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A Novel, Scientific, Safe and Effective Ayurvedic Approach for Global Health: Ayurveda Plant Nanocellopathy

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Abstract

It is analyzed in the Global Burden of Disease Study 2013 that more than a third of the world's population is suffering from five ailments or more. Complementary and alternative therapies are one way to answer such global health concerns. This paper presents a novel ayurvedic approach developed after 26 years of research on the synergies of different plant-extracts based oil-blends. The approach/concept is based on the Ayurveda Plant Nanocellopathy which is related to nanoscience based system. The salient features of this novel approach are its topical use only treatment with no added chemicals, non-metabolized way with no medicine ingestion. It is a standardized, scientific, safe and proven effective treatment for numerous diseases like polycystic ovarian syndrome, osteoarthritis (an alternative to knee replacement), many lifestyle ailments, infections and allergies and even bio-terror. The natural herbal plant extract oils can be used with conventional treatments as adjuvant or as stand-alone therapy to safeguard human life across the globe.

Keywords: Ayurveda plant nanocellopathy; Active nano extracts; Polyherbal, Plant extracts; Topical application; Poly cystic ovarian syndrome; Osteoarthritis; Diabetes; Viral infections; Bio agents; Bio terror; Health epidemics

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Introduction

Diseases are a part of human life and affecting the normal living since time immemorial. According to the Global Burden of Disease Study 2013, one-third of the world's population suffer from more than five ailments and the portion of number of lost years of healthy life due to illness increased from 21% to 31% [1]. Over the past five hundred years, mankind has evolved its understanding of the medical science and the workings of the complex human system. The past two hundred years or so has seen rapid advancement of antibiotics, vaccinations and medicines to the advent of bio-technology. Since long, man has innovated remedies from nature to prevent and treat infections and ailments. Natural products from plants are in use, for their medicinal values with economical consideration, for providing solutions for many emerging health issues [2].

Ayurveda since thousands of years is one of the traditional medicinal systems of India [3]. Around 15,000 medicinal plants have been recorded in India only. Ayurveda encompasses the

use of natural elements to remove the root cause of the disease and aims to restore balance by creating a healthy life-style to prevent the recurrence of imbalance. The concept of Purush-Prakriti (Man and Nature) symbolizes inherent harmony. This harmony is well reflected in the Vedas, wherein harmony within man and harmony between man and nature has been elaborately discussed. World Health Organization has estimated that 80% of the world's inhabitants still rely mainly on traditional medicines for their health care [4]. The authors Parasuraman, Thing and Dhanaraj have shared that treatment can be done with ingredients from either a single plant/herb element or with a combination of multiple herb/plant elements [4]. Ayurveda literature including the Sharangdhara Samhita indicates that active phytochemical constituents of individual plants can be used to form a polyherbal formulation for therapeutic effects [5]. As per the Sharangdhara Samhita, "a synergy of herbs is far more potent than a single herb to treat any ailment." It is studied that combination of the multiple herbs in a particular ratio results in better therapeutic effect and also reduction in toxicity [6].

Methodology Adopted

Keeping in consideration the key tenets of Ayurveda, this paper presents a novel approach of treatment based on the concept of Ayurveda Plant Nanocellopathy using plant extract based oils. These plant extract based oils work on the principles of Ayurveda with the help of their inherent Active Nano Extracts to provide treatment solutions to different diseases. The aim is to provide a standardized, scientific, safe and proven effective treatment for numerous diseases.

The next part of the paper talks about basic foundations of Ayurveda and its pole position in providing health care solutions using the medicinal properties of plants. Next sections present the concept of Ayurveda plant nanocellopathy and mechanism of action by active plant nano extracts. The paper enumerates some of the applications of active plant nano extracts followed by conclusion.

Foundation of Ayurveda

Ayurveda is known as the 'Mother of All Healing' and is the combination of two Sanskrit words viz.; ayur (life) and veda (science or knowledge) meaning 'the science of life' [7]. It has focus on bringing harmony and balance in all areas of life including mind, body and spirit. Ayurveda is one of the oldest traditional medical system [3]. It indicates the characteristics, properties and values of natural herbs and plants and how mankind draw benefit from this knowledge. Ayurveda offers the therapeutic nature and protective qualities of plants, the strategic medians for topical use and their impact on the immune system and the natural processes of homeostasis.

