



REVIEW ON : HERBAL MEDICINE USED AS HERBAL NANOPARTICAL.

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Abstract: Herbal medicines have been used for several years throughout the world. Especially in India, herbal medicines are in high demand. Utilization of herbal medicines has increased because of their ability to treat various diseases with lesser side effects. The development of novel herbal formulations are reported to have remarkable advantages over respective crude drugs preparations or extracts which includes enhancement of solubility, bioavailability, protection from toxicity, enhancement of pharmacological activity, reduction in dose, enhancement of stability, improved tissue distribution, sustained delivery and protection from physical and chemical degradation. The herbal nanoparticles are colloidal system with herbal particles varying in size from 1 to 1000 nm. The objective of this review article is to summarize the drawbacks of some conventional herbal formulations and the advantages of novel herbal formulations.

Index Terms -Herbal medicine, Benefits, Herbal Nanoparticle, Use, Future Prospect, Need, Role.

I. INTRODUCTION

Medicine made from plants is as old as humanity itself. Humans probably benefited from the discovery of medicinal and fragrant plants that served as food and medicine before the concept of history even existed. Over the past three decades, there has been a significant rise in the usage of herbal medicines and supplements, with at least 80% of individuals turning to them for some aspect of primary healthcare. Herbal medicines have been extensively used in the region of the world since antique times. In India herbal medicines or traditional system of medicines such as Siddha and Ayurveda use herbal preparations. Nowadays, herbal drugs dwell in a leading position in the pharmaceutical industry as their effects are known and side effects are very negligible. Moreover, the herbal drug has a symmetrical way of interest to fabricate nanoparticles compared to synthetic drugs. Even though the herbal drug has enormous pharmacological actions toward many diseases, it has been shown an only limited effect on the human biological system due to their less kinetic performance such as low absorption, inability to cross lipid membrane, high molecular size and weight, or poorly absorbed, resulting in a reduction of bioavailability and efficacy over the biological system. Moreover, some of the extracts are not used clinically because of the abovementioned hinders. To overcome such related issues, carriers have been used as an alternative approach to amend and improve the kinetic and dynamic parts of a drug molecule on a biological system.

In recent decades, an herbal drug with nanocarriers has received a lot of attention with enthusiasm because of its future potential and its unique properties making these materials indispensable in many areas of human activity. So nano herbal systems have a promising prospect for raising the activity and overcoming the dilemma allied with plant remedy. Despite the fact that numerous herbal products have been shown to be effective, therapies utilising these compounds have showed promising potential. However, many of these medications are still being tested, and their use is either insufficiently or completely unregulated. As a result, it is difficult to advocate the safe and sensible using these agents using little information is available understand how they work, possible side effects, warning signs, and how they interact with functional foods and traditional pharmaceuticals that are already on the market. It is crucial because safety is still a key concern when using herbal treatments. Since using herbal treatments still raises serious concerns about safety, by ensuring that all herbal treatments are safe and of sufficient quality, the appropriate regulatory bodies must put in place the essential safeguards to protect the

public health. This paper examines toxicity-related issues, Significant challenges in successfully ensuring the safety of herbal medications are linked to serious safety concerns.

Numerous people are now turning to herbal remedies, phytonutrients, and nutraceuticals in a range of national healthcare systems for the treatment of a variety of health conditions as the use of these products continues to increase swiftly around the world (WHO, 2004). With these herbal cures now being sold not only in pharmacies but also in food stores and supermarkets, it is clear that alternative medicine has experienced a remarkable increase in acceptance and public interest over the past ten years, in both developed and developing nations. According to estimates, up to four billion people (approximately 80% of the world's population) who live in poor countries depend on herbal medicines as their main source of healthcare, and traditional medicine, which uses herbs, is seen as an essential part of their culture. (Martin Ekor 2014). Herbal remedies are also frequently used in many industrialized countries, and complementary and alternative medicines (CAMs) are now widely used in the UK, the rest of Europe, North America, and Australia (Committee on the Board on Health Promotion and Disease Prevention's report on the American Public's Use of Complementary and Alternative Medicine), In fact, while places like the UK have a historical tradition of using herbal medicines, the use is also widespread and well established in some further European nations. The assumption that herbal therapy will encourage healthy living is the most important justification for seeking it in these industrialised countries, outweighing all other considerations. Therefore, they spend a lot of money (in excess of billions of dollars) on herbal products because those who use them as over-the-counter drugs and at-home therapies typically view herbal medicines as a balanced and moderate approach to recovery. (Calapai, 2008), (Nissen, 2010).

