Formulation and Application of Herbal Preparation for Bacterial Pathogen

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Abstract

Thousands of plants are utilised as antibiotics in traditional medicine across the globe. While some have undergone in vitro screening, the effectiveness of herbal medications is seldom subjected to rigorous testing in controlled clinical studies. Antibiotic therapy for bacterial infections is often provided by conventional medications, but the rising issue of antibiotic resistance necessitates constant research into alternative treatments. Herbal medications are preferred by some patients despite the fact that there is no evidence to suggest they are any safer than conventional antibiotics. Hence, medical personnel should be conversant with the data supporting the use of natural antibiotics. This research analysis was conducted to objectively evaluate the effectiveness of herbal antibiotics that have undergone rigorous clinical testing.

Keywords: Herbal Medicines, Antibacterial, Clinical Trials.

INTRODUCTION

Before the discovery of antibiotics, the only treatment options for infectious diseases were herbal plants, plant preparations, and phytoconstituents, all of which have shown promise in reducing symptoms (many being of plant origin themselves). Viruses continue to account for the vast majority of human deaths due to infectious illnesses (Jadad, et al., 1996)1. Herbal medicines include a wide range of phytoconstituents that have been investigated for their potential antiviral effects. In light of this motivation, a web search was conducted, yielding a long list of plant species containing antiviral compounds. Several of the analysed references mention these herbs either alone or in combination. "The literature search revealed initiatives against the rabies virus, the human immunodeficiency virus, the chandipura virus, the Japanese encephalitis virus, the enterovirus, influenza A/H1N1, and other influenza viruses." All known plant species with antiviral activities are included in this analysis. The study also includes the chemical make-up and manufacturing processes of antiviral medications from throughout the world. This page includes a comprehensive breakdown of the formulations that have been submitted for patent registration, as well as a discussion of alternative, non-patented formulations. Given the lack of acceptable treatment candidates and the growing resistance to current drug molecules for many new and re-emerging viruses, herbal sources present researchers with great opportunity to discover and bring forth effective options against viral illnesses.

Many of the riddles surrounding human illnesses may be solved by using the many different herbal plants available via complementary and alternative therapy. One statistic from the World Health Organization (WHO) indicates that eighty percent of the populace of poor nations relies on indigenous plants for meeting their health needs (Aydin et al., 1997)2. "Herbal plant extracts (used in Ayurveda as mentioned in the Charaka Samhita and Susruta Samhita or other traditional medicine practises), plant deduced substances phytoconstituents), recognised as (also derivatives of specific plant parts" (roots, arise, bark, floral, fruits, and seedlings), "dietary supplements, and nutraceuticals find wide application in treating ailments ranging from common to rare infectious and non-infectious diseases." Reports indicate that plant-based chemicals are employed in around 25% of already marketed medications.

OBJECTIVE

To analyse the effectiveness of herbal preparations for bacterial pathogens.

According to the World Health Organization, infectious illnesses are the sixth greatest cause of mortality worldwide. Human populations are under continual danger from new and resurgent infectious illnesses. Viral infections, which may be caused by both new and ancient infectious viruses, are one of the many infectious illnesses that threaten humanity's continued existence on Earth (Graham, Anderson, and Lang, 1994)3. Microorganisms' (bacteria, viruses, and parasites) resistance to conventional antimicrobial therapy has spurred renewed interest in alternative therapies, particularly those derived from herbal sources. Many plants have been researched and determined to offer therapeutic promise against potentially fatal viral infections. Many such herbal plants have been documented in the ethno-medicinal literature as having broadspectrum antiviral action. With the advent and reemergence of extremely contagious viruses, the research of the potential antiviral activity of several medicinal plants has gained a tremendous speed in the light of expanding technical techniques at disposal. "Emetine (isoquinoline alkaloid obtained from the underground part of Cephaelis ipecacuanha, and related species), used both as an amoebicidal drug and for the treatment of abscesses due to Escherichia histolytica infections", is a classic example of a lead from herbal sources that got translated into a anti-infective potential drug candidate. Quinine, a medicine produced from the bark of the Cinchona tree, has been used medicinally for a very long time (Caelli, et al., 2000)5. morphine, and taxol are Aspirin, all medications that were derived from compounds that were first extracted from plants. The antiviral effects of herbal remedies have been widely studied. The purpose of this overview is to collect and highlight data on various plant mixtures including traditional knowledge and antiviral characteristics.