The four Vedas, acknowledged books of knowledge and wisdom, are over five thousand years old [8]. Compendiums of knowledge, each of the Vedas have been divided into four parts for ease of classification of vast knowledge about different facets of human life. The Vedas, are perhaps the earliest texts relating to mankind, have actionable knowledge and has been compiled over centuries. These credible texts seek to explain the mankind relationship with different aspects of his external environment to improve the happiness quotient of man. Ayurveda, the science of healing and treating man, is like the ancient Wikipedia of health, and is predominantly from the Arthava Veda [9].

Ayurveda's medicinal properties

The plant extracts with therapeutic effects can be found in seeds, bark, stems, roots, flowers, and other parts of plants. They can be used as a single oil at a time or in complex blends (polyherbal) depending on plant properties, their synergy with other plant extracts and the desired therapeutic benefit. Using extracts of different plants with medicinal properties, facilitates the body's own healing power at the nano or cellular level, allowing the body's systems to effectively balance different interconnected systems; repair critical processes and support health and wellness.

A recent study revealed that compounds in certain plant extracts can reduce the inflammation caused by breathing fine air-pollutant particles [10]. They established that these plant extract

compounds were able to lower levels of two pro-inflammatory cytokines (proteins that body releases when it's inflamed) by 87% and 96%. Plant extract oils are identified with antiseptic and anti-inflammatory properties against a range of microbial agents both in vitro and in vivo, for example Eucalyptus oil [11]. Ayurveda describes about immunity (Vyadhikshamatva) in more detail. Natural herbal extracts are identified to improve the immune system in birds and immunomodulation effect of the herbal oils are said to be attributed to their antioxidant, antimicrobial and antiviral properties [12,25].

Plant-extract oils have antibacterial and antifungal activities, and can also overcome problems of antibiotic resistance [14]. A tremendous increase in antibiotic resistant bacterial strains has been observed which has made it difficult as well as expensive to control infections due to limiting antibiotic choices. It is identified that in the U.S. alone, antibiotic resistant cause at least 2 million infections and 23,000 deaths a year resulting in a \$55–70 billion per year economic impact [15]. A review study has presented that there are medicinal plants with anti-cancer and anti-oxidant properties which can be used to completely treat various types of cancers [16].

Concept of Ayurveda Plant Nanocellopathy

The basic underlying approach of 'Aarogya' (wellbeing) through Ayurveda forms the basis of what is termed by the author as "Ayurveda Plant Nanocellopathy". The term can be interchangeably used as "Ayurveda Nanocellopathy". This is based on an understanding of the different plant oils and herbal extracts. Ayurveda Plant Nanocellopathy utilizes plant extract oils directly as a therapeutic and to additionally evoke and support the body's own intrinsic healing mechanisms. These plant extract oils as polyherbal formulation then act as quick acting therapeutics along with supporting the critical processes in the body in achieving what it does naturally- homeostasis, balance, optimal health and wellness. The science of Ayurveda Plant Nanocellopathy has been developed in a scientific manner with in-built mechanisms of safety. Using the dermal route for dispensation, this technology effectively amalgamates the aspects of Nanoscience, dermal transfusion and marma points.

Neuroscience based on nanotechnology concept first explained by Richard Feynman, has enormous potential in diverse fields including medicine and pharmacology [6]. When understanding definition of the word "Nano", there are different meanings. However, more popularly now-a-days is related to nanotechnology. Nano comes from the Greek word "nanos", meaning "dwarf". It is comprehensively defined by WhatIs.com as "Nano is a prefix meaning 'extremely small'. When quantifiable, it translates to one-billionth, as in the nanosecond (<https://whatis.techtarget.com/definition/nano>). Therefore, it is a description for anything miniature or very small.

