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ANTI-MICROBIAL ASSAY OF AYUSHSIDDHA HERBO-MINERAL FORMULATION AGAINST NOSOCOMIAL INFECTION

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ABSTRACT

Nosocomial infection by pathogenic bacteria such as Staphylococcus aureus, Streptococcus pneumonia, Klebsiella pneumonia and Escherichia coli deserve special attention in hospital environment because of their frequency and because they are caused by strains resistant to various antibiotics. The aim of the present study is to screen In-vitro Anti-microbial activity of Ayush Siddha formulation against human pathogenic micro organism causing nosocomial infection.

KEY WORDS: Ayush Siddha formulation,Anti microbial assay,Nosocomial infection.

INTRODUCTION

Siddha Yoga, the ancient science of Indiawhich includes the concept of achieving physical and mental fitness.For achieving physical fitness,theprinciple of -"Food as Medicine and Medicine as Food"- is treated as one of the important methods or disciplines of siddha yoga. Luxuries of modern world has brought many comforts in the life of human being,but it has also inevitable bought nosocomial infections owing to changed environmental condition.

UNIQUENESS OF SIDDHA MEDICINE

Siddha medicine are effective in the treatment of infectious disease.Though the availability of all the synthetic resources are peaking at alarming rate,Siddha system of medicine doesnot depends on large scale of production of chemicals for sustainability of healthy living .

ROLE OF SIDDHA MEDICINAL AQUEOUS EXTRACT IN ANTIMICROBIAL ASSAY

In Modern medicine ,treatmentof Nosocomial infection is given on the basis of sensitivity testing. Antimicrobial agents are used for the treatment. Since from Ancient times, Siddha medicine have provided a good source of antimicrobial agents.

According to the Modern researcher's results,

"An organic solvent is better and may be more beneficial .The aqueous extract appears to have less antibacterial activity than the methanolic extract".

But it is interesting that,Ancient Siddha traditional method of treating a bacterial infection was by administering a decoction of the plant or a part there of by boiling it in water(aqueous form) or in fine nano particles powder form.Thus,Siddha system of medicine doesnot depends on large scale of production of synthetic chemicals for drug manufacturing. Hence, inorder to show the uniqueness and potentiality of Siddha formulations,this study is conducted on aqueous extract.

MATERIALS AND METHODS

Method of preparation of Test samples:

Test samples used in this present study are Ayush Siddha formulation namely,Parangipattailegium,Kalarchivithaipodi,Methichooranam,Madhurigaichooranam and Gunma kudorimelugu which are prepared as per Siddha Materia Medical procedure.

Preparation of extract of Test samples:

Aqueous Extraction:

Ingredients of test samples were purified,air dried and then homogenised to fine powder and stored in airtight bottles as per Siddha Materia Medical procedures.For aqueous extraction,10 gm of air-dried powder was placed in distilled water and boiled for 6 hours.At intervals of 2 hours it was filtered through 8 layers of muslin cloth and centrifuged at 5000 x g for 15 min.The supernatant was collected.After 6 hours,the supernatant was concentrated to make the final volume one-fourth of the original volume.Finally 10g of material was extracted in 25 ml of distilled water giving a concentration of 40mg/0.1ml.It was then autoclaved at 121^{o}C and 15 Ibs pressure and stored at 4^{o}C.

Disc Diffusion Method

Kirby-Bauer Disc Diffusion Method:It is a simple and reliable method applicable in routine clinical bacteriology

Principle:

The placing of a filter paper disc (measured 6mm in diameter) containing known amount of an antimicrobial agent on the agar surface previously inoculated with bacterium to be tested will result in zone of inhibition of growth around the disc.

Requirements

CultureMediaused: Muller-Hinton Agar Media (M173).

Test Micro organisms:

The microbial strains are identified strains and were obtained from the Malar Micro Diagnostic Center,Tamilnadu,India and maintained in the laboratory by periodic subculture.The pathogenic bacterial strains studied are Streptococcus pneumonia,Escherichia coli,Klebsiella pneumonia,Staphylococcus aureus.

Inoculum of test bacterium used in a suitable broth medium (Peptone water)

For preparation of inoculum,pure culture of the test micro organisms are inoculated into a broth medium and incubated at 37^{o}C for 2-4 hours.

Procedure :

- A loop full of the strain was inoculated in 30 ml of nutrient broth in a conical flask and incubated on a rotary shaker for 24 h to activate the strain.Muller Hinton Agar (M 173) was prepared for the study.The assay was performed using Agar disk diffusion for aqueous extract.The media and the test bacterial cultures were poured into Petri dishes(Hi-Media).
- The test strain (0.2 ml) was inoculated into the media (inoculum size 108 cells/ml) when the temperature reached 40-42^{o}C.Care was taken to ensure proper homogenisation.The experiment was performed under strict aseptic conditions.For the Agar disk diffusion method,the test compound (0.1ml) was introduced onto the disk(0.7cm)(Hi-Media)and then allowed to dry.Thus the disk was completely saturated with the test compound.Then the disk was introduced onto the upper layer of the medium with the bacteria.The plates were incubated overnight at 37^{o}C.
- Microbial growth was determined by measuring the diameter of the zone of inhibition.Distilled water was used as the control.The control activity was deducted from the test and the result obtained was plotted.The antibacterial activity of Siddha formulations extract of aqueous solvents against selected pathogenic bacterial strains were screened.
- A standard control Amikacin is also tested for comparison.The zone of inhibition was measured with the scale from the centre of disc to the clear zone in millimetre and the results were recorded.