METHODOLOGY

Through review of available literature on the subject

"The literature presents a sizable number of herbal plants and plant products with antiviral potential against various virus types. The vast majority of the antiviral herbs tested positive for the presence of active components such flavones, alkaloids, and polyphenols, all of which are crucial in combating viruses.

DISCUSSION OF FINDINGS

Raw Chinese medicinal components include mvlabris. wild buckwheat root. and peppermint." Bruised and inflamed skin, bug bites, and other skin conditions are all aided by this herbal remedy (insects, snakes, rabid dog). Peppermint aids in the body's natural elimination of toxins. This medication promotes urination, which aids in the elimination of the infection. This herbal remedy may be made into a pill, capsule, or tablet based on how the ingredients are processed. Preparing medicinal herbs often entails boiling the individual herbs in 50-100 cc of grain spirit for a few minutes. Erwu is a dependable and safe preparation that may be given to anybody who has been bitten by a cat or dog, regardless of whether or not the animal has rabies. For rabies prevention, a 25 ml dose must be taken daily for 5 days. Pregnant women and young children should not use this product.

There was immediate relief from waist discomfort and swelling the day after taking this herbal remedy, as well as a return to normalcy and no longer feeling terrified of the dark, the water, or the wind. No hematuria was reported on day 2. If the patient's urine is clear again after three days, it means the rabies virus has been successfully eliminated and the patient has fully recovered without any additional complications. The suggested dosage schedule for this medical preparation is three times daily for seven days, and it has been proved to be effective even in the paralysis stage of rabies. This herbal remedy is cheap, easy to produce, includes no pharmaceutical medications, is mild in property, and has no hazardous or negative effects on human physiology. The amazing healing effect of the herbal medication has been shown in clinical practise, with a reported success rate of up to 100%.

"The herbs used to make the four herb combinations range from the aeginetiaeherba and blechnirhizoma to the lespedezaeherba and polygoni-cuspidati-rhizoma and the forsythiae fructus and ligustri fructus. These combinations, acquired through particular methods, have been shown to be very successful at treating human Hepatitis B virus bearers and Hepatitis C patients. Individualized dosing for these composition herbal combinations might range from 0.4 g to 120 g daily. At least three (3) doses per day are required, with bolus administration being preferred due to its superior effectiveness. Both murine leukaemia virus (MULV) and human immunodeficiency virus (HIV) were inhibited in vitro by the herb combinations."

The southern district of Kushtia, the eastern district of Natore, and the western district of Nawabganj. Traditional medicine practitioners are relied on by the majority of the rural people Bangladesh's 64 districts. in These professionals have extensive training in the use of medicinal plants and their qualities (Gaby, 2001)11. Practitioners pass along their unique recipes and doses from generation to generation, with the knowledge being kept secret. Many similar places may be found in India's densely wooded interior.

The in vitro antibacterial efficacy of hundreds of plant extracts has been examined. The purpose of this analysis was to assess the quality of controlled clinical studies including herbal medicines that have antibacterial activity. Our criterion allowed us to include seven clinical studies. Randomization was used in four of the trials. No meaningful benefit was seen from using garlic and cinnamon to treat Helicobacter pylori infections across three separate studies (Sharquie, Al-Turfi, and Al-Salloum, 2000)6. Four studies examined treatments for skin infections caused by bacteria. An ointment made from tea leaf extract was shown to be effective against contagious cases of impetigo. Results from one study of Ocimumgratissimum oil for acne and two studies of tea tree oil mixtures for acne and methicillin-resistant Staphylococcus aureus were comparable to those from standard therapies. Despite the importance of publishing controlled clinical studies, few have been published. Thus yet, no herbal medicine's clinical effectiveness has been shown beyond a reasonable doubt. Detailed clinical investigations in this area seem warranted.

