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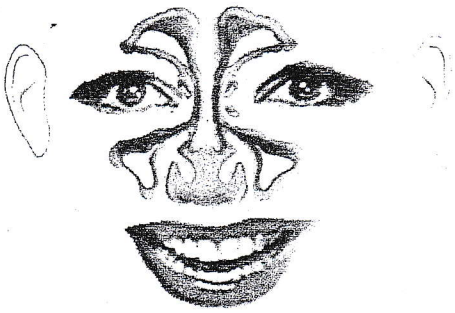

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EVALUATION OF THE ANTIBACTERIAL ACTIVITY OF KALAKA CHOORNA - AN EXPERIMENTAL STUDY

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ABSTRACT

Kalaka choorna is one of the best medicines used to treat mukharoga, dantaroga and galaroga. This formulation has been used specially as a local treatment. *Staphylococcus aureus* and *Streptococcus pyogenus* are main causative organisms of tonsillitis. The present study was designed to determine the antibacterial activity of Kalaka choorna using agar well diffusion method in comparison with standard antibiotic Amoxicillin against the *Staphylococcus aureus* (ATCC 25923) and *Streptococcus pyogenus* (clinical isolate). The samples of kavala were prepared as two kind of decoction (4:1 and 6:1), Amoxicillin as positive control and triplicates were made for each test. Observation was recorded by measuring the diameter of the inhibitory zones surrounding the discs. According to the results inhibitory effect of 6:1 sample was significant for *Staphylococcus aureus* and *Streptococcus pyogenus*. According to the results inhibitory effect of two samples in different concentrated levels, it is concluded that Kalaka choorna has an antibacterial activity as a kavala and it was not dependent on the concentration level of the decoction. And also it was confirmed that the paribhasha of kavala or gandoosha is authentic. The present study of the antibacterial activity of Kalaka choorna forms a primary platform for further phytochemical and pharmacological studies to discover new antibiotics.

Key words: Kalaka choorna, kavala, paribhasha, gandoosha

INTRODUCTION

Oral cavity is one of the nine openings of physical body according to Ayurveda. These openings are openings to impurities since various body secretions pass through them day and night. So Ayurveda suggest cleansing them frequently and regularly. Regarding oral cavity, daily regimen of Ayurveda insist brushing the teeth (danta dhavana) tongue scraping (jihwanirlekhana) gargling (gandoosha and kavala graha) chewing betel (tambula sevana) and cleaning the face (mukha prakshalana).

Among the measures to keep oral health, gandoosha and kavala graha are of added importance. This is also also used to treat various diseases of oral cavity and systemic diseases in Ayurveda. Tonsillitis is a disease which can by use kavala as a local treatment. Tonsillitis refers to inflammation of the pharyngeal tonsils. The inflammation may involve other areas of the back of the throat, including the adenoids and the lingual tonsils

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(tonsil tissue at the back of the tongue). There are several variations of tonsillitis: acute, recurrent, and chronic tonsillitis. Viral or bacterial infections and immunologic factors lead to tonsillitis and its complications. Due to improvements in medical and surgical treatments, complications associated with tonsillitis, including mortality, are rare.

The herpes simplex virus, *Streptococcus pyogenes* (GABHS), Epstein-Barr virus (EBV), cytomegalovirus, adenovirus, and the measles virus cause most cases of acute pharyngitis and acute tonsillitis. Bacteria cause 15-30 percent of pharyngotonsillitis cases; GABHS is the cause for most bacterial tonsillitis. (i.e. strep throat).

Kalaka choorna is one of the best medicines used to treat mukharoga, dantaroga, galaroga and specially tonsillitis. Kalaka choorna is used as a kavala in tonsillitis. The medicine must be gargling, up till phlegm collects in mouth or there is lacrimation, and then spat out. Ayurveda prescribes this treatment in conditions such as headache, all oral cavity disorders, excessive salivation, ear infections, nausea and tastelessness. Regular use can achieve improved voice quality, strength to jaws; improve strength of facial muscles, improved taste perception, strong and healthy teeth and immunity against diseases. The present study was designed to determine the antibacterial activity of Kalaka choorna using agar well diffusion method in comparison with standard antibiotic Amoxicillin against the *Staphylococcus aureus* (ATCC 25923) and *Streptococcus pyogenus* (clinical isolate).