- The plates are incubated at 37^{o}C for 16-18 hours and susceptibility is determined on the basis of zone of inhibition.

RESULTS AND DISCUSSION:

The results of In vitro anti-microbial assay indicates that aqueous extract of test samples showed more anti-bacterial activity against human pathogenic micro organisms responsible for nosocomial infection,with the standard control Amikacin for comparison. Results were expressed in table and Figure :

Test sample Siddha formulations	**Test pathogenic Micro organism strains**	**ZOI of test samples**	**ZOI of Amikacin**
Parangipattailegium	Escherichia coli	10mm	12mm
Kalarchivithaipodi	Streptococcus pneumonia	08mm	11mm
Gunma kudorimelugu	Escherichia coli Klebsiella pneumonia	19mm 15mm	22mm 16mm
Methichooranam	Klebsiella pneumonia	08mm	10mm
Madhurigaichooranam	Escherichia coli Staphylococcus aureus	08mm 18mm	12mm 20mm

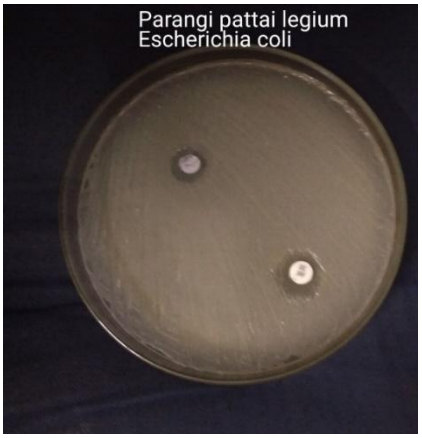

Figure 1: Aqueous extract of Test sample of siddha formulation Parangipattailegium revealed that test sample showed antimicrobial sensitivity against Nosocomial infections causing human pathogens especially Escherichia coli with ZOI 10mm .

Figure 2: Aqueous extract of Test sample siddha formulation- Gunma KudoriMelugu revealed that test sample showed antimicrobial sensitivity against Nosocomial infections causing human pathogens especially Escherichia coli.andKlebsiella pneumonia with ZOI 19mm and 15mm respectively.

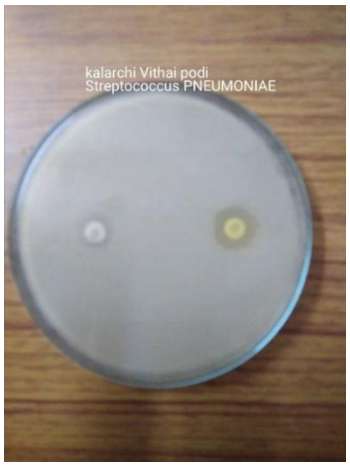

Figure3:Aqueous extract of Test sample siddha formulation- Kalarchivithaipodi revealed that test sample showed antimicrobial sensitivity against Nosocomial infections causing human pathogens especially , Streptococcus pneumoniae with ZOI 8mm .

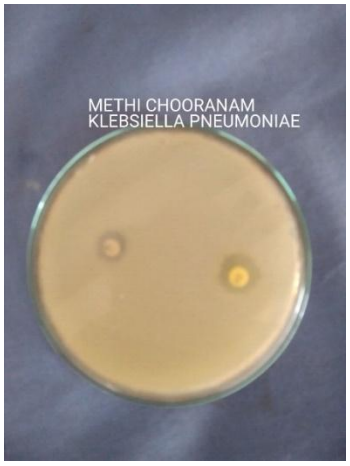

Figure 4:Aqueous extract of Test sample siddha formulation-Methichooranam revealed that test sample showed antimicrobial sensitivity against Nosocomial infections causing human pathogens especially , Klebsiella pneumonia with ZOI 8mm.

Figure 5: Aqueous extract of Test sample siddha formulation-Madhurigaichooranam revealed that test sample showed antimicrobial sensitivity against Nosocomial infections causing human pathogens especially,Escherichia coli and Staphylococcus aureus with ZOI 08mm and18mm respectively.

Aqueous extract of Test samples were subjected to anti-microbial studies.This study revealed that test samples of siddha formulations can be prescribed to Nosocomial infections due toStaphylococcus aureus,Streptococcuspneumoniae,Klebsiella pneumonia and Escherichia coli which deserve special attention in hospital environment .The efficacy of Siddha formulation against bacterial strains included in this study which will encourage the young researchers to carryout further research.

CONCLUSION

Test samples of Siddha formulation showed maximum antibacterial activity and so these Siddha medicine can serve as leads for the development of new antimicrobials against nosocomial infection that address hither to unmet therapeutic needs.Such screening of various Siddha formulations and identifying successful prediction of active antimicrobial agents is the need of the hour and it will pay off later in effective Ayush Siddha drug development.From this study result,it is concluded that the above Siddha formulations can be prescribed as the medicine for nosocomial infections due to pathogenic strains of Staphylococcus aureus,Streptococcuspneumonia,Klebsiella pneumonia and Escherichia coli.

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