Ray and Saur has presented that nanotechnology can maximize the efficiency of therapeutic treatments [6]. Nanotechnology is playing a revolutionary role in the field of pharmacology with its innovations and advancements for the delivery of biologically active compounds. It is conceptualized that nanoparticles can

be assembled and designed in an intricate manner to be used for human benefits [17]. Applying the concept of Nie in case of a polyherbal formulation, the small size of nano-plant-extracts eases their entry at cellular level and thus directly impacts the efficacy in therapeutic applications [17]. Further, it not only increases the availability of the medicine/extract particle but also assists in the timely release of the molecule at accurate site highlighting its specificity. In this respect, using the dermal layer for dispensing the extracts has its inherent advantages- intelligent and safety aspects naturally present in the skin, its protective features and its related interaction with the immune system make this a unique and novel way of using the plant extracts without going through the traditional metabolization route. The use of marma points help in direct application of the dosage to the needed area and more can be achieved using less of the extracts. This amalgamation of techniques and technologies makes the whole process inherently safe, direct, quick acting and effective.

Nanocarriers have exclusive potentials to cross the cellular barriers for the perfect delivery of the component [18]. Nano-plant-extracts face the challenge of crossing number of physiological barriers but carry countless advantages of protecting the therapeutic molecules from degradation prior to their uptake as desired, enhancing its absorption capacity and improving its intracellular penetration and distribution [6]. Hence, these nano-plant-extracts are called by the author as Active Plant Nano Extracts or Active Nano Extracts. The author has invented the same with 26 years of his intense research work.

Mechanism of action by active plant nano extracts

Active Nano Extracts are extracted from plants by means of a variety of methods but generally with distillation or expression. An Active extract is a substance that is extracted from the tissue of a plant from its required parts, which is volatile, reactive and supports the healing process of human body. An Active Plant Nano extract is one that is delivered in a nano particle form to the targeted organ/body parts. Normally nano particles reach their targeted area transcending the lipid membranes and barriers. Based on this understanding on nano carriers or nanotechnology in the field of medicine, it is prudent to present herbal medicine in the form of nanotechnology, because nanostructured systems might be able to not only potentiate the action of plant extracts, but also work in reducing the required dose and side effects, and improving therapeutic activity. Nanosystems can deliver the active component at an appropriate concentration during the entire treatment period, directing it to the desired site of action. The conventional treatments normally do not meet these requisites effectively [19].

“Most of the biologically active constituents of extracts, such as flavonoids, tannins, and terpenoids, are highly soluble in water, but have low absorption, because they are unable to cross the lipid membranes of the cells, have excessively high molecular size, or are poorly absorbed, resulting in loss of bioavailability and efficacy” [19]. Some extracts are not used clinically because of these impediments. Therefore, the active nano extracts from the

plants through Nanocellopathy based system are able to work past this problem to achieve the desired results.

The functioning of oil-blends is based on nano-actives in plant extract oils [12,20]. Depending upon the disease to be treated/managed the plant nano-actives results in the required functioning which may have different properties and modes of functioning apart from being anti-inflammatory, anti-bacterial or anti-viral. Without interfering with the other medical sciences and treatment, this approach presents an innovative way to serve the emerging health and wellness needs of mankind. The salient features of the approach are:

1. Topical use only treatment: only a few drops of oil rubbed for 15 seconds at strategic points called marma points [21,22].
2. No added chemicals, heavy metals etc.
3. Scientific, safe and effective
4. Non metabolized approach with no ingestion of medicine
5. Direct and Targeted- Fast acting- Ease of use

Thus, Ayurveda Plant Nanocellopathy approach follows the non-metabolised route resulting in an action which is quick, direct, safe and effective. The active nano extracts penetrate the “unhealthy or diseased cells” very quickly without becoming “inactive or degraded/metabolized or transformed” in the process. The compounds are non-toxic without any added chemicals and follow a root cause approach to treating ailments; for example, in cases of type 2 diabetes, high blood sugar is not the result of absence of insulin but the depreciated capacity of the cellular structure to absorb the blood sugar due to cell oxidation, inflammation or general lethargy of the cells. In such cases, the applied oil blend helps the cells normalise their state and improve the effective absorption of sugar whose transfer is then facilitated by lower levels of insulin. This becomes a root cause approach to treating high levels of blood sugar in type 2 diabetes. This reduces the need for external stimulus through medicines and additional insulin to reduce the blood sugar and normalizes the human system faster, safer and more effectively.

