline, and dopamine seen with cochine appears to be attenuated.[67] Both the antioxidant effects and the preservation of monoamines are thought to underlie the antiamnesiac properties.[71]

In mice given 250-2,000mg/kg of the leaf ethanolic extract, there appears to be increased learning and memory as assessed by Y-maze testing and in mice subject to a passive shock avoidance paradigm 50-100mg/kg of a methanolic extract subfraction (0.26% total leaf yield) was able to reduce the number of mistakes and latency.[68]

Anxiety and Stress

In mice given 250-2,000mg/kg of the ethanolic leaf extract, it appeared that supplementation was able to cause a reduction in anxiety in a hole board test and elevated plus maze.

Analgesia

In adult male rats with chemically induced arthritis, a methanolic extract of the leaves (300-400mg/kg, but not 200mg/kg) is able to reduce pain perception (assessed by thermal and mechanical testing) with potency comparable to 5mg/kg Indomethacin. Root extracts were similarly effective against thermal testing, but were ineffective against mechanical allodynia at all doses.

Interaction with Cardiovascular System

Absorption

A leaf extract of Moringa oleifera does not appear to inhibit intestinal lipase, suggesting no inhibition of dietary fat absorption.[72] A leaf extract appears to significantly inhibit cholesterol micelle formation (40% inhibition at 10mg/mL) and can directly bind to bile acids (no influence on pancreatic cholesterol esterase), suggesting an inhibitory effect on cholesterol absorption.[72]

Imp. Highlights

Limited evidence in human suggests that there may be a hypo-lipidemic effect of supplementation in diabetics.
It Inhibit cholesterol absorption from the intestines, but does not appear to be involved with fatty acids absorption inhibition.

"Zeatin is a plant hormone derived from the purine adenine. It is a member of the plant growth hormone family known as cytokinins. Zeatin was first discovered in immature corn kernels from the genus Zea. Zeatin and derivatives were discovered to be the primary active ingredient in coconut milk, which has long been known to actively induce plant growth. As in the case of kinetin, zeatin has also been reported to have several in vitro anti-aging effects on human skin Fibroblasts."

Cardiac Tissue

Isolated N,α-L-rhamnopyranosyl vincosamide (from the leaves) appears to reduce infarct size from isoproterenol in rats from 52% down to 20% when preloaded for seven days at the dose of 40mg/kg. [73]

Blood

10-100mg/kg of water extracts of Moringa oleifera (leafs and pods), but not methanolic extracts, appear to cause an increase in hemoglobin in mice following a single oral dose. [74]

Blood Pressure

When looking at the isothiocyanates and thiocarbamates of Moringa oleifera, it was noted that the molecules with a cyanide and sulfur group (RBITC, Niaziminins A-B) were able to reduce blood pressure at a dose of 3mg/kg by 35-40% in anesthetized rats. [75]

In a rat model of monocrotaline-induced pulmonary hypertension, injections of the leaf extract at 4.5mg/kg appear to cause a reduction in blood pressure associated with vasodilation and increased antioxidant potential. [76]

Lipids and Cholesterol

A review[77] notes a study which cannot be found online (Kumari 2010) suggesting that 8g of the leaf powder daily over the course of 40 days in type II diabetics is able to reduce total cholesterol (14%), LDL-C (29%), vLDL-C (15%), and triglycerides (14%) with a nonsignificant increase in HDL-C by 9%.

Interactions with glucose metabolism

Absorption

The leaf extract of Moringa oleifera appears to inhibit intestinal sucrase with an IC_{50} of 780+/-210µg/mL, with weak inhibitory potential against pancreatic amylase.[78]

Blood Glucose

200mg/kg of the water extract of the leaves appears to have hypoglycemic properties in otherwise normal rats, reducing fasting blood glucose by 26.7% over the course of eight hours after acute ingestion and reducing the spike in glucose from an oral glucose tolerance test by 29.9% relative to control.[79]

Imp. Highlights

Subsequent elegant and very thorough work, published in 1964 as a PhD thesis by Bennie Badgett (a student of the well known chemist Martin Ettlinger), identified a number of glycosylated derivatives of benzyl isothiocyanate (e.g. compounds containing the 6-carbon simple sugar, rhamnose).
The identity of these compounds was not available in the refereed scientific literature until "re-discovered" 15 years later by Kjaer and co-workers. Seminal reports on the antibiotic activity of the primary rhamnosyl ated compound then followed, from U Eilert and colleagues in Braunschweig, Germany. They reisolated and confirmed the identity of 4-(-L-rhamnopy-ranosyl benzyloxy) benzyl glucosinolate and its cognate isothiocy-anate and verified the activity of the latter compound against a wide range of bacteria and fungi.

This was slightly less hypoglycemic than the reference drug glipizide (2.5mg/kg).

Diabetes

200mg/kg of the water extract of the leaves (determined to be more effective than 100mg/kg or 300mg/kg), when fed to diabetic rats over the course of 21 days, there appear to be time dependent decreases in fasting blood glucose reaching up to a 69.2% drop and a reduction in an oral glucose tolerance test after 21 days by 51.2%. This was comparable or slightly greater than the reference drug glipizide (2.5mg/kg).[79]

10mg/kg of the leaf extract of Moringa oleifera acutely administrated to alloxan induced diabetic rats appears to be of comparable or greater potency than glibenclamide[80] and in dexamethasone induced insulin resistance, the alcoholic (125-250mg/kg) extract of the leaves appears to prevent insulin resistance from occurring in peripheral tissues although it had no effect on fasting glucose increased by dexamethasone.[81]

In type II diabetics given a 75g oral glucose tolerance test, oral ingestion of Moringa oleifera was able to reduce blood glucose by approximately 21% and this was not associated with an increase in serum insulin; the other two tested vegetables for example the Momordica charantia and Murrya koiengii, were ineffective.[82]

A review on Moringa oleifera[83] notes a study not available online (Kumari 2010) where supplementation of the leaf powder at eight grams daily noted reductions in fasting glucose (28%) and postprandial glucose (26%) relative to baseline over the course of 40 days, and a follow-up study in sixty type II diabetics supplemented with the leaf extract (dosage unspecified) over 90 days resulted in a decrease in HbA1c (0.4% points) and a time dependent decrease in post-prandial blood glucose by 9% (30 days), 17% (60 days), 29% (end of study).[84]

Interaction with Inflammation & Immunity

Macrophages

Isothiocyanates (such as Sulforaphane[85] or benzylisothiocyanate[86]) are known to possess anti-inflammatory properties and an isothiocyanate known as RBITC from Moringa oleifera, when incubated with the macrophages are stimulated

Imp. Highlights

Appears to suppress macrophage activation with a potency greater than sulforaphane and in the nanomolar range.

Appears to be somewhat protective against neutrophil related immunosuppression in rats with the leaf extracts.

There appears to be a reduction in post-meal glucose spikes seen with oral ingestion of Moringa oleifera which is not due to a stimulation of insulin secretion.

