Invitro-Antimicrobial Activity of Shirish Twak (Albizia lebbeck)

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A B S T R A C T

Staphylococcus aureus is primary pathogen of humans and also of animals, and its infections are found throughout the world. It causes many clinical conditions such as skin infections, pyogenic infections and systemic infections like bacteremia, osteomyelitis, septic arthritis, endocarditis, pneumonia, meningitis, deep seated abscess, and also toxin mediated infections like food poisoning, toxic shock syndrome, staphylococcal scalded skin syndrome. Human cases and carriers are reservoir of this infection. This bacterium has penicillin and methicillin resistance. 7.7 million deaths around the world were found linked to bacterial infection. That is 13.6%, or 1 in 8, of all global deaths. This makes bacterial infections the second leading cause of death globally. There are large differences in burden as well as distribution of bacterial pathogens across regions. As there is no effective immunization with toxoids or bacterial vaccines against S.aureus. The drug Shirish (Albezia lebbeck) is coated as superior amongst all anti-poisons drugs by Acharya Charaka, Shirish is having properties like Vishagna, Kandughna, Kshtaghna, Charmarogahara, Varnya karma, and having chemical compositions like saponins, tannins, d-catechin, d-leucocyanidin, friedelan-3-one and y-sitosterol and these possess antioxidant anti-inflammatory, anti-allergic actions. So, this drug is selected for study.

Key words: Staphylococcus aureus (S. aureus), Shirisha, Albezia lebbeck, Antibiotic resistance, Vishaghna.

INTRODUCTION

Staphylococcus aureus is one of the leading pathogens for deaths associated with antimicrobial resistance and the emergence of antibiotic resistance strain such as methicillin resistant, penicillin resistant. S. aureus is a worldwide problem in clinical medicine, till now no vaccine for S.aureus has been approved.

It causes skin as well as upper respiratory tract infection, the skin infections like pimples, impetigo, boils, cellulitis, folliculitis, carbuncle and toxin mediated diseases like food poisoning, toxic shock syndrome, scalded skin syndrome and abscess wound infection following the surgery.[1] Complications like bacterial pneumonia, septicemia, arthritis, meningitis etc S. aureus strain these bacteria have resistance to antibiotics and re-occurrence rate is also very high.

As there is no permanent solution for S.aureus bacterial infection its need of hour to search effective and safe treatment. Hence the study is taken up to know the efficacy of Shirisha Twak in Staphylococcus aureus bacteria. As Shirisha is having properties like Tiktha, Kashaya, Madhura Rasa, Katu-Vipaka, and having Vishaghna, Kushtaghna, Charma Rogahara, Kandughna, Varnya, Vrunahara, Shothahara[2] properties, and chemical composition like saponins, tannins, d-catechin, d-leucocyanidin, friedelan-3-one and y-sitosterol and these possess antioxidant anti-inflammatory, anti-allergic so this drug is selected.[3]

AIM AND OBJECTIVES

1. To study in detail about the drug Shirisha.
2. To know the effect of Shirisha Twak action against microbes; mainly on Staphylococcus aureus
MATERIALS AND METHODS

- Collection of Shirish Twak from authenticated source and identified by the expert.
- Collection of sample collection of secretion/flakes from affected part of skin and to isolate the Staphylococcus aureus.
- Preparation of extract out of stem bark of Shirish drug by using 35ml alcohol and 15ml water.
- In vitro Antibacterial activity will be conducted by using Agar cup method. Biocidal activity will be carried. The bacterial activity of the extracts is determined by using the agar well diffusion technique. Mueller-Hinton agar plates were seeded with 0.1 ml of overnight culture of Staphylococcus aureus, Escherichia coli respectively, allowed to incubate for 24 hours. Cups were made in Petri plate using sterile cork borer (0.85 cm) and different concentrations of the extract is added into each well. Then bacterial plates were incubated at 37°C for 24 hours.
- Each test compound has got six bores which corresponds to 6 concentrations that is 100, 75, 50, 25, 10, 5 for which zone of inhibition diameter and mean values are determined and recorded as diameter in mm.
Antimicrobial Activity Study Report

RESULTS

The drug Shirish Twak extract at 100mg concentration has shown maximum inhibition of 17mm and for 75mg and 50mg concentration 13mm inhibition against Staphylococcus aureus bacteria.

In addition to the research project, same sample was studied for Escherichia coli; but drug has not shown any inhibition against Escherichia coli.

DISCUSSION

This study revealed that the bark extract of Albizia lebbeck possesses significant antimicrobial activity against Staphylococcus aureus. It implies that bark extract could be used in the wide range of S.aureus infections. In this microbial study observed that the bark extract of Albezia lebbeck had no inhibitory action on Escherichia coli. Staphylococci are primary pathogens of humans and animals.

Staphylococcal infections are found throughout the world and one-third of the adult population is asymptomatic carrier and may cause many nosocomial infections during health care service. S. aureus doesn’t lead lifelong immunity. Hence, causes repeated infections in susceptible hosts.

Shirish is having the properties of Tikta, Kashaya, Madhura, Katu Rasa Laghu, Tikshna and Ruksha Guna, Katu Vipaka, Tridosha Shamaka, Vishagna, Kandugna, Kusthagna, Shothahara Vedanasthapana, predominantly pertaining the action against S.aureus and also contains high catechins in the form of flavonoids might reduce the inflammatory response by inhibiting the degradation of Ach (anti cholinergic). The major phytochemicals like alkaloids, flavonoids, saponins present in the stem bark of Albezia lebbeck significantly inhibits the activity of S.aures bacteria.

CONCLUSION

The Staphylococcus aureus is a gram positive staphylococcus geneus bacteria, most importantly causes a spectrum of clinical diseases. The Shirish (Albezia lebbeck) Twak is having the major phytochemicals like alkaloids, flavonoids saponins etc. helps to significantly inhibit the activity of S.aures bacteria. As the drug Shirish is abundantly and easily available, cost effective, have many simple formulations, can be used both internal and external on human body. In this microbial study Shirish Twak extract at 100mg concentration has shown maximum inhibition of 17mm. Shirish Twak extract at 75mg and 50mg concentration shows 13mm inhibition against Staphylococcus aureus bacteria.

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