Similarly, in an anti-viral treatment the polyherbal formulation blend of plant extracts works in multiple ways to protect the individuals from viral infections. Boosting the immune system and its response in multiple ways, as well as neutralise the viral strain through increased cell oxygenation and interferon pathways, Ayurveda Plant Nanocellopathy makes the whole cycle effective, nature friendly and holistic.

Applications of Ayurveda Plant Nanocellopathy

Following the philosophy of scientifically validating the traditional knowledge, numerous double-blind placebo versus nano-plant-extract oils controlled clinical studies have been conducted by an independent Clinical Research Organisation under independent expert medical supervision. These studies followed the international GCP- Good Clinical Practices guidelines and were under the aegis of the Clinical Trial Registry of India. Some of the applications are follows:

Polycystic Ovarian Syndrome (PCOS): PCOS is with an impact factor of 100 million women in India addresses a problem deeper than mere healthcare. The social impact of PCOS in a patriarchal society like India, and its effects on girls and women is of concern and critical importance.

PCOS is a set of symptoms due to elevated androgens (male hormones) in women. Signs and symptoms of PCOS include irregular or no menstrual periods, heavy periods, excess body and facial hair, acne, pelvic pain, difficulty getting pregnant, and patches of thick, darker, velvety skin. Associated conditions include type 2 diabetes, obesity, obstructive sleep apnea, heart disease, mood disorders, and endometrial cancer. PCOS is due to a combination of genetic and environmental factors. Risk factors include obesity, not enough physical exercise, and a family history of someone with the condition. Diagnosis is based on two of the following three findings: no ovulation, high androgen levels, and ovarian cysts. Cysts may be detectable by ultrasound. Other conditions that produce similar symptoms include adrenal hyperplasia, hypothyroidism, and hyperprolactinemia (https://en.wikipedia.org/wiki/Polycystic_ovary_syndrome).

Oils for PCOS management are YIN (PC) Blend and Endobal. This consists of Oregano, Sandalwood, Myrrh, Basil, Geranium, Grapeseed, Clary Sage, Cedarwood, Peppermint, Ylang Ylang, Rose, Cypress, Fennel, Myrtle, Avacado and Thyme. These unique blends of plant oils, apart from anti-inflammatory, anti-bacterial and anti-microbial properties, help balance the hormonal systems, remove ovarian cysts, improve ovulation and maintain good ovarian health. It is required to apply 4-5 drops on the pelvic region 2-3 times a day with a light rub in.

A human clinical trial was carried out to establish efficacy of the recommended oils for managing PCOS; namely, YIN (PC) Blend and Endobal by addressing the subjective (viz., irregular menstruation, menstrual cycle duration, bleeding quantity, pain during menses) and objective (viz., hirsutism, ovarian volume, number of follicular cysts, number of mature follicles) PCOS symptoms. In a two-arm parallel group, prospective, randomized, double-blind, placebo-controlled study with 100 adult female participants identified with PCOS and fulfilling inclusion criteria; were allocated between two study arms (test and placebo) in the ratio of 1:1. After treatment, in comparison to placebo, test group with blend oils showed significant decrease ($P < 0.01$) in the average composite score for subjective symptoms. Oil blends resulted in significant decrease in hirsutism, in ovarian volume in both right and left ovaries, and in number of follicular cysts on both the ovaries. Mature follicles, in 17 out of 46 participants using blend oils, increased resulting in incidences of conception after 6 months' post-study follow-up. The oil-blends effectively managed eight studied symptoms of PCOS rather than working on isolated symptoms of PCOS.

