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Ethnomedicinal uses of Polyherbal mixtures in the treatment of skin infections: A Review

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Abstract

There are numerous skin diseases and a frequently occurring health problem that affect all ages, from the neonates to the elderly, and in many ways cause harm. For a healthy body, maintenance of healthy skin is necessary. Many people can develop skin diseases, including cancer, herpes, and cellulites, which damage the skin. In order to treat these diseases, some wild plants and their sections are commonly used. The use of plants is as old as the history of mankind. Natural treatment is cheap and claimed to be safe. It is also suitable for raw material or production of new synthetic drugs. This work reviews polyherbal formulation as a traditional treatment for skin infections and other skin related diseases.

Keywords: Skin, Skin infections, Herbal mixture, Polyherbal mixture, Phytochemical.

1.0 INTRODUCTION

The skin is the largest organ of the body which protects the body from infection but sometimes the skin itself becomes infected. WHO (2005) submitted that skin infections can be defined as maladies which are evident or obvious in the apparent coverings of the skin. They are inflammations of the skin that are caused by vectors in combination with allergic reactions to substances/organisms that exasperate the skin and thus causes itching and (or) oozing in such organisms. WHO (2005) reported that skin infections are as a result of a wide variety of microbes, and the symptoms for the various infections may differ from trivial to grave ones. Mild infections are sometimes treated with over-the-counter medications as well as home remedies, whereas other infections may require intense and specialized medical care. The skin conditions at municipal level

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Vol. 8 Issue 6
June 2021

may include: scabies, superficial mycoses, pyoderma, pediculosis, eczema or dermatitis, HIV-related skin diseases, pigmentary anomalies and acne (Hay *et al*., 2007). Common skin infection types are caused by bacteria, viruses, pathogens and fungi. Fungi are of special significance in hot environments which are majorly tropical in nature; this is because of the enrichment of their growth by high temperature and high moisture conditions which are common in tropical environment (Oladele *et al.*, 2012).

Herbs are generally valued for virtues such as food as well as medicine (Oliver, 1960). Through a long process of experimental procedures and sometimes resulting in inaccuracy (trial and error), our forefathers were able to select hundreds of wild plants in their various localities for specific uses. The information on economic front of plant use was handed down from one generation to another through word of mouth or without any published records (Oliver, 1960). Ethnomedicinal plants are utilized for the treatment of diseases and disorders like dysentery, skin diseases, hypertension, headache, boils and blisters, ophthalmic diseases, fever, etc. (Shukla and Chandel, 1972).

There is an extensive growth in the production of herbal mixtures both in developing and developed countries because of their natural origin and limited side effects. They are produced from medicinal plants and minerals and used for the treatment of different ailments including skin infections (Ahmad *et al*., 2006). However, major hindrance to the amalgamation of herbal formulation in modern medical practice is lack of scientific and clinical data proving their efficacy and safety. Polyherbal formulation (PHF) involves the use of more than one herb in a medicinal preparation. The specific concept is found in Ayurvedic and other traditional medicinal systems 1300 A.D, as pointed out by Subramani *et al.* (2014), where multiple herbs in specific ratio combinations are used to treat illnesses. It is important to establish the active components of these herbal extracts (Okigbo *et al.*, 2019) and also evaluate them for the management of common diseases and infections that predate human health.

2.0 ETHNOFORESTRY AND MEDICINAL HERBS

Ethnoforestry is defined as the creation, conservation, management and utilization of forest resources by local communities through traditional practices and folk beliefs (Pandey, 1997). For

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Vol. 8 Issue 6
June 2021

hundreds of years, practical ethno-foresting has existed. But it was only in 1997, when Deep Narayan Pandey coined the term, that ethno-forestry acquired the international recognition it now has. According to traditional customs, the word denotes indigenous management of forest resources and provides a way for sound and practical protection of nature.

Determining the exact time of using plants as drug is very difficult. There are proofs which indicate that plants have been nurtured as drugs since about 60,000 years ago (Solecko and Shanidar, 1975). Scripts about medicinal plants date back to almost 5000 years ago in India, China and Egypt, and at least 2500 years in Greece and Central Asia (Ang-Lee *et al.*, 2001).