The seeds of Moringa oleifera appear to have anticholinergic and anti-inflammatory properties in the airway, suggesting anti-asthmatic properties.

with LPS, is able to inhibit nitrite production in a concentration dependent manner with an IC_{50} of 960+/-230nM; this was greater than its aglycone benzylisothiocyanate and sulforaphane, and it appeared that RBITC was able to suppress iNOS and COX-2 induction by preventing the degradation of IκBα (and thus hindering NF-kB signalling) and reducing phosphorylation of ERK1/2 and JNK although the two pathways seemed independent of each other. The inhibitory effects of RBITC were additive with the reference MEK1 inhibitor U0126.[87]

When looking at the plant extract overall though, concentrations of 31-250µg/mL are required (water extract of the pod) to suppress nitric oxide formation whereas 62µg/mL or above are required for the suppression of iNOS and COX-2 induction as well as TNF-α and IL-6 secretion. [88]

Neutrophils

In a model of cyclophosphamide-induced immunosuppression (neutropenia or a loss of neutrophil function[89]), 250-750mg per kg of the methanolic leaf extract appears to attenuate the degree of immunosuppression and preserve neutrophil phagocytosis.[90] This is also seen with more reasonable (150-500mg/kg) of a 50% ethanolic extract.[91]

B Cells

One study using the methanolic extract of the leaves at 250-750mg/kg in mice has noted an increase in circulating antibody titre and immunoglobulins.[90]

Arthritis

In a carrageenin model of edema where rats were orally supplemented with 750-1,000mg/kg of a root water extract 30 minutes prior to carrageenin injections, the lower dose was able to suppress edema when measured at one hour (53.5%), three hours (44.6%), and five hours (51.1%) while the higher dose was not more effective and 750mg/kg being somewhat comparable to Indomethacin (10mg/kg).[92]

Bacterial Interactions

When looking at extracts from Moringa oleifera leaves (hot and cold water extract, a juice, and an ethanolic extraction) it was noted that the juice had a minimum inhibitory concentration (MIC) in the range of 229-458µg/mL against a variety of

Imp. Highlights

The Moringa oleifera appears to have hypoglycemic properties in rats who do not have diabetes nor insulin resistance, and this appears to be a relatively large drop in blood glucose following acute oral ingestion.

Potential inhibitory effects on sucrose absorption, although no apparent inhibition of starch absorption

In animal research the Moringa oleifera appears to have anti-diabetic properties due to a currently unknown mechanism (although usually said to be due to its antioxidant properties; but unconfirmed).

The potency, based on the preliminary and limited evidence, is comparable to reference drugs

bacteria; this was slightly more potent than the ethanolic extract (458-916µg/mL) and water extracts (29.87-58.75mg/mL).[93]

Moringa oleifera can be used to create high activated carbons[94][95] which are able to sequester and remove cyanobacterial microcystin-LR quite effectively,[92] and the seed extract also appears to be capable of suppressing cyanobacterial growth as 20-160mg of Moringa oleifera extract per liter of water is able to suppress growth of Microcystis aeruginosa and cause the colony count to decline.[96]

Virology

Moringa oleifera (80% hydroalcoholic extract) appears to have antiviral potential against hepatitis B (HBV) in vitro with a potency lesser than that of Turmeric, Momordica charantia, and Cratoxylum formosum although 30µg/mL still appeared to reduce HBV cccDNA by more than 85%.[97]

Interactions with oxidation

In vitro

The leaves appear to be the most potent antioxidant part of the plant, with a methanolic extract sequestering free radicals with an EC_{50} value of 200-387µg/mL[98] and in a DPPH assay the IC_{50} value for inhibition with the stem bark are most potent with the methanolic extract (54.34µg/mL) and lesser with petroleum (124.75µg/mL) and chloroform (112.08µg/mL) extracts.[99]

This antioxidant property is not correlated with the phenolic content of the plant and is thought to be mostly due to the Vitamin C content; even when the phenolics reach high levels (using a flower extract which is 8.69% phenolics by weight) the scavenging potential is less than Vitamin C[100] as vitamin C itself has shown a sequestering potential of 13.68µg/mL (IC_{50} for DPPH assay) which exceeds that of all Moringa oleifera extracts.

Components in the stem bark appear to be able to scavenge nitric oxide radicals, with IC_{50} values of 93.32µg/mL (Petroleum ether extract), 65.12µg/mL (chloroform extract), and 54.83µg/mL (the ethyl acetate soluble fraction of methanolic extracts) all of which underperform relative to vitamin C (12.59µg/mL).[101]

Imp. Highlights

May have acute anti-inflammatory and antiedemic properties when water extracts are orally ingested When cultured in the same water as cyanobacteria mori nga oleifera appears to be capable of reducing microcystin contamination at moderate concentr-ations.

Currently unknown components in the leaves appear to possess somewhat respectable anti-bacterial properties Appears to be a respectable antioxidant in vitro when scaven-ging free radicals, but fails to outperform Vitamin C and is less potent than many other medicinal her-bs. The Moringa ole-ifera leaves may have a suppressive effect on the conver-sion of T4 into active T3.

In vivo

200mg/kg of the leaf water extract to rats over 21 days has failed to increase antioxidant enzymes (SOD, Catalase, Glutathione peroxidase) in normal rats, but was able to effectively normalize levels of these enzymes in diabetic rats;[102] as diabetics tend to have lower antioxidant defenses leading to comorbidities.[103][104]

Interactions with the Hormones

Thyroid Hormones

Ten days supplementation of 175-350mg/kg of the leaf extract in rats, female rats appeared to experience a decrease in circulating T_3 (by around 30%) with an increase in T_4 (15%) while male rats did not experience any changes at either dosage.[105]

Interactions with the Organ Systems

Eyes

In diabetic rats, Moringa oleifera appears to be able to prevent the oxidative and inflammatory sequelae of diabetic retinopathy from occurring when supplemented over 24 weeks.[106]

Lungs

The seeds of Moringa oleifera are said to have beneficial effects in children with upper respiratory tract infections, which is thought to be in part due to a reported antipyretic effect and in part due to direct benefit to lung function.[107] It has been reported to act similar to ephedrine (which relaxes the bronchiol tubes) due to the alkaloid Moringine having a structural similarity.[108]

Mechanistically, the seeds have been noted to have anti-histamine properties by attenuating its release in response to an antigen and 400mg/kg (ethanolic extract) is able to reduce bronchospasms from acetylcholine with potency comparable to 1mg/kg ketotifen.[109][110]

In persons with bronchiol asthma (not specifically allergic asthma), a pilot study using Moringa oleifera seeds at 3g (twice daily) for three weeks was associated with significant reductions in the symptoms of dyspnea, wheezing, coughing, and chest tightness to less than half of baseline.[111]

Imp. Highlights

Preliminary human evidence suggests an improvement in breathing and lung function associated with ingestion of the seeds

Moringa oleifera appears to signal through the 5-HT_3 receptors in the stomach to exert protective effects in ulceration models against aspirin.

The antioxidant effects of the leaf extracts appear to also occur in the kidney, where they may protect against oxidative toxins

The antioxidant properties (currently thought to be them at least) appear to underlie a reduction in urinary proteins and glucose in diabetic animals, suggesting protective effects that may attenuate the rate of kidney failure in diabetes.

Stomach

Serotonin is secreted in the stomach from enterochromaffin cells (EC cells) where it is involved in secretion of mucus; Moringa oleifera (leaf water extract) can preserve the amount of these cells and their serotonin content in models of ulceration and 300mg/kg of this extract for 14 days prior to ulceration (deemed the most effective dose) works in a manner that is blocked by 5-HT_3 receptor antagonists.[112]

An ethanolic extract of the root bark at 150-500mg/kg is able to reduce ulcer formation induced by plyoris-ligation by 82.58-86.15% (minimal dose-dependence) and from Alcohol induced ulcer formation by 55.75-78.51%; the reference drug, omeprazole at 30mg/kg, was more effective. Similar protective effects against ulcers (usually from ethanol or aspirin) have been noted with an ethanolic extract of the leaves in the range of 200-500mg/kg although the fruits appear ineffective.[113]

Intestines

In vitro, the seeds of Moringa oleifera appear to inhibit acetylcholine induced intestinal contractions with an EC_{50} of 65.6mg/mL which is indicative of weak antispasmolytic effects.[114]

In mice fed with the roots of Moringa oleifera (100-200mg/kg of the ethanolic extract) for a week preceding induction of experimental colitis, supplementation appears to be equally or slightly less protective than the reference drug of 5mg/kg prednisone (IP injection) while 50mg/kg of Moringa oleifera was paired with 50mg/kg of the rind of Citrus sinensis (the common orange) exerted synergistic protection exceeding prednisone on hyperemia and ulceration. Protective effects have been seen elsewhere with the leaf hydroalcoholic extract (50-200mg/kg) and chloroform extracts (100-200mg/kg) by reducing inflammation and and ulceration in the distal colon from acetic-acid.[115]

Kidneys

In mice subject to DMBA-induced kidney who received 200-400mg/kg of a hydroalcoholic extract of Moringa oleifera (pods) for two weeks prior to DMBA, supplementation was able to dose-dependently reduce changes in oxidative status (with the higher dose normalizing GST and glutathione transferase) and fully normalized changes in renal enzymes as

Imp. Highlights

Appears to have some diuretic properties.