Osteoarthritis: Osteoarthritis is likely to impact a possible 300 million knee replacements over next 15 years in India. Ayurveda nanocellopathy can directly treat debilitating pain, improve joint mobility and motility and become a viable alternative to knee replacement. Apart from health this has a tremendous economic

impact as it can help save critical amount of money for the individuals and families. It will be a vital and viable alternative to knee replacement and critical for the economic wellbeing of the aged for different economies and nations.

Osteoarthritis is a chronic condition characterized by the breakdown of the cartilage that cushions the ends of the bones where they meet to form joints. In the spine, this breakdown occurs in the cartilage of the facet joints, where the vertebrae join. As a result, movement of the bones can cause irritation, further damage and the formation of bony outgrowths called spurs. These spurs can press on nerves, causing pain. New bone formation can also lead to narrowing of the spinal canal, known as spinal stenosis (<https://en.wikipedia.org/wiki/Osteoarthritis>).

A randomized, double blind, placebo controlled comparative study was carried out to assess the efficacy and safety of GoGo Pain Relief and MSM (M) oil in treatment of osteoarthritis (OA) of the knees. Based on physical examinations and participants' responses on WOMAC questionnaire (WOMAC is a Western Ontario and McMaster Universities Osteoarthritis Index), that evaluate pain and functional limitation experienced by participants in performing daily activities like resting, standing, sitting, climbing stairs and walking, due to pain, stiffness and inflammation of the joints; it was concluded that the application of GoGo Pain Relief and MSM (M) oils was effective in reducing symptoms of OA of knees. It shows that continuous application of the product results in decreased pain on movement (POM) (assessed by Visual Analog Scale - VAS), thereby increasing range of motion, finally resulting in ease in performing daily activities. Thus, the trial showed significant effectiveness on the VAS-POM scale and WOMAC Scores on reduction of stiffness; improvement in motility; reduction in pain on movement, inflammation and swelling; and improved joint health. This was also corroborated through the positive experience of the participants and their radiological scans. It was observed that there was stopping/delaying in progression of OA on the basis of Kellgren & Lawrence's 5 grade classification considering joint space narrowing, osteophyte formation, and deformity at bony ends.

Thus, the oils for OA are MSM (M) and Gogo Pain Relief. They maintain the health of different joints including lower back, knees and neck area. It stimulates circulation, relaxes and provides comfort to the afflicted joints, reduces inflammation and aids the natural process of healing. They are applied on the affected joints with light rub in.

Air pollution and pathogen control technology: This unique approach of Ayurveda Plant Nanocellopathy to reducing the bane of industrialization and economic development in the form of air pollution and air pathogens through Whiff spray is a much needed application. Whiff and its different versions contain plant extracts that float in the air to reduce different pollutants in the air and eliminate air pathogens quickly [23]. Following the Quick-Localization-Elimination-Neutralization (QLEN) approach, Whiff Bio Spray helps neutralize the spread of drug resistant pathogens through air directly as well as indirectly by reducing micro pollutant air particles that serve as carriers for the bio-agents

including viruses. This technology opens up vistas in tackling bio terror and health care epidemics of the like of SARS and COVID-19 the current Novel Corona pandemic [24].

The study on effectiveness of Whiff Bio Spray to reduce air pathogens and the air pollutants viz., PM2.5, PM10, HCHO (Formaldehyde), and TVOC (Total Volatile Organic Compound) in indoor air environments was carried out in three phases in India. First phase was conducted in a controlled laboratory environment to study the impact of spray on air pathogens. There was a significant change towards a low level of microbes with reduction of 68-93% microbes after spray in the controlled laboratory room. Second phase was conducted indoors in multi-scenario simulations. All four simulations have shown statistically significant improvement in air quality with a 95% confidence level. The third phase of the study was done in a school principal room with reception area with positive results towards better air quality. The results of the study in all three phases supported the effectiveness of the bio spray.