Traditional medicinal plants are defined by the World Health Organization (WHO) as natural plant materials which are used on an indigenous or regional scale at least or in the absence of industrialized processing for the management of diseases (Tilburt and Kaptchuk, 2008). Since traditional herbal medicine is natural and is said to cause relatively less complications, Witchl (2004) stated that for thousands of years, medicinal and traditional medicine have existed and been used in both developing and developed countries. The history of herbal medicine is consistent with early medical history. The inaugural books which were written about medicine were those written about plants, including the texts of the Ebers Papyrus, which was written in the year 1500 BC, in which the names of many floras appeared (Ackerknecht, 1973). Different types of traditional drugs are widely used in Asia, Africa and Latin America to meet basic health needs of the population. This use is growing rapidly in industrialized countries, which is often referred to as complementary or alternative medicine.

According to the WHO, more than 80 percent of the world's population relies on traditional medicines more frequently today, with plants acting as the primary source of health care. This statistical data includes not only China, India and all the world's developing countries with a large population, but also several forward-thinking countries (Ganesan, 2008). While diseases are currently more commonly treated by synthetic medicinal products specifically formulated in laboratories, their definite effects on the treatment of diseases have led to the advancement of their use. The use of some synthetic drugs, however, does some harm to the body. The value and acceptance of medicinal plants and their products is increasing and the general population's trust in their use is continuously improving. (Zargari, 1992). Actually, many early medicines, such as

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Vol. 8 Issue 6
June 2021

Aspirin (from willow bark), Digoxin (from Foxglove), Morphine (from Opium poppy), Quinine (from Cinchona skin) and Pilocarpine, are the basis for clinical, medicinal and chemical studies of these conventional drugs, which are primarily extracted from plants (from Maranham Jaborandi). Currently, it is estimated that about a little above 50% of the available drugs are in one way or the other derived from medicinal plants (Fabricant and Farnsworth, 2001; Harvey, 2008). Phytotherapy is commonly used on a gradually rising basis worldwide. The global trend of synthetic substances has now turned to herbal medicines, which can be referred to as a return to nature for the prevention, treatment and control of illnesses and pains. The cradle of medicinal herbs has continued to act as Mother Nature. (Fabricant and Farnsworth, 2001).

Singh (2015) argues that there is a hopeful future for medicinal herbs because there are about half a million plants worldwide, most of which have not been studied in medical practice, and current and future studies of their medicinal properties and activities could be helpful in disease treatment. The depletion of medicinal plant species because of the non-principled use of these tools is one of the problems facing medicinal plants. According to the International Union for Conservation of Nature, there are between 50,000 and 80,000 flowering plant species that are used for pharmaceutical purposes around the world. Bentley (2010) estimated that, because of the high rate of collection and degradation of environments, approximately 15,000 species within these numbers are vulnerable to a risk of extinction. Ross (2005) also stated that due to increasing human populations and unreasonable plant consumption, approximately 20% of their flora and fauna resources are decreasing. Consequently, Pan *et al*. (2013) noted that in the harvesting, processing and use of these resources, the environmental rules and regulations that improve the biodiversity of flora in the processes of extracting natural resources to discover natural drugs should be taken into account. In an attempt to promote the regulation of herbal medicines, good agricultural practice (GAP) for medicinal plants is planned to control production and to certify quality (Chan, et al., 2012).

3.0 FUNCTIONS OF THE SKIN

Human skin, which is the outer covering of the body, is the largest organ in the human body. It also constitutes the first line of defense against infections (WHO, 2005). Skin contains many

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Vol. 8 Issue 6
June 2021

specialized structures and cells and is divided into three main layers viz. epidermis, dermis and hypodermis. Each layer provides a special role in the overall function of the skin (WHO, 2005). Epidermis, which is the outermost layer of the skin, varies in thickness in different regions of the body. It is thinnest on the eyelids (0.05mm) and thickest on the palms and soles (1.5mm). The dermis also varies in thickness depending on the location on the skin. It is 0.3mm on the eyelid and 3.0mm on the back of the body. The dermis is attached to an underlying hypodermis or subcutaneous connective tissue. The subcutaneous tissue is a layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important in the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and among individuals. Hair follicles, sweat glands and sebaceous glands are the main skin appendages. The skin protects the underlying muscles, bones, ligaments and internal organs.