There are hundreds of scientific publications worldwide that describe specifically the antibiotic activity of herbal products against H. pylori. A search in the PubMed database from 1991 to August 31, 2013, lists over 300 entries, including plant extracts, plant compounds, and plant processed products. In 1991, the anti-H. pylori effect of 13 Malagasy medicinal plants was reported. Since then, several investigations of medicinal plants of a specific region or country have been undertaken. Examples include studies of the anti-H. pylori activity of Chinese, Mexican, Iranian, Taiwanese, African and Greek herbal medicines. The largest group of reports refers to the activity of an individual plant, either for medicinal or dietary use.

(AST, ALP, ALT). The protective effect of Moringa oleifera was greater than 0.5-1% Butylated hydroxyanisole (BHA; antioxidant). Elsewhere, Moringa oleifera appears to be protective against gentamicin-induced nephrotoxicity with 150-300mg/kg of the aqueous-ethanolic extract of the leaves. When measuring urinary proteins and sugars in a rat model of diabetes, Moringa oleifera appears to abolish all urinary proteins and sugars with 14 days of treatment with 200mg/kg of the water extract of the leaves. Oral ingestion of 1,000mg/kg of Moringa oleifera leaves to rats appears to possess diuretic potential.[116]

Liver

In response to DMBA induced carcinogenesis, 14 days pretreatment with 200-400mg/kg of a pod extract appear to normalize glutathione transferase and GSH levels in the liver as well as liver enzymes with a potency exceeding 0.5-1% BHA. Antioxidant-mediated protection has also been noted against anti-tubercular drug induced toxicity (causing hepatic lipid peroxidation) and against acetominophen toxicity. The seed oil also appears to be somewhat hepatoprotective (again attributed to antioxidants) as is seen in a model of hepatitis in rats and one study has noted hepatoprotective effects against a high fat diet where the leaf extract (150mg/kg) as the early phases of liver damage from a high fat diet involves increased β-oxidation of fatty acids (in response to high dietary intake) causing lipid peroxidation.[117][118]

In particular against acetominophen toxicity (which causes a production of NAPQI causing glutathione depletion and oxidative stress) Moringa oleifera (both flower and leaf extracts) appears to work via preserving glutathione with 200-400mg/kg hydroalcoholic extracts (injection) having comparable potency to 7.35mM injections of N-acetylcysteine. 300mg/kg of the leaf extract of Moringa oleifera appears to reduce the ability of ionizing radition to cause lipid peroxidation in the liver when preloaded for 15 days, fully preventing the increase in lipid peroxidation.[119][120]

Testicles

In a study assessing the possible toxicity of Moringa oleifera (leaf water extract), it was noted that despite no abnormalities on testicular structure (assessed via histology) there was a transient decrease in sperm count at 250mg/kg oral int-

Imp. Highlights

This is clearly the area in which the preponderance of evidence - both classical scientific and extensive anecdotal evidence - is overwhelming. The scientific evidence has now been available for over 50 years, although much of it is completely unknown to western scientists. H. pylori is an omnipresent pathogen of human beings in medically underserved areas of the world, and amongst the poorest of poor populations worldwide. It is a major cause of gastritis, and of gastric and duodenal ulcers, and it is a major risk factor for gastric cancer (having been classified as a carcinogen by the W.H.O. in 1993). Cultures of H. pylori, it turned out, were extraordinarily susceptible too, and to a number of other isothiocyanates. These compounds had antibiotic activity against H. pylori at concentrations up to 1000-fold lower than those which had been used in earlier studies against a wide range of bacteria and fungi. The extension of this nding to human H. pylori infection is now being pursued in the clinic, and the prototypical isothiocyanate has already demonstrated some efficacy in pilot studies. (Jed W. Fahey, 2005)

ake over 60 days; this was not observed at higher doses of 500-1,000mg/kg and both morphology and motility of sperm was unaffected.[121]

Interactions with Cancer Metabolism

Melanoma

Moringa oleifera appears to be able to induce p53, p27Kip1, and p21WAF1/Cip1 protein levels in B16F10 melanoma cells, leading to reduced proliferation.[122]

Cervical Cancer

In isolated KB Cells (subtype of HeLa) the leaf extract of Moringa oleifera appears to reduce proliferation and viability of these cells in the range of 100-200µg/mL, which underperformed relative to 10µg/mL cisplatin; this was associated with DNA fragmentation being induced from prooxidative effects.[121]

Pancreatic Cancer

A hot water extract of the leaves at 100-2,000µg/mL appears to reduce survival of pancreatic cancer cells in vitro, and in particular against Panc-1 cells (IC_{50} of 1.1mg/mL), COLO 357 (IC_{50} of 1.8mg/mL), and p34 cells (IC_{50} of 1.5mg/mL).

This reduction in survival appears to be associated with a downregulation of NF-kB signalling and a downregulation of p65, phospho-IκBα and IκBα.

NF-kB is known to protect pancreatic cancer cells from death and its suppression sensitized these cells to death from the chemotherapeutic cisplatin.[123]

Colon Cancer

In a rat model of chemical induced colon carcinogenesis, oral ingestion of the pods of Moringa oleifera at 1.5-6% of the rat diet for two weeks prior to toxicity (and continued throughout the study period) resulted in a dose-dependent reduction in colon tumors by 47% (1.5% of the diet), 53% (3% of the diet), and 71% (6% of the diet).

These suppressive actions are thought to be related to antiinflammatory actions, as iNOS and COX2 expression were dose-dependently reduced.[124]

Imp. Highlights

There is a known LD_{50} value with injections of the water extracts which is fairly low (relative to supplemental dosages).
May have some benefits to the smooth appearance of the skin related to a higher water content of the skin.
Topical application of the leaves of Moringa oleifera may possess wound healing properties of unknown potency, which is currently thought to be related to the anticoagulant properties of the leaf extracts.
Appears to have anti-cancer properties in vitro against pancreatic cancer, but this occurs at a relatively high concentration and may not be optimal following oral ingestion of the supplement.

Interactions with Pregnancy

Lactation

In women during postpartum days 3-5 (after giving birth to preterm infants), supplementation of 250mg Moringa oleifera leaf extract twice daily appears to increase milk production in a time dependent manner on the first day of supplementation (31% increase over placebo) as well as the second (48%) and third (165%) day.[125]

Contraception

Moringa oleifera appears to be traditionally used as an aborifacient to abort pregnancies in the early stages, and oral ingestion of 175mg/kg of the leaves to pregnant rats for 5-10 days was able to induce abortions in all drug-treated rats.[126]

Interactions with Aesthetics

Skin

Topical application of an ethylacetate extract of the seeds appears to have wound healing properties (10% of solution when applied to rats) which is thought to be related to the ability of Moringa oleifera to have protease-like activity (due to components in the leaves and roots, albeit more in the leaves) as well as have fibrinogenolytic and fibrinolytic activity. Fibrinogenolysis is known to accelerate wound healing as an endogenous protease that Moringa oleifera mimicks, plasmin, cleaves fibrin into fibrin degradation products which inhibit excessive clotting and a hemostatic plug.[127]

The leaves of Moringa oleifera at 3% in a facial cream applied to the cheeks twice daily for three winter months appeared to have general smoothness enhancing properties (more color consistency and less fine wrinkling) associated with a higher hydration status of the skin.[128]

Nutrient-Nutrient Interactions

Citrus Sinensis

Citrus sinensis is the botanical term for the common fruit known as an orange; the peel (rind) of an orange is at times considered slightly medicinal. Combining 50mg/kg of the orange rind with 50mg/kg of the root extract from the Moringa

Imp. Highlights

When looking at toxicology data, it appears that the standard recommended doses are free from all organ damage and toxicity.