Viral diseases: Viral diseases are extremely widespread infections caused by a variety of bio-agents predominantly viruses. There are many types of viruses that cause a wide variety of viral diseases. The most common type of viral disease is the common cold, which is caused by a viral infection of the upper respiratory tract (nose and throat). Other common viral diseases include: Chickenpox, Flu (influenza), Herpes, Human immunodeficiency virus (HIV). **Figure 1** presents the mechanism of action by active plant nano extracts in fighting a viral infection. The plant nano-actives results in 1. stimulating the limbic system, 2. anti-inflammation, 3. immune system modulation, 4. interferon pathways, 5. viricide activity through slight increase in cell temperature, 6. neutralize anaerobic environment, 7. increased oxygenation which de-toxify the system, and 8. increased immunity. All these lead to effective viral infection treatment.

For easy reference, the generic oil blend referred as Sudarshan AV, is a combination of plant-extracts with established broad anti-viral

properties. Used in conjunction with International Committee on the Taxonomy of Viruses (ICTV), the results are reported to be encouraging to tackle a broad spectrum of viral infections. It is found effective in treating dengue within 3 days with reversal of falling platelet counts within first 24 hours. This was with relief in viral symptoms like high fever, coughing, sore throat, pink eyes, vomiting, nausea within 2 to 3 days with no other medication indicating encouraging results in RNA+ enveloped viruses like falvivirus (responsible for like, gastrointestinal tract infections, dengue among others) and for DNA double-stranded non-enveloped adenoviruses (causing fever, cough, sore throat, pink eyes). The oil-blends also treated Herpes blisters (a DNA double-stranded enveloped herpes virus) and Chickenpox (a DNA double-stranded enveloped pox virus) in 3-5 days with disappearance of sores in first 24-36 hours of oil-blends use. There are also cases on improvement of CD4 levels in patients with HIV, an RNA+ non-enveloped, retrovirus symptoms with very low CD4 counts.

Diabetes: Diabetes develops when the body doesn't make enough insulin or is not able to use insulin effectively, or both. Insulin is a hormone made by beta cells in the pancreas. Diabetes is known to cause numerous other complications and debilitations. Acute complications can include diabetic ketoacidosis, nonketotic hyperosmolar coma, or death. Serious long-term complications include heart disease, stroke, chronic kidney failure, foot ulcers, and damage to the eyes.

The oils for the solution towards Type 2 diabetes is Diabecare and Forti-5. It needs to apply 3-4 drops under each foot and massage for 1-2 minutes. Also massage 5-6 drops on the liver area, 5-7 drops on the lower back twice a day. Predominantly the oil blend contains active nano extracts of Lemon, Cinnamon, Tulsi, Peppermint, Carrot and Ginger. **Figure 2** presents the mechanism of diabetes.

Discussion and Conclusion

The approach of Ayurveda in using synergetic polyherbal

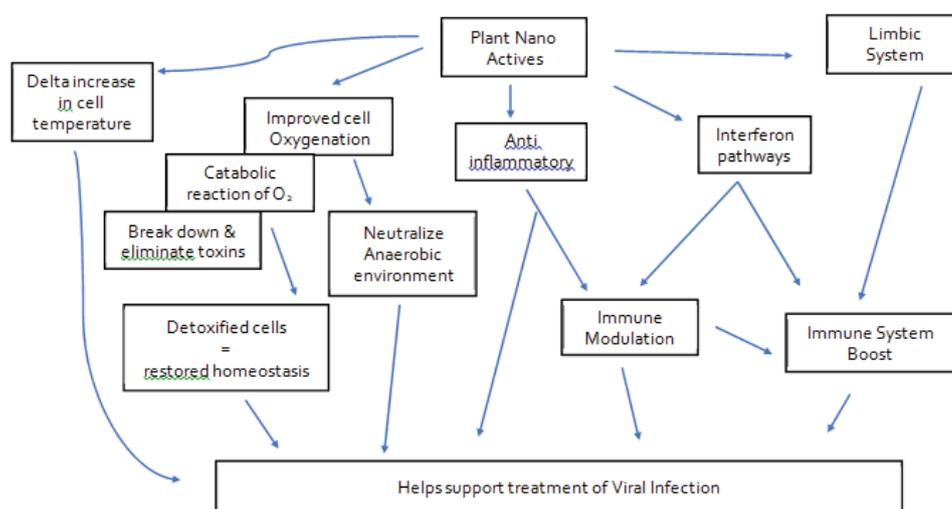


Figure 1 Mechanism of action in fighting a viral infection.