METHODOLOGY

Kalaka Choorna has mentioned in Ashtanga Hrdaya as a treatments for diseases of the mouth, teeth, and throat.(Ast.Hr.Utt.22/99).It was prepared according to choorna paribhasha (Sha: San: Madyama: 6/1).

Ingredients: *Piper longum* (Pippali), *Piper nigrum* (Maricha), *Zingiber officinale* (Shunti), *Phyllanthus emblica* (Amalaki), *Terminalia chebula* (Harithaki), *Terminalia bellirica* (Vibhithaki), *Aquilaria agallocha* (Agaru), *Piper chavya* (Chavya), *Cissampelos pareira* (Patah), *Plumbago indica* (Chitraka), Yawakara lunu, Viyandubulu, Rasanjana.

The powder has been prepared using above ingredients. Then two decoctions were prepared which can be used as kavala.

Sample I: decoction prepared using 6 parts of water and boiled into 1 part. (6:1)

Sample II: decoction prepared using 4 parts of water and boiled into 1 part. (4:1)

The antibacterial activity of each samples were tested against *Staphylococcus aureus* (ATCC 25923) and *Streptococcus pyogenes* (clinical isolate) using the agar well diffusion method. Organisms were inoculated into nutrient broth and incubated at 37°C for 18 hours. The culture medium was inoculated using above bacterial suspensions in nutrient broth. The inoculum was spread over the Muller –Hinton agar plate using a sterile cotton swab in order to get a uniform microbial growth. Turbidity of inoculum was matched with McFarland turbidity standard. The diameter of a well was 5mm and had a height of 4mm. Four wells were cut in the agar surface with the help of a cork borer. Two wells were filled with 50µl of the prepared decoctions of Sample I (6:1) and Sample II (4:1) A. Amoxicillin (10mg/1ml in sterile distal water) was used as the positive control and sterile distilled water was used as the negative control. Triplicates were made for each test respectively. All the plates were incubated at 37°C for 24 hours and the antibacterial activity was evaluated by measuring the diameter of inhibition zone. Any zone of inhibition around the decoction containing wells was considered as sensitive.

RESULTS

The details of zone of inhibition measured for various samples are presented.

Organism	Standard	Sample I(6:1)	Sample II(4:1)	Positive control (Amoxicillin)
Staphylococcus aureus (ATCC 25923)	31.5±2.5mm	12±1.41mm	10±1.41mm	29±3.40mm
Streptococcus pyogenes	30.93±2.9mm	11±1.05mm	9.5±1.05mm	26±3.40mm

All three samples exhibited antibacterial activity against both organisms studied. However, the activity of positive control was found to be superior to other samples against *Staphylococcus aureus* (ATCC 25923) and *Streptococcus pyogenes* (clinical isolate). (Figures No. 8 & 9)

DISCUSSION

The results revealed that the decoction displayed inhibitory zones against both organisms. The positive control of Amoxicillin showed 29±3.40mm for *Staphylococcus aureus* and 26±3.40mm for *Streptococcus pyogenes* while Sample I (6:1) showed 12±1.41mm and 11±1.05mm diameters respectively. The zones of inhibition obtained were recorded 10±1.41mm for *Staphylococcus aureus* and 9.5±1.05mm for *Streptococcus pyogenes* for Sample II (4:1).

Commonly antibiotics are used as broad spectrum. Any antibiotic (positive control - Amoxicillin) could be damaged the commensal micro flora of intestines. Though the decoctions of Kalaka choorna showed less inhibition zones than the positive control, constant usage of kavala could be more effective clinically. Also, 120ml is used once as kavala and here, to test the antibacterial activity only 50µl has been used. So proper dosage should be used to get effective relief from tonsillitis.

More than that, as a affordable and harmless herbal treatment modality kavala using Kalaka choorna will be more effective than allopathic medicine.

CONCLUSION

According to the results inhibitory effect of two samples in different concentrated levels, it is concluded that Kalaka choorna has an antibacterial activity as a kavala and it was not dependent on the concentration level of the decoction. And also it was confirmed that the paribhasha of kavala / gandoosha is authentic. The present study of the antibacterial activity of Kalaka choorna forms a primary platform for further phytochemical and pharmacological studies to discover new antibiotics.

