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Phytomedicines as potent alternative Anti-microbial naturopathic treatment in Chronic Communicable diseases: A Review

Zahida Shah*, Sabeeha Shafi, Tabasum Ali

Department of Pharmaceutical Sciences, School of Applied Sciences and Technology, University of Kashmir, Hazratbal, Srinagar-190006, India.

ABSTRACT

Communicable Diseases are caused by various opportunistic pathogenic micro-organisms that pose a serious health threat to the health of human beings. The contagious diseases are spread by various pathogenic micro-organisms like bacteria, viruses, fungi, bacteria or Protozoa through various mediums like air, blood, feces or through other blood fluids etc. Malaria, Respiratory disorders, fever, Measles, athletes foot, rabies are some common examples of these diseases. Allopathic management of these diseases by synthetic drugs pose serious health threats like multi-drug resistance. Phytomedicines are considered the safest alternative sources of treatment to overcome the multi-drug resistance as the important phytoconstituents present in phytomedicines like alkaloids, flavonoids, phenols are known since time immemorial for their alleviation in chronic diseases like Cancer, Diabetes etc.

Keywords: Communicable Diseases, Multi-Drug Resistance, Phytomedicines, Phytoconstituents, Chronic Diseases.

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***Address for Correspondence:**

Zahida Shah, Department of Pharmaceutical Sciences, School of Applied Sciences and Technology, University of Kashmir, Hazratbal, Srinagar-190006, India.

INTRODUCTION

Communicable diseases are caused by various micro-organisms. The most common causes of death in emergencies and disasters are acute respiratory infection, measles, malnutrition and, in endemic zones, malaria. Every year communicable diseases kill more than 14 million people throughout the world, predominantly in developing countries.1 At present, measles, pertussis and tetanus, diseases that affect children, are responsible for the majority of disability-adjusted life years lost. Measles accounts for 30 million cases and 888 000 deaths worldwide annually. Synthetic drugs like antibiotics used for the managementt of these chronic diseases pose serious problems like Multi-drug resistance. Phytomedicines are considered the safest alternative sources of treatment to overcome the multi-drug resistance as the important phytoconstituents present in phytomedicines like alkaloids, flavonoids, phenols are known since time immemorial for their alleviation in chronic diseases like Cancer, Diabetes etc.

Antimicrobial substances of natural, semisynthetic or synthetic origin that kills or inhibits the growth of microorganisms but causes little or no damage to the host. Antimicrobial medicines can be grouped according to the microorganisms they act primarily against. For example, antibacterials (commonly known as antibiotics) are used against bacteria and antifungals are used against fungi. They can also be classed according to their function. Antimicrobials that kill microbes are called microbicidal; those that merely inhibit their growth are called microbiostatic. Disinfectants antimicrobial substances used on nonliving objects or outside the body.

The history of antimicrobial begins with the observation of Pasteur and Joubert, who discovered that one type of bacteria could prevent the growth of another. They did not know at that time that the reason one bacterium failed to grow was that the other bacterium was producing an antibiotic. Technically antibiotics are only those substances that are produced by one microorganism that kill or prevent the growth of another microorganism. Of course, in today's common usage, the term antibiotic is used to refer to almost any drug that attempts to rid your body of a bacterial infection. Antimicrobials include not just antibiotics, but synthetically formed compounds as well.

The discovery of antimicrobials like penicillin and tetracycline paved the way for better health for millions around the world. Before penicillin became a viable medical treatment in the early 1940s, no true cure for gonorrhea, strep throat and pneumonia existed. Patients with infected wounds often had a wounded limb removed or face death from infection. Now, most of these infections can be cured easily with a short course of antimicrobials.

However with the development of antimicrobials, microorganisms have adapted and become resistant to previous antimicrobial agents. The old antimicrobials technology was based either on poisons or heavy metals, which may not have killed the microbe completely, allowing the microbe to survive, change and become resistant to the poisons and /or heavy metals.

Antimicrobial nanotechnology is a recent addition to fight against disease causing organisms, replacing heavy metals and toxins and may someday be a viable alternative. Infections that are acquired during a hospital visit are called hospital acquired infections or nosocomial infections. Similarly when the infectious disease is picked up in the non hospital setting it is considered "community acquired."

There are mainly two classes of antimicrobial drugs.

1. Those obtained from natural sources.

- Beta lactam antibiotic (such as penicillins, Cephalosporins)
- Protein synthesis inhibitors (such as aminoglycosides, macrolides, tetracycline, chloramphenicol polypeptides)

2. Synthetic agents

- Sulphonamides
- Anti virals
- Anti fungals
- Anti cancer drugs
- Anti malarials
- Anti tuberculosis drugs
- Antileprotics and Anti protozoals

The potential for developing antimicrobials from higher plants appear rewarding as it will lead to the development of a phytomedicine to act against microbes; as a result, plants are one of the bedrocks for modern medicine to attain new principles[1]. Plant based antimicrobials represent a vast untapped source of medicine. Plant based antimicrobials have enormous therapeutic potential as they can serve the purpose without any side effects that are often associated with synthetic antimicrobials. Further continued exploration of plant derived antimicrobials is needed today[2].

Scientific experiments on the antimicrobial properties of plant components were first documented in the late 19th century.[3] It is estimated that today, plant materials are present in, or have provided the models for 50% Western drugs.[4] Many commercially proven drugs used in modern medicine were initially used in crude form in traditional or folk healing practices, or for other purposes that suggested potentially useful biological activity. The primary benefits of using plant derived medicines are that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits and more affordable treatment.

The medicinal plants around the world contain many compounds with antibacterial activity.[5] Many efforts have been made to discover new antimicrobial compounds from various sources such as microorganisms, animals, and plants. Systematic screening of them may result in the discovery of novel effective antimicrobial compounds. The use of botanical medicines is generally on the rise in many parts of the world.[6] The screening of plant extracts and plant products for antimicrobial activity has shown that plants represent a potential source of new anti-infective agents.[7,8,9] Numerous experiments have been carried out to screen natural products for antimicrobial property.[10,11,12] Considering the above, it can be stated that plants are valuable sources for new compounds and should receive special attention in research strategies to develop new antimicrobials urgently required in the near future.[13,14]

CONCLUSION

The current review provides a detailed and comprehensive detail on the emphasis of Phytomedicines in chronic diseases to overcome the serious problems posed by the synthetic antimicrobial agents.

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