Skin plays a major role in protecting the body against pathogens as well as excessive water loss for the fact that it comes in contact with the immediate environment man lives in. Other functions of the skin include insulation, regulation of temperature, sensation, storage and production of essential vitamins such as vitamin D by exposure to electromagnetic (UV) rays and the fortification of vitamin B folates, absorption of gases such as oxygen and medicines and resistance to moisture. Severely damaged skin will try to heal by forming scar tissue. This is usually discolored and depigmented.

p-ISSN: 2348-6848
e-ISSN: 2348-795X
Vol. 8 Issue 6
June 2021

4.0 Skin Infections AND THERE CAUSES.

Skin disease is a common disorder that affects all ages, from babies to the elderly, and can cause harm in a variety of ways. There are more than a thousand conditions which may affect the skin, but these common forms can be classified into most skin diseases.

Bacterial skin infections

Bacterial skin infections often start as tiny, red bumps which increase in size gradually. Some bacterial infections are mild and can be treated easily with topical antibiotics, but oral antibiotics are required for other infections. Cellulitis, impetigo, boils, and different forms of bacterial skin infections include:

Viral skin infections

These normally occur as a result of the virus infiltrating the stratum corneum, causing the inner layers of the skin to become contaminated. Herpes simplex, shingles (herpes zoster) and warts can be examples of viral skin infections. The skin may also be infected by some systemic viral infections, such as chicken pox and measles. Viral infections have been reported to be incurable simply with the help of antibiotics.

Parasitic skin infections

A parasite is responsible for these types of skin infections. These infections can spread to the bloodstream and other vital organs beyond the skin. A skin infection that is parasitic is not life-threatening, but may cause very noticeable discomfort. The different types of transporters of parasitic skin infections can include: lice, bedbugs, and migrants of the cutaneous larva . Depending on the form, the symptoms of a skin infection differ too. Symptoms that are normal include redness of the skin and rashes. Itching, discomfort, and tenderness are other symptoms.

Bacterial skin infection

These usually occur where the skin has been affected previously: skin defects, cuts, bruises, burns, insect bites, surgical wounds, injection of circulatory drugs or intravenous catheter insertion sites (Habif and Thomas, 2001).

- Viral skin infection

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Vol. 8 Issue 6
June 2021

Two major classes of viruses are responsible for virus-related cutaneous conditions; forms of DNA and RNA, both of which are mandatory intracellular parasites (Lebwohl et al, 2010).

- Parasitic infestations

  Diaz (2010) reported that annelida, arthropoda, bryozoa, chordata, cnidaria, cyanobacteria, echinodermata, nemathelminthes, platyhelminthes and protozoa are the phyla groups of organisms which cause stings and bites leading to infections in human beings.

5.0 EFFICACY OF HERBAL MIXTURES

Formulations containing two or more herbs are called polyherbal formulation (PHF) (Subramani *et al.*, 2014). The high efficacy of PHF in the treatment of a large number of diseases is attributed to its popularity. They have a wide variety of treatment choices (effective at low doses and safe at high doses), fewer side effects, are more environmentally friendly, cheaper and readily available. It is worth noting that PHFs are not always stable (Tayade *et al.* 2015,). As described by Charaka Samhita; a Sanskrit text on Ayurveda (Indian Traditional Medicine), Ayurvedic formulations have adverse effect when prepared or used inappropriately (Meulenbeld, 2002). Due to the source and development method, patients, Ayurvedic practitioners, drug-herb interactions, clinical reproducibility, toxicity due to inappropriate processing and irrational prescription of PHFs, as well as laws and regulations, PHF problems occur. In spite of all these problems, poly-herbal formulation is growing in popularity and therefore needs further scientific study in this area. (Tayade *et al.*, 2015).

The drug formulation in Ayurveda is based on two principles: the use of more than one drug as a single drug and the use of more than one drug, known as PHF. According to Srivastava (2013), this primary conventional therapeutic herbal strategy uses the combination of multiple medicinal herbs to gain extra therapeutic benefit, typically referred to as polypharmacy or polyherbalism. Historically, in 1300 A., the Ayurvedic literature "Sarangdhar Samhita" was dated centuries ago. D. The notion of poly-herbalism in this ancient medicinal scheme has been highlighted. Plant

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Vol. 8 Issue 6
June 2021

formulations and combined extracts of plants are chosen rather than individual ones in the conventional method of Indian medicine. It is known that Ayurvedic herbals are prepared in a number of dosage forms, in which mostly all of them are PHFs (Jayakumar, 2010).