II. BENEFITS OF HERBAL MEDICATIONS FOR HEALTH

correspondingly to conventional medicines, the indication of folk herbal medicine are diverse, being employed of natural remedies of a variety of illnesses. The indication spread from simple health condition such as cold, pain, surface wound to serious condition such as psychosis, diabetes, malaria, sickle cell disease, tuberculosis, cancer, hypertension, infertility and so on. Science has demonstrated that natural cures contain sophisticated chemical compounds that are accountable for the pharmacological activities, which corresponds to health benefits and or toxicity they elicit. Herbal medicine been applied as prophylaxes for the passive maintenance of health in addition for radical treatment of varieties of mild to serious disease.

In certain communities, herbal remedy is major component of the primary healthcare. Indeed, up to 80% of the rural population in Africa use herbal based traditional medicine for most of their healthcare. In Ghana, Mali, Nigeria and Zambia, the first line of treatment for 60% of children with high fever resulting from malaria and other disease is herbal medicine, which are often administered at home. A robust legacy of herbal medicine-based traditional medicine exists in rural South Africa as well. An estimated 50% among all health products consumed in India and China are herbal medicines. even in nations where conventional healthcare is available and simple to acquire, the list of therapeutic herbs and products is growing as a result of the expanding popularity of herbal medicine across the globe. Additionally, around 40% of adults in the USA have taken herbal medications. The output of herbal medicine sales is rising quickly in Canada, Australia, and Europe, particularly in Germany and France. [Nontokozo Z].

III. FUTURE PROSPECTS OF HERBAL MEDICINE

Over the past ten years, more than 121 pharmaceutical products have been developed based on herbal medicines made from plants, including aspirin, picrotoxin, and a wide range of other synthetic equivalents based on prototype chemicals obtained from plants. Future medicinal compounds derived from plants will be used in medicine, and increase quickly due to the growing acceptance of medications made from plants. Due to this, the international commerce in herbal medicine has significantly risen, drawing the attention of several pharmaceutical firms, including the multinational. Scientific evidence supporting the use of this plant has expanded due to WHO's interest in recording the medicinal plant use through ethnic groups. People will be better educated about the therapy's safety and effectiveness thanks to this. The control of plants have aided People will be better informed about the efficacy and safety of the treatment as a result. The control has of herbs improved herbal goods, but more reforms are necessary to promote and progress high-quality research. [Philip F. Builders, Nontokozo Z].

IV. WHY PEOPLE USE HERBAL MEDICINE?

- Individual tastes in herbal medicine
- Perception of safety
- Accessibility
- Affordability
- Alternative methods of providing healthcare
- Efficacy of treatments
- As the last resort

REASONS FOR THE UPSURGE IN THE USE OF HERBAL MEDICINE

In recent times, the popularity and use of Herbal medicines have cut across geographical, gender, economic and socio-cultural divisions. Indeed, Herbal medicine is occupying a strategic position in the general healthcare of people worldwide. Some of the probable reasons adduced for this include.