Higher doses (around 3-4 times the highest recommended supplemental dose) appear to be associated with genotoxic damage and even higher doses still cause apparent organ damage.

It would be prudent to avoid any supplementation of this plant beyond the recommended dosages to avoid potential genotoxicity.

Appears to be a galactogogue.

Appears to have quite potent anti-fertility actions in pregnant rats, and may be able to induce abortions.

oleifera appears to be synergistic in suppressing colitis in mice (when preloaded prior to the colitic toxin) and the combination, but neither plant in isolation, appears to be comparable or exceed the potency of 5mg/kg prednisone.[129]

Safety and Toxicology

General

The water extracts of Moringa seeds, when injected into mice, have been noted to possess an acute LD_{50} of 446.5mg/kg and injections of the leaf water extracts have noted an LD_{50} of 1,585mg/kg in mice.[130]

A water extract has failed to cause toxicity when orally administered up to this dose over 60 days although one study using the water extract at 3,000mg/kg daily noted genotoxic potential in PMBC immune cells (1,000mg/kg confirmed safe) despite no damage to organs. A leaf ethanolic extract has failed to exert any clinical signs of toxicity up to 6,400mg/kg acutely and a 50% ethanolic extract appears to be clinically nontoxic up to 2,000mg/kg. A methanolic extract of the leaves has found an increase in liver enzymes at 200-400mg/kg.[131]

A water extract of the seeds, when fed orally to rats at 5.2mg/mL drinking water, failed to exert toxic effects over the course of 30 days. A seed methanolic extract is not acutely toxic up to 3,000mg/kg in rats (although 5,000mg/kg was damaging) and an LD_{50} of 3,873mg/kg was noted; chronic ingestion noted no toxicity aside from elevated liver enzymes associated with 1,600mg/kg oral intake (400-800mg/kg confirmed safe). The genotoxicity seen with high doses of the leaf supplements has also been replicated with higher than normal levels of the seed oil.[132]

The ethanolic extract of the root-bark appears to be safe acutely up to 2,000mg/kg in rats.[133]

Alternative therapies have proved to be useful in maintaining low bacterial levels, controlling inflammation, modulating the immune response, inhibiting adherence to the gastric epithelium, and neutralising some of the bacterial virulence factors such as the urease enzyme and the vacuolating toxin. Based on these results, the inclusion of natural products in the diet of asymptomatic patients could reduce the risk, as well as the development, of an unfavourable outcome of the infection

Imp. Highlights

Moringa is jammed with a cytokinin called zeatin. Cytokinins are plant hormones that help cells divide and protect against oxidation. Zeatin is the most powerful of all cytokinins. According to a 2004 Danish study, zeatin helps promote small cell size, a key component to more youthful skin. It also influences the structural and functional integrity of the cell, and prevents accumulation of macromolecular damage in the cell.

The study found that zeatin increases the activity of some antioxidant enzymes, counteracting the free radical-induced oxidative damage incurred during cell aging.

So which plant has more zeatin than any other? Moringa not only contains thousands of times more zeatin than any other known plant, it is also the most nutritious plant discovered to date, with over 90 nutritional compounds including 46 antioxidants and 36 anti-inflammatories.

How Moringa Interacts With H. Pylori

Moringa's use as an antibiotic in traditional medicine dates back thousands of years, while scientific evidence of it has been in existence since the late 1940's. These studies were conducted largely in the orient, which is why Western medicine and the pharmaceutical industry have largely remained ignorant of it. Indian scientists have identified Pterygospermin as the active compound in moringa that causes its antibacterial action. Pterygospermin, once consumed, breaks down into two separate benzyl isothiocyanate, a substance with known antimicrobial properties. Studies have shown that moringa leaf juice can be particularly effective against the Pseudononas aeruginosa bacterium, which can cause diseases in both animals and humans. This bacterium usually infects people with damaged exposed tissues or a weakened immune system, oftentimes manifesting itself through inflammation. In severe cases, the bacteria can take hold in the major organs such as the lungs, kidneys, or the urinary tract, with potentially fatal consequences. Staphylococcus aureus, a bacterium more commonly known as the cause of staph infections, which usually manifest as a skin infection. It was found that Moringa was just as effective as the commercial antibiotic Neomycin in getting rid of the infection.

However, what makes Moringa and the benzyl isothiocyanate it contains stand out from the rest is its ability to provide a special level of protection against the Helicobacter pylori, or H. pylori strain of bacteria. This bacterium can make its home in different parts of the stomach, causing local inflammation that can gradually flare up into full scale gastric or duodenal ulcers. If left untreated for long enough, an infection of H. pylori could eventually lead to the development of stomach cancer. Moringa not only gets rid of the bacteria, but in the case of ulcers, it can actually help jumpstart the healing process, effectively taking the role of at least 2 different medications.

Moringa powder is an all natural food item packed with vitamins, minerals, and nutrition, and as such, has no known negative side effects or drug interactions. This makes it completely safe to use and consume for people of all ages, regardless of any underlying medical conditions or medications they are taking. Moringa leaf juice made from moringa powder is the best way to take or apply it for best effect. Moringa juice can be drunk directly in the case of internal infections, or it can be applied directly on the infected area if it is on the skin.

Imp. Highlights

There is an inverse relationship between the low rates of H. pylori eradication and the appearance of side effects associated with the current therapies. The most common adverse effects observed in patients treated for H. pylori eradication include abdominal discomfort, diarrhea, nausea, vomiting, headache and weakness; furthermore, these symptoms have an impact on treatment compliance. The inclusion of alternative treatments in the anti-H. pylori scheme would enhance both the effectiveness of the therapy and the resolution of the pathology. Moreover, eradication rates would increase, and the development of bacterial resistance could be avoided.

In conclusion I would say most of the findings have demonstrated that some agents in plants exhibit good anti-inflammatory, immunomodulatory and gastro-protective activities, which as a whole favor the resolution of gastric damage despite the fact that H. pylori is not completely eliminated. Therefore, those agents can be used as adjuvants of allopathic anti-H. pylori eradication therapy.

Part Three

Philosophy of Healing

Philosophy of Healing & H. Pylori disease

Man has always been enduring to gain knowledge. We can gain knowledge through science or philosophy centered upon science. Science gives knowledge of observations but Philosophy is necessary to make helpful generalizations and to elucidate the phenomenon, which defy direct observations. Some time science cannot justify the philosophy, that's why majority of the people deny the philosophy but a wise know that science is not yet reached at that point where it can explain the most important philosophies of the time like existence of soul in human body and life after death. From the ages wise people are practicing the philosophy to heal themselves and to remain healthy. The Philosophy of Healing in east is known as Principles of Eastern Medicine/Hikma. So there are heaps of principles but most important are the one that deals with the intake of food, according to our inherit temperament or the acquired diseases. The main aim of this principle is to remain balanced inside out. The Prophet's advice to Sayyidina Ali (RH) to not to take dates and to eat barley in its place, when he was ill, is indicative of this principle.

It is related in Ibn Mājah's Sunan and elsewhere, from Umm al-Mundhir bint al-Qays al-Anṣāriyyah: "The Messenger of ALLAH (SW) came into my room accompanied by Sayyidina Ali (RA), who was then convalescing from conjunctivitis, a condition resulting from excess heat. In the room we had some dates (produces a heating effect) clusters hanging. The Messenger of ALLAH (SW) got up to eat some of them, and so did Sayyidina Ali (RH) The Messenger of ALLAH (SW) said to Sayyidina Ali (RH) 'You are convalescing'. Then she continued: I made some barley and chard, (which has a cooling effect) and brought it; and the Prophet g said to Sayyidina Ali (RH): 'Take some of this, for it is more beneficial for you".