Even though the active phytochemical constituents of individual plants have been well established, some are usually present in minute amount and always, they are insufficient to achieve the desirable therapeutic effects. For this, some scientific studies; such as one reported by Spinella in 2002 on the importance of pharmacological synergy in psychoactive herbal medicines have revealed that these plants of varying potency when combined may theoretically produce a greater result, as compared to individual use of the plant and also the sum of their individual effect. This phenomenon of positive herb-herb interaction is known as synergism. Certain pharmacological actions of the active constituents of plants are noteworthy only when their efficacy is enhanced by that of other plants, but not evident when used in isolation or singly (Parasuraman, 2010).

Pole (2013) has shown that it is noteworthy that herbs are often considered to be irreconcilable (viruddha) and should therefore not be taken together in polyherbal remedy preparation. Quantitative incompatibility, energetic incompatibility or practical incompatibility may be attributable to such incompatibility. For instance, due to conflicting tastes and temperatures, ghee should not be taken in equal proportions with honey by weight; whereas laxative and astringents result in antagonistic behavior in which they counteract the actions of each other. There is a need for well-designed clinical trials prior to marketing to ensure the compatibility of several herbs in the PHF formulation.

PHF has recently started to gain worldwide popularity, as mentioned earlier, due to the fact that PHF has certain advantages that are not present in allopathic drugs. Firstly, in a large number of illnesses, PHFs are considered to express high efficacy. Also, due to the presence of various phyto-constituents, the therapeutic effect of herbal medicines is exerted and the effects are further potentiated when compatible herbals are formulated together in PHFs. According to Little (2009), the effectiveness and satisfactory aftermaths of the procedure have been found to be the key factor that underlines the use of medicinal herbalism. Secondly, it is commonly found that PHFs have a wide therapeutic range. Most of them, as Joshi et al. (2007) said, as a result of being involved even at a lower amount and safe for use at higher prescription, have a higher chance of benefiting quotient.

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e-ISSN: 2348-795X
Vol. 8 Issue 6
June 2021

People may opt for Ayurvedic therapy in which undesirable side effects are absent or minimal, as seen in modern allopathic drugs. Seizures, impotence, insomnia, confusion, weakness, hair loss, dry mouth, diarrhea, vomiting, organ toxicity and even death are the adverse effects sometimes found in these synthetic medications despite their successful therapeutic performance.

Since PHFs are a product of nature, they are comparatively cheaper, more environmentally friendly and more readily accessible than allopathic drugs. Increasing demand globally, especially in rural areas and some developing countries where expensive modern treatments are not available, is due to their better affordability and greater accessibility. In addition, polyherbal remedies have long stood in some tribes as cultural values, customs and traditions throughout history, which are based on centuries-old knowledge of trials and errors.

Despite the fact that Ayurvedic PHFs are advantageous in many ways to humanity, certain inevitable disadvantages still threaten them, impacting their effectiveness in treatments. These issues lie within the origins and development process of the PHFs, patients, Ayurvedic doctors, as well as the laws and regulations that regulate them. (Meulenbeld, 2002).

There is a clear misconception, which is untrue, that Ayurvedic PHFs are always secure. Charaka Samhita himself claimed that Ayurvedic medicines, when prepared or used inconsistently, have adverse negative effects (Dey, et al. 2014). The simultaneous use of PHFs with allopathic drugs is on the increase as most patients do not inform their medical practitioners on the affiliated treatments (Pal and Shukla, 2003). However, many have not noted the possible drug-herb interactions, which may affect their pharmacological or toxicological effects, and subsequently results in adverse effects that can lead to a deterioration in the health of an individual (Hussain, 2011: Ismail, 2009).

6.0 CONCLUSIONS

It was concluded that poly-herbal medicines have great potentials in curing various types of skin infections and a number of rural and urban dwellers still depend on traditional healing method for the treatment of skin infections and associated diseases. Herbs are a rich source of active ingredients and can be safer and cost effective.

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Vol. 8 Issue 6
June 2021

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Vol. 8 Issue 6
June 2021

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Vol. 8 Issue 6
June 2021

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