- 1. Personal preferences for Herbal medicine:** The use of herbal medicine is an age long tradition which is enshrined in the culture of many societies. In past times, people have relied on it as their primary source of healthcare with much success. Despite modernization and the proliferation of conventional healthcare that hinges on the use pharmaceutical drugs. Some people especially in Africa and Asia still lay personal preferences on Herbal medicine: this group of people will always prefer Herbal medicine as their first line of therapy whenever possible irrespective of their economic, educational and social status.
- 2. Perception of safety:** Generally, many lay users have the opinion that Herbal medicines are safe and carry no risk or side effects. Though Herbal medicines are natural products derived from plant materials, minerals and some animal matter, this belief is nevertheless erroneous as many Herbal medicines are not totally devoid of adverse effects. While, it is true that many Herbal medicines are comparatively more tolerable than pharmaceutical drugs especially in long time use for the management of chronic ailments. Studies have shown that in some countries such as South Africa and Ghana, herbalists far outnumber the conventional medical doctors, whereas in India, China, and Vietnam, the number of herbalists and the conventional doctors are comparable.
- 3. Easy accessibility:** Especially in rural African and Asian communities where access to conventional medical services is either expensive or difficult the only reliable, easy and quick access to healthcare is the traditional medical practitioners (TMPs) whose therapy is always based on Herbal medicine. Even in societies where pharmaceutical products are highly regulated, Herbal medicine is easily obtained at low cost and without prescriptions.
- 4. Low cost:** In many rural communities, the cost of Herbal medicines is often low when compared to those of the conventional medicines. The TMPs who provide the services are usually community members who often live in the neighbourhood of their clients (patients), as against the long distances to be traversed to reach the conventional medical centres. Most Herbal medicines are extemporaneously prepared or the herbal materials are given to the patient with an oral direction on how to prepare and use. The modalities of payment are usually more flexible as the TMPs, may accept part payments or payment in kind with items such as clothing, chickens, goats, and so on. This is nevertheless in variance to the exotic proprietary herbal products whose prices are often as high as those of the conventional medicines.

5. **Efficacy of treatments:** In recent times, there have been increased research activities to verify claims and determine safety and quality control standards for herbal materials and products. The safety and efficacy of some herbal products have been scientifically evaluated to corroborate claims. The scientific proof of safety and efficacy has contributed to the increasing confidence and popularity of many herbal products. There are also certain diseases where patients have indicated preferences for Herbal medicine instead of on pharmaceutical drugs.
6. **As the last resort:** Sometimes Herbal medicines are used as the last resort in the management of certain diseases especially when the conventional drugs have failed to yield the desired results or are accompanied by serious side effects especially in chronic diseases.

V. HERBAL NANOPARTICLE

Because they may treat a variety of illnesses that cause less negative effects, herbal medications are very popular nowadays. But efficient delivery of drugs for herbal remedies is still a work in progress. These days, several scientific methods are being developed to administer natural medications. Nanoparticle-based novel formulations have been created for the efficient delivery of herbal medicines. A nanoparticle is a very small object that behaves as a single unit in terms of its properties and mobility.

Advantages-

- Smaller size
- Higher surface area
- Higher bioavailability
- Uniform delivery of drug
- Increased stability via encapsulation
- Enhancing efficacy and therapeutic index
- Improved pharmacokinetic activity

Disadvantages-

- Very costly formulation
- Low yield
- Reduce ability to adjust the dose
- Highly sophisticated technology

VI. HERBAL NANOPARTICLES: PAST, PRESENT, FUTURE:

herbal nanoparticles past the foundation for treating human ailments has always been natural substances, especially plants. Traditional medical practises and remedies continue to serve as the foundation for modern medical advancement. Plants have been utilised medicinally long before recorded history in many different places of the planet, including ancient China, Egypt, Africa, America, and India. Early in the 19th century, chemical analysis first became practical, which sparked the extraction and tinkering of botanical constituents. In herbal preparations utilised in Indian traditional healthcare systems, many therapeutic plants with a history dating back more than a thousand years, commonly known as Rasayana, are present. In Indian medical systems, the majority of practitioners create and administer their own prescriptions. The 21,000 plants that utilised as medicines worldwide are recorded by the World Health Organization (WHO). Out of these 2500 species, 150 species are used economically on a sizable basis in India. The largest producer of medicinal herbs worldwide is India. and is known as the world's botanical paradise for a long time, herbal medicines were not considered for development as novel formulations owing to lack of scientific justification and processing difficulties, example as the standardised extraction and the naming of particular medicinal components in intricate polyherbal systems. Diseases have long been treated with herbal

therapy, which uses medicinal herbs in a variety of effective ways. The usage of natural medications has increased dramatically during the past several years. Nowadays the herbal medicine is highly demanding, because of ability of herbal drugs to treat various dispenses with lesser side effects. yet, efficient medication delivery for herbal treatments is still a work in progress. These days, several scientific methods are being developed to deliver herbal medications. Innovative compositions, such as nanoparticles, have been created for the efficient administration of herbal medications. Due to their natural origins and lack of side effects, natural remedies have experienced an exponential surge in popularity during the recent years in both developed and developing nations. Production is more challenging.