The guidance of the Prophet to Sayyidina Ali (RH) reflects the principle that lost health may be restored through maintaining homeostasis by repelling the illness through its opposite and precautionary measures. It is interesting to note that many of the recommendations on diet are aimed at the balancing of qualities associated with foods: "...Hot food should be balanced with cold, sweet (increasing moistness) with sour and acid (increases dryness) with fat (increases heat)" Al-Jawziyyah.
Another principal is about changing our life style for wellbeing. For example on avoiding sleeping on your stomach, Yaʿīsh ibn Tighfat Gafari narrates from his father, who mentioned: "I was reclining in the mosque on my stomach (due to chest pains), suddenly a person nudged me with his feet and said, 'To lie down like this is disliked by Allah (SW)' When I turned to see who it was, I saw the Messenger of Allah".... As with all lifestyle factors the aspect of qualities associated with emotions and elimination also applies, as is indicated in the column of Highlights. **In the patients of H. Pylori the control of emotions especially anger is very import-ant because anger also produce same tempera-mental affects as the diseases itself (Hot & Dry). "Anger heats up the body and dries it up" (As-Suyuti)**

Imp. Highlights

During the H. Pylori infection the role of elimination is also very important. Ṭibb al-Nabawi attaches great importance to the effective removal of body waste. If the body is unable to remove waste products efficiently, it may become susceptible to diseases.

"When food increases beyond the extent of dissolution... these turn into harmful substances.. and bring about various types of illnesses accor-ding to various types of harmful substances and the susceptibility of organs and body" (Al-Jawziyah)
Of special significance as far as elimination is concerned is Ṭibb al-Nabawī emphasis of elimination from the colon. This has been highly-lighted in a narra-tion of a ḥadīth by Abdu-llāh ibn Umm-Huzam: Use Senna. it cures every disease... except death" Senna is a well-known laxative of all humours except Dum and used for many centuries to facil-itate effective elimin-ation from the colon.

Principles of Eastern Medicine & H. Pylori

In this section I have tried to give some philosophical explanations of most common disorders related to H. Pylori infection. I concluded that 5 disorders are most common in case of H. pylori infection. So I figured out important foods and life style guidance for patients who are distress by one of these disorders.

(1) Peptic Ulcer Disease (PUD)

Peptic ulcers are open sores that develop on the inside lining of the lower esophagus, stomach and the upper part of the small intestine (duodenum). **PUD** could occur in the esophagus, in the stomach or in the upper part of the small intestine.

Signs and Symptoms: An intense, burning and gnawing pain in the stomach and abdominal region; usually worse when hungry; the pain may be relieved for a while by certain foods; the pain is sometimes worse after eating; pain flare-ups commonly occur at night.

Complications

- **Internal Bleeding:** This may result in anemia if not treated in time.
- **Infection:** Peptic ulcers may perforate the inside lining of the stomach or small intestine, so increasing the risk of infections such as peritonitis.
- **Scar Tissue:** Peptic ulcers may produce scar tissue, which blocks the passage of food along the digestive tract.

What Causes PUD? The condition develops when the production of protective mucous by the stomach lining is reduced, or the production of stomach acids is increased excessively, or both. Peptic ulcers occur when acid in the digestive tract eats away at the inner surface of the esophagus, stomach or small intestine. The overuse of certain medications, like non-steroidal anti- inflammatory drugs & corticosteroids, or high-dose Vitamin C, may cause peptic ulcers.

View of the Tibb

According to Tibb, peptic ulcers are linked to the qualities of heat with dryness. The result is often burning gastric or abdominal pain. If a person's lifestyle promotes abnormal build-up of the qualities of heat and dryness, the risk of developing peptic ulcers increases markedly. Often responsible are consuming heavily spiced foods and alcoholic drinks excessively, and failing to manage stress appropriately. The excessive heat also makes the person more susceptible to inflammation caused by H. pylori bacteria.

People with a dominant or sub-dominant bilious temperament are most likely to develop peptic ulcers due to their inherent qualities of heat and dryness.

Tibb Guidance for and Lifestyle Factors

- Eat **mostly Cold & Moist foods** - such as rice, cucumber, watermelon and milk, **followed by Cold & Dry foods** - like yogurt, potato, apples and coconut oil.
- Eat **less of Hot & Moist foods** - such as mutton, ginger, spinach and sugar, and the **least amount of Hot & Dry foods** - like chicken, eggs, garlic and onions.
- Eat frequent small meals, consisting in part of well-cooked white rice, yogurt and cottage cheese.
- Eat more vegetables and fruit such as carrots, broccoli and sweet apples.
- Allow hot beverages, like rooibos tea, to cool down before drinking, to avoid triggering gastric discomfort.
- Avoid fried foods, tea, coffee, alcohol, chocolate, strong spices, animal fats, and carbonated drinks.
- Practice slow and deep breathing exercises twice daily.
- Drink plenty of water. A glass of water drunk rapidly often relieves gastric pain. The water dilutes stomach acid, flushing it into the duodenum where it is neutralized.
- Avoid non-steroidal anti-inflammatory drugs, especially aspirin.
- Consider quitting smoking, as nicotine irritates the stomach lining.
- Keep the colon clean by selecting a high fiber diet. The use of a gentle and natural laxative is recommended monthly.

(2) Heartburn

Heartburn is a burning sensation just behind the breastbone. It is often worse when lying down. This burning sensation usually occurs after eating; it is usually worse at night; it may be accompanied by a sour or bitter taste in the mouth or the sensation of food being stuck at the back of the throat. Heartburn is caused by stomach acid moving back up into the esophagus. When we eat, the muscle above the stomach relaxes to allow food in and then closes again. With heartburn, the muscle relaxes abnormally or is weakened, and this allows stomach acid back up into the esophagus.

Tibb Management

Management is aimed at reducing the excess heat with dryness associated with peptic ulcers, by implementting Tibb Lifestyle Factors that will increase the qualities of coldness and moistness. This assists Physis in addressing both the symptoms and the causes of peptic ulcers.

The Tibb View of Heartburn

According to Tibb philosophy, heartburn either results from an excess of heat with dryness, caused by increase production of stomach acid; or it results from an excess of moistness, which causes the muscle to relax abnormally. Heartburn linked to heat with dryness is more prevalent in people with dominant bilious temperament but moistness is more common in the phlegmatic and the sanguineous people.

Tibb Lifestyle Factors

- Eat **mostly Cold & Moist foods** - such as rice, cucumber, watermelon and milk, **followed by Cold & Dry foods** - like yogurt, potato, citrus fruit and coconut oil.
- Eat **less of Hot and Moist foods** - such as mutton, ginger, spinach and sugar, and the **least amount of Hot and Dry foods** - like chicken, eggs, garlic and onions.
- Drink a large glass of water rapidly for pain relief. This dilutes the stomach acid, flushing it into the duodenum, where it is neutralized.
- Eat frequent small meals, including well-cooked white rice, yogurt and cottage cheese.
- Eat vegetables such as carrots and broccoli occasionally.
- Allow hot beverages, like rooibos tea, to cool before drinking, to avoid triggering gastric discomfort.
- Avoid fried foods, tea, coffee, alcohol, chocolate, strong spices, animal fats, and carbonated drinks.
- Avoid eating and drinking at the same time. Take in fluids 30 minutes before or after a meal.
- Avoid lying down immediately after a meal.
- Lose weight if overweight.
- Wear loose, comfortable clothing.
- Avoid non-steroidal anti-inflammatory drugs (aspirin).
- Quit smoking.
- Practice slow and deep breathing exercises twice daily.
- Keep the colon clean by adopting a high-fiber diet. The use of a gentle and natural laxative is recommended monthly.
- Drink a glass of chilled milk to reduce discomfort caused by stomach acid.

(3) Gastritis

Gastritis is a group of symptoms that arise from inflammation of the stomach lining. A gnawing or burning ache or pain in the upper abdomen; it may become better or worse with eating; nausea; vomiting; a feeling of fullness in the upper abdomen after eating.

Tibb Management

In Heart burn Management is aimed at reducing the excess qualities associated with heartburn by implementing Tibb Lifestyle Factors that will increase the qualities of coldness and moistness in cases of heartburn linked to excess heat with dryness; or increase dryness in cases of heartburn linked to excess moistness. This assists Physis in addressing both the symptoms & causes of heartburn.