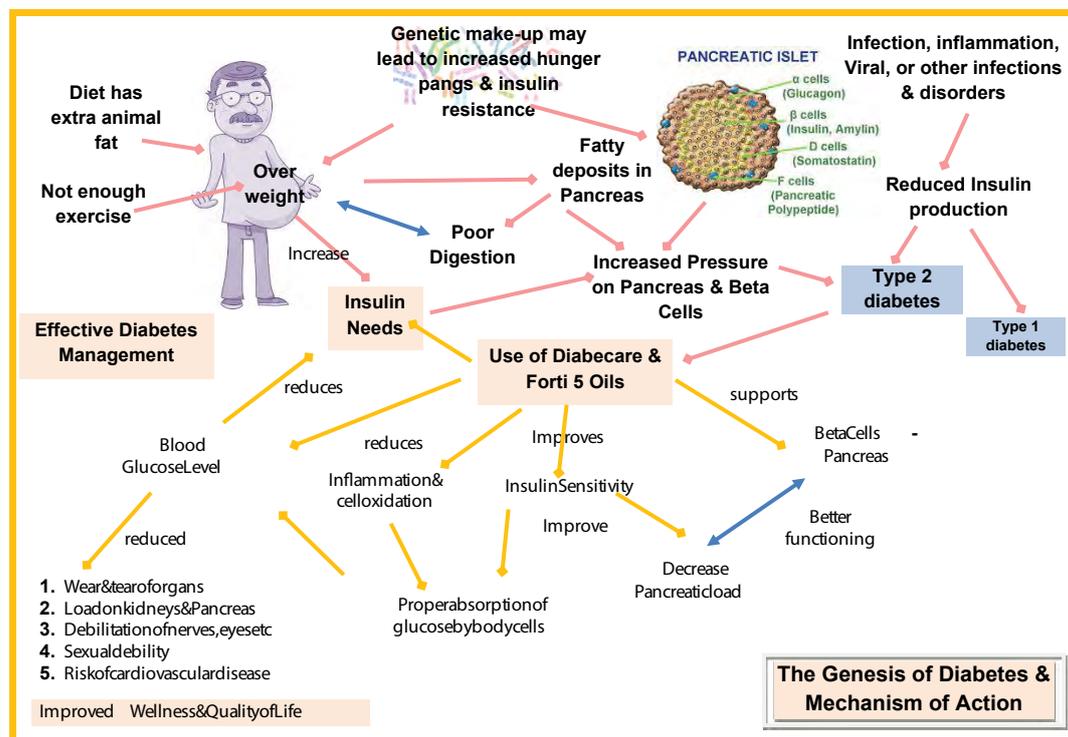


Figure 2 The genesis of diabetes & mechanism of action.

compounds is an ancient technique which has now been reinvented. This is the art and science of Ayurveda Plant Nanocellopathy. With a focus on holistic treatment, in place of the usual symptomatic approach, Ayurveda Plant Nanocellopathy clearly is a root cause approach/solution with the benefits of immediate relief in the ultimate goal of treatment.

Ayurveda Plant Nanocellopathy offers a new paradigm in how we look at an ailment and how it is treated or addressed in a 360-degree manner- directly and by preparing the body's inherent healing systems and processes. This approach is less intrusive and more bio assimilable. The aim is to complement the existing healthcare systems and bridge gaps to build competencies in therapies that impact humanity. It is also a self-sustaining approach that will reduce the burden on healthcare facilities around the globe to address other critical issues. It

provides a holistic approach ensuring better treatment and homeostasis, reducing the need for repeated treatments and leading to increase in human well-being. Improved wellness is known to improve the country's manpower efficiency, reduce the health expenditure, and enhance the quality of life and the human resource quality of a nation.

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