VII. NANOPARTICLES:

Nanoparticles are sub-nanosized colloidal entities consisting of synthetic or natural polymers with diameters ranging from 1 to 1000 nm. A nanoparticle matrix is used to either dissolve, trap, encapsulate, or attach the medication. Nanoparticles can be nanospheres or nano capsules, depending on how they were made. Nano capsules are systems in which the medicine is contained in a cavity and surrounded by a unique polymer membrane, as opposed to nanospheres, which are matrix systems in which the drug is physically and uniformly spread. The lipids, polysaccharides, and synthetic biodegradable polymers used to create the nanocarriers are all safe components.

Nanoparticles or nanomaterials have gained prominent advancements in nanotechnology due to their tenable physiochemical and biological performance over their counter parts. The major drawbacks of conventional are nonspecific, lack of solubility, and inability to enter inside the cells which offer a great opportunity for nanoparticles to play significant roles.

VIII. NEED OF THE NANOPARTICLES IN HERBAL REMEDIES:

- For the following reasons, herbal nanoparticles were chosen to address the shortcomings of the conventional herbal medications.
- Using nanoparticles to direct herbal medicine to specific organs improves selectivity, medication delivery, efficacy, and safety.
- Nanoparticles can be used to make herbal drugs more soluble and to localise the medicine at a specific spot, which improves effectiveness. (Sharma, 2014).
- Due to their distinct size and high loading capabilities, nanoparticles can deliver high concentrations of medications to disease locations.
- When a medicine is administered in small particles, a larger surface area of the drug allows for faster blood absorption.
- Demonstrates improved penetration and retention effects, including greater permeation through the barriers due to the tiny size and retention due to inadequate lymphatic drainage. (Chidambaram).

IX. PROPERTIES OF NANOPARTICLES

- They act as a link between atomic or molecule structures and bulk materials.
- Especially at high temperatures, because of its large surface area to volume ratio nanoparticles acts as a powerful driving force for diffusion. Compared to bigger particles, smaller particles can sinter low temperatures and in less time.
- Nanoparticle suspensions are feasible because the contact of the solvent's grip on the particle surface is strong enough to overcome differences in density, which would otherwise cause a substance to sink or float in a liquid.
- Since nanoparticles are adequate in size to trap electrons and cause quantum effects, they frequently have unexpected optical features. For instance, gold nanoparticles in solution appear dark red to black.
- Janus particles, which are nanoparticles having half of a water-loving and water-hating surfaces, particularly useful for stabilising emulsions.
- Can self-assemble and function as solid surfactants at the water/oil contact.

- Before combining a polymer matrix and nanoparticles, it is crucial to ensure that the photocatalytic activity of the nanoparticles does not cause the composite system to self-destruct.

X. ROLE OF NANOPARTICLES

- To administer the medication in tiny particles, increasing the drug's overall surface area and hastening blood clotting.
- The drug delivery system is specifically targeted.
- The medications' ability to pass through endothelial and epithelial barriers.
- To deliver the medication to the desired locations.
- Combo therapy using two separate treatments or medications.
- Does not require the inclusion of any specific ligand moiety and exhibits passive targeting to the disease site of action.
- Reduces negative effects.

CONCLUSION

Herbal medicine have been getting more attention because of their potential to treat almost all diseases. However, several problem poor solubilities, poor bioavailability, low oral absorption, unpredictable toxicity associated with the herbal medicines limit their use. Nanotechnology has established the attractive therapies to the pharmaceutical that will encounter the problem associated with herbal medicine. This review paper based on the important of nanoparticle in the herbal plant. It is anticipated that the effectual and valuable relevance of the natural products and herbal remedies being applied with the nanocarrier will enhance the significance of existing drug delivery system.

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