The Tibb View of Gastritis

According to Tibb, gastritis is linked to qualities of heat with dryness. These lead to the burning abdominal pain experienced. A lifestyle that promotes this heat and dryness, increases the risk of developing gastritis. People with a bilious temperament are most likely to develop this.

Tibb Lifestyle Factors

- Eat **mostly Cold & Moist foods** - such as rice, cucumber, watermelon and milk, **followed by Cold & Dry foods** - like yogurt, potato, citrus fruit and coconut oil.
- Eat **less of Hot & Moist foods** - such as mutton, ginger, spinach and sugar, and the **least amount of Hot & Dry foods** - like chicken, eggs, garlic and onions.
- Drink a large glass of water rapidly to relieve pain. This dilutes excess stomach acid, flushing it into the duodenum, where it is neutralized.
- Eat frequent small meals, including well-cooked white rice, yogurt and cottage cheese.
- Eat vegetables such as carrots and broccoli occasionally.
- Allow hot beverages, such as rooibos tea, to cool before drinking. This avoids triggering gastric discomfort.
- Avoid fried foods, tea, coffee, alcohol, chocolate, strong spices, animal fats and carbonated drinks.
- Practice slow and deep breathing exercises twice daily.
- Keep the colon clean by consuming a high-fiber diet. The use of a gentle and natural laxative monthly is recommended.

(4) Gastro Esophageal Reflux Disease

GERD is a chronic disease where stomach acid occasionally flows back into the esophagus. The acid irritates the lining of the esophagus and causes the signs and symptoms of GERD.

A burning sensation behind the breastbone; a sour taste in the mouth; regurgitation of food or acid/bile; chest pain; difficulty swallowing; dry cough; and a sensation of a lump in the throat.

GERD results from frequent episodes of heartburn or acid reflux, due to stomach acid moving into the esophagus. During digestion, the muscles above the stomach relax to allow food in and then closes again.

With GERD, the frequent muscle relaxation allows stomach acid back up into the esophagus, causing heartburn.

Tibb Management

In gastritis the Management is aimed at reducing the excess heat with dryness associated with gastritis, by implem-enting Tibb Lifestyle Factors that increase the qualities of coldness & moistness. This assists Physis in addressing both the symptoms and causes of gastritis.

The Tibb View on (GERD)

According to Tibb philosophy, GERD can either result from an excess of heat with dryness which produces an excess amount of stomach acid, or from an excess of moistness, which causes the muscle to relax abnormally.

GERD linked to heat with dryness common in people with bilious temperament but moistness is more common in phlegmatic & sanguineous people.

Tibb Lifestyle Factors

- Eat **mostly Cold & Moist foods** - such as rice, cucumber, watermelon and milk, **followed by Cold & Dry foods** - like yogurt, potato, citrus fruit and coconut oil.
- Eat **less of Hot & Moist foods** - such as mutton, ginger, spinach and sugar, and the **least amount of Hot & Dry foods** - like chicken, eggs, garlic and onions.
- Drink a large glass of water rapidly to relieve pain. This dilutes excess stomach acid, flushing it into the duodenum where it is neutralized.
- Eat frequent small meals, including well-cooked white rice, yogurt and cottage cheese.
- Occasionally eat vegetables such as carrots and broccoli.
- Allow hot beverages, like rooibos tea, to cool before drinking, to avoid triggering gastric discomfort.
- Avoid fried foods, tea, coffee, alcohol, chocolate, strong spices, animal fats, and carbonated drinks.
- Avoid eating and drinking at the same time. Fluids should be taken 30 minutes before or after a meal.
- **Other Lifestyle Advice**
- Avoid lying down immediately after a meal.
- Deep breathing exercises twice daily.
- Keep the colon clean by following a high-fibre diet. The use of a gentle and natural laxative is recommended monthly.
- Drink a glass of chilled milk to reduce discomfort caused by stomach acid.

(5) Indigestion

Indigestion, also known as dyspepsia, describes an upset stomach characterized by discomfort in the upper abdomen. Most common symptoms are abdominal pain; feeling bloated; intestinal gas build-up; rumbling noise in the abdomen; belching; nausea (sometimes retching or vomiting); abdominal discomfort and fullness after eating; and a burning sensation in the upper abdomen. Indigestion is often caused by unhealthy lifestyle behavior, which includes overeating; eating hastily; eating spicy, greasy & dyspepsia by H. Pylori.

Tibb Management

Management is aimed at reducing the excess qualities associated with GERD, by implementing Tibb Lifestyle Factors that will increase the qualities of coldness with moistness in patients with symptoms of excess heat with dryness and by increasing the quality of dryness in patients with symptoms of excess moistness. This assists Physis in addressing both the symptoms and causes of GERD.

Management of Indigestion

Management of indigestion is aimed at reducing the qualities associated with the person's temperament, by implementing a lifestyle, especially diet that is best suited for the different temperaments. This assists Physis in addressing both the symptoms and the causes of indigestion.

Tibb Lifestyle Factors for Four Temperaments if indigestion

Below is the guidance for people of 4 dominant temperaments.

Phlegmatic temperament

Eat **mostly Hot & Dry foods** - such as garlic, onion, fenugreek and mustard, **followed by Hot & Moist foods**- like mutton, ginger, turmeric and black pepper, and **Cold & Dry foods**- such as citrus fruit, basil, yogurt and mealie meal and the **least amount of Cold & Moist foods** - like milk, rice, cucumber and watermelon.

Sanguinous Temperament

Eat **mostly Cold & Dry foods** - such as yohgurt, citrus fruit, beef and basil f**ollowed by Cold & Moist foods** - like coriander, rice, beetroot and broccoli, and **Hot & Dry foods**- such as garlic, onion, chicken and eggs, and the **least amount of Hot & Moist foods** - like white flour products, sugar, cheese and bananas.

Melancholic Temperament

Eat **mostly Hot & Moist foods** - such as ginger, olive oil, turmeric and honey, **followed by Hot & Dry foods**- like garlic, onion, chicken and eggs, and **Cold & Moist foods**- such as coriander, rice, beetroot and broccoli and the **least amount of Cold & Dry foods** - like yogurt, citrus fruit, legumes and tomatoes.

Bilious Temperament

Eat **mostly Cold & Moist foods** - such as rice, coriander, cucumber and beetroot, **followed by Cold & Dry foods**- like citrus fruit, basil, yogurt and mealie meal, and **Hot & Moist foods**- such as ginger, olive oil, turmeric and honey, and the least amount of **Hot & Dry foods** - like onion, eggs, alcohol and garlic. **Eat slowly, and chew the food well and thoroughly.**

The Tibb View on Indigestion

Any food, which is not digested properly, ferments in the intestines. This produces the gases hydrogen and carbon dioxide.

Psychological factors such as stress and anger can disturb the mechanisms that control contractions of the stomach and intestinal muscles.

A denaturation of digestive enzymes in H. Pylori in the gut can also cause intestinal problems. Indigestion may be a symptom of imbalance in the stomach or the intestines, mostly due to reduced digestive heat. As there are so many possible causes associated with indigestion including poor eating habits, a faulty lifestyle and certain medications, it can affect people of all temperamental types.

Some Tips to stay free of infections

- **Wash Your Hands**

  If you have been around people with colds or the flu, keep your hands away from your face and wash your hands before eating. Don't, however, be fooled into thinking that all of those antibacterial household cleansers and soaps are going to protect you. It has been found that the bacteria-busting chemicals they contain create an ideal environment for the formation of resistant bacteria. Soap and water works just fine for the hands, and vinegar (dilute and put in a spray bottle) is the perfect kitchen cleaner.

- **Gargle**

  If you're coming down with a sore throat, one of the simplest and most effective solutions is to gargle with a germ-killing mouthwash (make sure the gargle reaches your throat) or a simple salt-water solution (1 teaspoon of salt to 1 cup of water).

- **Avoid Sugar and Alcohol**

  As your body fights infection, it helps to eat wholesome, healthy foods. Sugar and alcohol suppress the immune system and can make it harder for your body to do its job.