Fresh Garlic and Extracts

In a crossover study "including 12 people infected with H. pylori, the potential of extracts of fresh garlic and capsaicin-containing peppers to suppress the bacteria in vivo was examined." Three meals a day, all prepared in Mexican manner, contained the test a chemicals. There were a minimum of three trial days in which subjects participated "(negative and positive controls and one experimental ingredient). To rule out the possibility of longlasting anti-H. pylori effects, at least 2 days passed between medications, and bismuth was always the final intervention investigated (Nir, Potasman, Stermer, Tabak, and Neeman, 2000)4. Ten freshly sliced cloves of garlic, six freshly sliced jalapeo peppers, two tablets of bismuth subsalicylate (Pepto-Bismol, positive control)", or no additives were given to participants at any given meal throughout the test period (negative control). Before each day's first meal, dinner, and morning following test day, participants took a urea breath test. The outcomes were analysed to determine the therapy' efficacy. Bismuth was given to 11 participants, garlic to 10, and jalapeos to 6. "Ingesting garlic or jalapenos had no influence on urease levels (median urease activity before and after garlic, 28.5 compared 39.8, and after jalapenos, 43.7 versus 46.6; P > 0.8), whereas taking bismuth resulted in a significant decrease (55.8 versus 14.3; P 0.001). Two patients reported severe nausea and diarrhoea after eating the jalapenos, and seventy percent of those who ate garlic noted a change in

flavour and an unpleasant odour (Harris and Misiewicz, (2001)12. The absence of randomization and the relatively small sample size were problems for this research."

Cinnamon Extracts

"Twenty-three patients who were having gastroscopy and had a positive urea breath test were studied by Nir et al.4 to determine the effects of therapy with an extract of cinnamon (Cinnamonum cassia)." A total of 32 patients were split evenly between the research and control groups, although only 23 were ultimately counted. Fifteen people took 80 mg of cinnamon daily for four weeks, whereas eight people took a placebo. At the conclusion of the trial period, breathalyser tests were performed again. Both the pre- and postcinnamon treatment groups exhibited increases and decreases in urea breath test values, "however there were no statistically significant differences between the two groups in the mean values (22.1 vs. 24.4, 23.9 vs. 24.9)." While this study was well planned, its small sample size makes it impossible to rule out the potential of a type II error.

Recurrent Infections and Use of Self Medication

Infections caused by Staphylococcus aureus and Streptococcus pyogenes

When it comes to killing off methicillinresistant Staphylococcus aureus, one research experiment evaluated the efficacy of a combination of 4% tea tree oil (TTO) nasal ointment and 5% TTO body wash (intervention) to that of 2% mupirocin nasal ointment and triclosan body wash (routine) (MRSA).

Thirty in-patients with MRSA infections or colonisations were enrolled and randomly randomised to receive either "TTO or regular routine treatment for a minimum of three days. Patients who tested positive for MRSA received intravenous vancomycin, and all participants were retested for MRSA carriage 48 and 96 hours after topical therapy was discontinued." Eighteen patients dropped out before the experiment was completed. The intervention group had a higher rate of successful infection resolution (5/8) than the control group (2/10). After 34 days of therapy, one of two patients in the intervention group was cured of infection while the other was left chronically colonised. We found no statistically significant differences between the groups. Because of the limited sample size, no significant findings can be drawn from this experiment.