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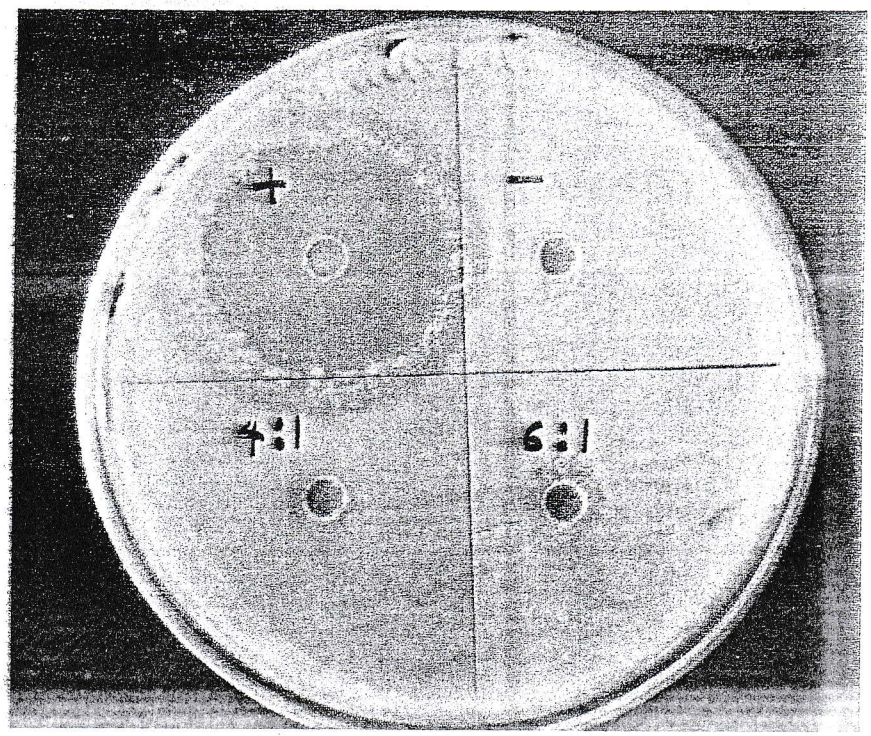

Figure No. 8: Inhibition zone of *Staphylococcus aureus*

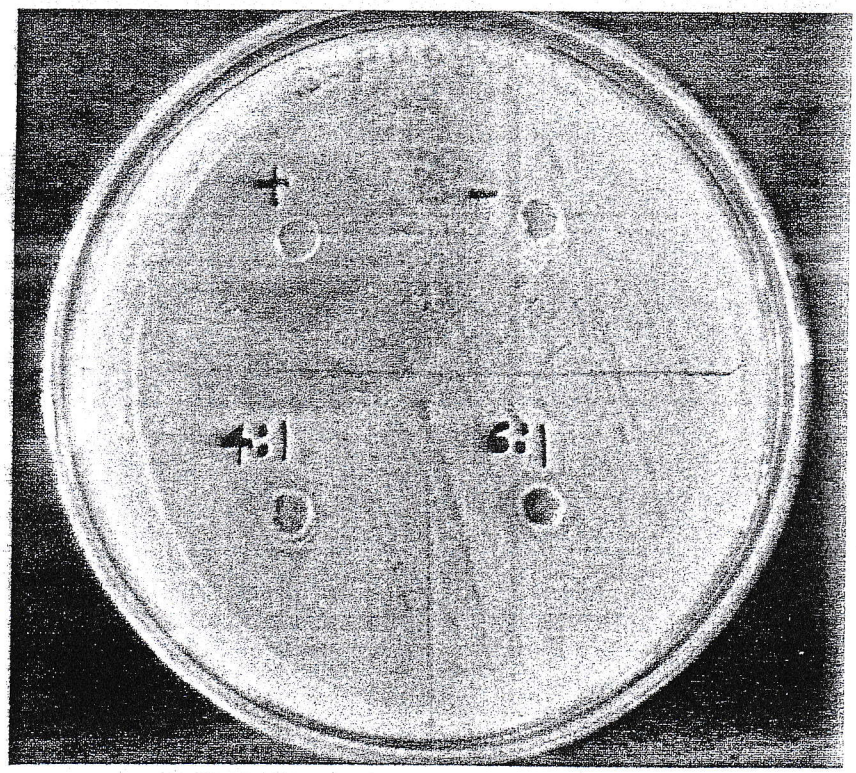

Figure No. 9: Inhibition zone of *Streptococcus pyogenes*