- **Extra Vitamin C**

  Vitamin C can help fight infections and viruses. If you take 1,000 to 2,000 mg every three to four hours as soon as you feel a cold coming on. After research I conclude Ascorbic acid is not Vit C, for pure Vit C you should eat Guava & Oranges.

- **Vitamin A**

  Vitamin A is a powerful infection-fighter. It is an immune stimulant that boosts thymus gland function and helps maintain healthy cells in your mucus membranes.

- **Vitamin D**

  Vitamin D is essential for a healthy immune system. People who don't get out in the sun or who have long, gray winters should take at least 2,000 IU of vitamin D3 daily.

Imp. Highlights

"Allow a Fever to Run Its Course". Bacteria are adverse to high temperatures, which is why we sometimes get a fever when we get infections. This is why it's important to not bring down a fever unless it's dangerously high. The fever is the very thing that will kill the bacteria or virus that's making you sick. In children in particular, a fever is part of the body's mechanism for training the immune system to recognize hostile bacteria & viruses & forming antibodies that will recognize them in the future. If you suppress fever with acetaminophen, your child could be more likely to get sick again the next time the bug comes to visit.

Where did this knowledge of medicinal plants come from?

Whenever I read an old book about herbs & their benefits then as I relate this with new scientific researches, recurrently the most frequent question that came in mind is, Where did the knowledge of medicinal plants come from? Over the centuries, many herbal pharmacopeia have been produced, describing the physical characteristics and chemical properties of natural substances used for a wide range of ailments. Currently there are more than fifty thousand herbal or natural ingredients, which are known to have a wide range of pharmacological actions, and these are often used to treat various illness conditions. An example of this is garlic (Allium sativum) which is known to have many pharmacological actions, including anti-inflammatory, anti-spasmodic, carminative, expectorant, aphrodisiac, disinfectant and anti-microbial, as well as blood pressure and cholesterol lowering properties. Where did all this information come from? When I start to treasure the answer of this question I figured out that our knowledge of how herbs benefit people with maladies and illnesses, or how one herb will be a tonic, and another help a person sleep, comes from several sources.

One is by observation of animals, which will often consume different herbs to, for example, encourage vomiting or remove intestinal worms. Also, observing someone who has inadvertently (or deliberately) consumed a certain herb, and noting the effects, will tell a lot about the herb. This is the empirical route to obtaining information, and is often tied into intuition, or gut feeling, about the benefits or otherwise of a particular herb. Another is based on collective experience over the centuries. The effect of a plant or herb, or a part of it, such as the leaf, stem, flower, etc. studied over many years provides a huge body of information on special herbs grown in a particular area. This has led to the creation of numerous "materia medica" or catalogues describing, often in exquisite detail, the nature of an herb or medicinal plant, the part used, the extractive process adopted, and the dose employed for a particular ailments.

Stance of Tibb-a-Nabawi about the source of this divine knowledge

Recent scholars have, in their definitions of Ṭibb al-Nabawī, tried to be as comprehensive as possible. Consider the following definition posited by Muḥammad Nazzār al-Daqr: "Ṭibb al-Nabawī may be defined as the science which combines

Imp. Highlights

Remember: treatment comes from outside, healing from within.

The internal doctor that heal us is known as Physis. Tibb can also be defined as: "The art of serving, with respect, the physis of each person".

"We must emphasize that we do not see holism as 'right' and western medicine as 'wrong'. In fact, Ibn Sina himself embraced the principles of scientific methods. He 'sets out clearly the three methods: agreement, indifference and concomitant variations - that are usually regarded as characteristics of modern sciences".

Hakim Mohammed Said Shaheed Sahib.

all that has come to us from the Messenger of ALLAH (SW). This would include the verses of the Qur'ān, the blessed Prophetic Traditions (aḥādīth) and will also include the prescriptions of the Prophet PBUH as he administered treatment to some of his Companions (may Allah be pleased with them all) when they asked him for cures, or when he instructed them in some remedy.

To elaborate on the fact that knowledge of the use of medication could also have come from revelation or inspiration, we can look at the example of salicylic acid.

Salicylic acid, which is derived from the bark of the willow tree, was known to provide relief from pain, fever and in inflammation for many centuries. This active ingredient was isolated over a hundred years ago, and changed chemically to acetyl salicylic acid, better known as 'aspirin'. It has been the mainstay of pain relief and fever alleviation for many years.

In the last twenty years or so, aspirin has been found to prevent blood clotting, as it is now used as preventative treatment of disorders caused by blood clots, such as heart attack and some strokes. In addition, aspirin is now being investigated as a substance which may reduce the development of colon cancer. These additional uses of aspirin only became apparent after extensive research and using the latest available technology, which took more than twenty years. This begs the question; how does one explain the knowledge in the use of more than fifty thousand plants with respect to the pharmacological action of the numerous active ingredients that exist in each plant? Surely this Information must have been divinely inspired...

Why should use herbal remedies instead of a single chemical?

Herbal medicines have a more complex way of working than do most conventional drugs consist of a single chemical. Individual active substances in herbs, such as alkaloids, have similar mechanisms of action to the conventional drugs, and a act on specific active sites. However herbal products contain many other active substances, such as adaptogens, immune system boosters and anti-oxidants, which confer different and distinct effects. They can make the product safer to use, reducing the risk of side effects. Herbal medicines act to restore imbalances in qualities, strengthen the body's vital organs, and ultimately bring inner harmony back to the body. They encourage and support the patient's physis, often by stimulating the immune system.

Imp. Highlights

Ṭibb al-Nabawi believes this knowledge was divinely inspired as mentioned in As-Suyuti's 'Medicine of the Prophet':

Traditionally Hazrat Seth son of Hazrat Adam was the first to make knowledge of medicine known .... Hazrat Idrīs .... evolved the science of Philosophy and medicine. ..... more likely that (knowledge of medicine) was revealed by Allah-(SW) to His people. This much is certain that guess-work and experience alone are not sufficient"

Also:

Hazrat Sulaymān acquired knowledge of plants as they grew in front of him.... what is your name what are you for.... cultivate the species... and record it"

Healing comes From ALLAH (SW)

"I entered the tent of the Prophet (PBUH) with my father, who was a physician. My father diagnosed that the Prophet g had a back infection, so he said, 'Please let me treat this back infection of yours, for I am a physician'. The Prophet g replied, 'You are my friend. Allah c is my physician[99]" The above Hadīth reported by Abū Ramthah (RH), a Companion of the Prophet (PBUH), highlights that whilst treatment may be provided by a healthcare professional, the outcome is dependent on the will of Allah (SW). As Muslims, we accept that Allah (SW) is in control of every aspect of our lives including our health, whether in health maintenance or in the treatment of disease. Allah (SW) has bestowed a divine intelligence in each of us; this is embedded in the genetic makeup of every cell in our body. This intelligence works in a pre-determined, instinctive manner with a capacity of self-healing and for the perpetuation of life. This inherent wisdom is not only part of our genetic makeup, but also in every living entity, from the smallest life form to the perfection of creation, the human being. In man this inherent wisdom, is called 'Physis' [100].

Islamic Guidance about Hygiene

Hygiene is defined as the "science and art of preventing disease by deliberate, personal action". The concept of hygiene goes back millennia, to the time of Hippocrates and beyond. It was incorporated into Islamic doctrine in its early days. In Islam, cleanliness of the body is the natural disposition of man in the promotion of good health. Hygienic practices which are in keeping with the Sunnah of the Prophet (PBUH) include the trimming of nails, removing the hairs in the armpits and the groins, shortening the moustache, being circumcised and especially keeping the teeth clean[102]. The wisdom of these various hygienic practices has been reinforced by countless of scientific studies in recent times. For example, the practice of frequent and thorough hand-washing, advocated by the Prophet (PBUH) has been shown by modern clinical science to be the single most important personal activity to ward off illness arising from pathogens.