Clinical trials were conducted on 104 individuals with contagious impetigo, after in vitro testing of the antibacterial activity of crude preparations of black tea (Thea assamica). At least thrice daily, those in Group 1 used a lotion containing 1% tea extracts in an aqueous solution, whereas those in Group 2 applied a lotion containing 5% tea extracts in a vaseline base. Comparisons were made between the success rates of these groups and those of groups treated with framycetin and gramicidin ointment (Group 3) or oral cefalixin (Group 4). Similar success rates to antibiotics were seen with the 5% tea extract (81.3%, 72.2%, and 78.6% for Groups 2-4). For those in Group1, the percentage of recovery was 37.5 percent. Although the experiment as a whole may appear substantial, the actual number of patients in each therapy group was rather small. The lack of randomization in this trial was also problematic.

Trials on Herbal Medications

The number of rigorous scientific studies conducted on natural antibiotics is quite low. It's remarkable that so few studies have examined the effectiveness of herbal antibiotics, given their lengthy history and current popularity. Perhaps the most glaring is that herbal remedies cannot be patented. Traditional herbal medicine may also be slow to adopt new techniques of scientific evaluation of their effectiveness.

Studies on herbal medicines are not always published in publications that may be easily accessed by computerised databases, and occasionally negative trials are not even reported. As cranberry extracts have been used to treat UTIs for decades, it seems likely that clinical research including their usage would exist. While many studies have looked at cranberry for preventing urinary tract infections,9 there are no published clinical trials of its use for treatment of infections,10 therefore it was not included in this review.

Almost all of the clinical studies that were sought out had a small number of participants. Two trials found that herbal treatments were just as effective as standard care, while a third study found that one of two herbal formulations used was just as effective as two standard antibiotic regimens. A topical oil formulation of O. gratissimum showed promise in reducing acne severity, according to the findings. It had the same efficacy as benzoyl peroxide, but its disagreeable odour meant that patients may not find it as appealing.

Even in the absence of symptoms, H. pylori infection is prevalent and has been linked to an increased risk of stomach cancer. Conventional antibiotic therapy may not be sufficient for complete eradication of the bacterium; combinations of antibiotics, proton pump inhibitors, and bismuth preparations may be necessary. Moreover, traditional therapies can come with side effects.

The therapeutic properties of garlic have been studied more than those of any other plant. Allicin is essential for its antibacterial activities, which are assumed to arise from a combination of inhibitory effects on several thiol-dependent enzyme systems. It is the enzyme allicinase that catalyses the formation of allicin when raw garlic is crushed or when dried garlic is rehydrated with water. Methyl and allyl sulphides of allicin are extracted from mashed garlic using steam distillation to create garlic oil, which is more stable than allicin itself.

Nir et al. were prompted to perform a clinical experiment since cinnamon extracts inhibited the development and urease activity of many H. pylori strains in vitro. While the extract was unsuccessful in vivo at the dosage used, the scientists speculated that greater cinnamon concentrations or a regimen combining antibiotic and herbal treatment could be able to eradicate the organism.

Finally, the research presented here implies that certain herbal treatments with antibacterial activity may be beneficial. More definitive confirmation of their effectiveness is necessary, hence larger, better-designed clinical studies are needed.

CONCLUSION

The immune system is bolstered by herbal remedies because of their comprehensive approach, which may aid the body in its battle against invading pathogenic pathogens. In the face of rising resistance to antiviral medication treatment, herbal antiviral substances are emerging as an attractive option. There are several effective and safe herbal therapies for viral disorders that have advanced clinical trial confirmation. While herbal remedies have been used for centuries, there is still more research to be done to find the most effective therapies, dosages, and formulations. Several sections of the globe rely heavily on herbal plant medicines, either alone or in various combinations, yet there is a lack of information about the interactions between these plants and the human body. Thus, conventional treatment should be combined with scientific study to development speed up the of new pharmaceuticals based on phytochemicals. Researchers and policymakers need access to accurate information on the pharmacokinetics and pharmacodynamics of medicinal herbs and their preparations before they can develop and implement large-scale, randomised, multicenter clinical studies. Incorporating and applying a specific herbal formulation into standard treatment may become a reality via the use of such methods.

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