The cleansing practice of wuḍūʾ and ghusl

Islam has provided clear directives on hygienic practices such as the ritual cleansing practice of wuḍūʾ and ghusl. "O believers, when you stand for prayer, wash your face, and your hands up to the elbows, and wipe your heads, and wash your

Imp. Highlights

Source of all healing in the Islamic perspective is Allah SW as mentioned in the verse below:

"And when I fall ill, so it is He who heals me " (Quran 26:80)

The Quran itself is a healing for all ailments, be they related to the mind (psychological), body (physical) or the soul (spiritual).

"And We send down in the Quran that which is a cure for the believers and a mercy. (Quran 17:82)

Hippocrates said:

"It is more important to know what sort of a person has a disease than to know what sort of disease a person has."

So it is very important to understand temperament of the patient before disease.

feet up to the ankles. If you are unclean, bathe and purify your bodies fully. But if you are ill or in the middle of travelling or you cannot find water, then take wholesome dust and wipe your faces and hands with that. For Allah (SW) does not wish to burden you, rather He desires to purify you and to complete His blessing and favor upon you so that, perhaps, you may be grateful" Qurān 5:6

Oral hygiene

Researchers concluded that H. Pylori can be spread through saliva and infection chances increase with the poor oral hygiene. Ṭibb al-Nabawī strongly advocates scrupulous care of the mouth teeth and gums. One way is by using miswāk. This is a toothpick obtained from the 'toothbrush tree', or Salvadora persica which contains a number of compounds which act against pathogens, especially bacteria, present in the oral cavity. The importance of the use of miswāk is emphasized in the following ḥadīth: "If it would not be difficult for my ummah, I would order them to use miswāk before every salāh".

The Use of Iṭar (Essential Oils)

A pleasant iṭar (perfume) is an established Sunnah practice of the Prophet Muḥammad (PBUH). "Perfumes are the most suitable and favorable remedy and substance for the soul. There is a close connection between the soul and scented perfumes. Perfume helps the brain ... and brings comfort to the heart and soul. This is why perfumes were among the dearest in this world to the heart of the Prophet (PBUH)".

Supplication (Dua)

The greatest weapon that the believer has is that of supplication. ʿAlī h narrates from Prophet g that he is reported to have said: "Supplication is the weapon of the believer, the pillar of the religion and the light of the heaven and earth." There are numerous aḥādīth, wherein a cure for a particular ailment, the individual is required to recite a duʿā (invocation) and then blow on themselves.

Hazrat Aishah (RH) narrates that: "During the Prophet's g fatal illness, he used to recite the muʿawwadhatain (Sūrah al-Falaq and Sūrah al-Nās) and then blow his breath over his body. When his illness was aggravated, I used to recite those two sūrahs and blow my breath over him and make him rub his body with his own hand for its blessings"

Imp. Highlights

When it comes to restoring health, the following quotation, appropriately describes the working of physis:

"In fact, no herb, no food or any other substance or procedure can do anything on its own to heal.

It can only assist the body in its own self-healing.

If your finger is cut, it is not the stitches or the bandage or the iodine that causes it to heal, it is the skin itself that performs the miracle"

"Each person carries his own doctor inside him. We are at our best when we give the doctor who resides within each patient, a chance to go to work"

Albert Schweitzer

Some other herbs that eradicate H. Pylori

GARLIC

Garlic, Allium sativum, is invaluable not only as an essential flavouring element in food but also for its therapeutic properties.The interest in studying the therapeutic properties of garlic on H. pylori-related diseases arose when an inverse relationship between garlic consumption and the incidence of gastric cancer was reported.(134)

The in vitro anti-H. pylori activity of extracts and compounds obtained from garlic has been extensively documented, although a few studies reported negative results. An aqueous garlic extract, standardised for its thiosulphinate concentration, had a minimum inhibitory concentration (MIC) of 40 µg/mL, and for other garlic compounds (allicin, ajoenes, vinyldithiins, thiosulphinates), the MIC values were approximately 10 to 25 µg/mL.(135-136-137)

HONEY

Honey is widely known for its antibacterial properties. The attributed antibacterial mechanisms are: an osmotic effect due to its sugar content, its hydrogen peroxide content (produced by the glucose oxidase added by the bee), its acidity, and other substances derived from flowers. Honey has been studied for its anti-H. pyloriactivity in vitro.(138-139)
Manuka honey comes from one flower source. This honey has been shown to possess bacteriostatic properties against H. pylori at a 50 mL/L concentration.(140)

GINGER

Most people are familiar with ginger as a seasoning, but it actually has been used for thousands of years as a medicinal herb. A study at the University of Illinois, Chicago, found that ginger root extracts inhibit the growth of H. pylori in vitro.(141)

LICORICE

A study at Toho University, Chiba, Japan, found that licorice extracts are also effective against H. pylori strains that are resistant to both amoxicillin and clarithromycin, making them viable as chemopreventive agents for peptic ulcer or gastric cancer in H. pylori-infected individuals.(142)

Imp. Highlights

The study was conducted on 88 adult patients attending King Fahd Hospital of the University, Al-Khobar, Saudi Arabia, from 2007 to 2008, with dyspeptic symptoms and found positive for H. pylori infection by histopathology and urease test. Patients were randomly assigned to four groups, receiving i) triple therapy (TT) comprising of clarith-romycin, amoxicillin, omeprazole [n= 23], ii) 1 g NS + 40 mg omeprazole (OM) [n= 21], iii) 2 g NS + OM [n= 21] or iv) 3 g NS + OM [n= 23]. Negative H. pylori stool antigen test four weeks after end of treatment was considered as eradication.

Results: H. pylori eradication was 82.6, 47.6, 66.7 and 47.8% with TT, 1 g NS, 2 g NS and 3 g NS, respectively. Eradication rates with 2 g NS and TT were statisti-cally not different from each other, whereas H. pylori eradication with other doses was signific-antly less than that with TT (P < 0.05). Dyspepsia symptoms improved in all groups to a similar extent. Conclusions: N. sativa seeds possess clinically useful anti-H. pylori activity, comparable to triple therapy.

Conclusion

Hippocrates once said, "Let your food be your medicine, and your medicine be your food."

In this file I added some best antibiotic herbs literature that we can add in our daily food to combat against harmful Helicobacter bacteria. It is important to understand that we are designed by Allah (SW) to heal our self in most cases. By adding these natural food medicines to our life, we can actively work to keep our body healthy and in balance.

These natural antibiotics are available to you right now! Instead of waiting until you get sick or discover that drugs don't work on whatever strain of bacteria, virus or disease you have, you can start building up your immune system in advance.

These foods and herbs haven't lost their ability to fight bacteria. Bugs do not become immune or resistant to them. From hundreds of years ago to our modern time, what worked then still works today. I estimated that most of the natural antibiotics are also known as "astringent" foods, they naturally cleanse your blood without harmful side effects or upsetting the delicate balance of good bacteria in your body.

The natural antibiotic properties of many herbs are only now being analyzed and confirmed by scientists around the world. They represent natural alternatives to boost your immunity and add an excellent variety to your food preparation. Prescribed antibiotics kill all bacteria – both the good and the bad – leaving your body stripped of its natural ability to fight infection and ward off illness. But natural drugs work synergically to boost your immunity and help physis to fight against harmful pathogens. We can help the situation and avoid antibiotic drugs by harvesting the powerful substances nature has given to us. Both animals and man have harnessed the medicinal power of herbs for at least as long as history has been recorded. Plant alternatives use different mechanisms of action against microbes so, herbal antibiotic choices can help without further contributing to resistance issues. **Using herbal medicines can help us make natural choices for our best medical care – and we can then save the drug antibiotics for when they are really needed.**

Imp. Highlights

To find the top herbs that can be effectively used for treating antibiotic-resistant organisms, I have relied on decades of scientific experiments, the cumulative experience of great practitioners, many dozens of journal papers of very good research by committed researchers from many countries around the world, and the history of use of these plants by local peoples over centuries. I have concluded, to truly slow and eventually reverse antibiotic resistance, it will require us to stop using antibiotics unnecessarily on an individual level and as a world community by ceasing the use of antibiotics as growth enhancers in the animal feed.

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