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Comparative Study to Analyse the Efficacy of Homoeopathic and Allopathic Medicine on *Staphylococcus aureus* Isolated from Clinical Specimen

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ABSTRACT

Objective: The objective of the present study was to analyse the efficacy of Homoeopathic and Allopathic medicines on Staphylococcus aureus isolated from clinical specimen.

Methodology: The present study was conducted at the Institute of Microbiology, University of Sindh, Jamshoro, Sindh, Pakistan. After collecting the samples from infected blood serum, the same were cultivated through streak plate method. On the next day, the yellow brownish colonies were appeared and in order to confirm the bacterial species, microscopic and biochemical identification tests were performed. Subsequently, after confirmation of the Staphylococcus aureus, the Antibiotic Susceptibility test was performed to analyse the efficacy of different medicines.

Results: The findings of the present study indicate that the homoeopathic medicines (BELLADONNA 200c, ARNICA 200c, NUX VOMICA 200c, SULPHUR 200c and BERBERIS VULGARIS 200c) inhibit the growth of bacterium from clinical specimen similar to the allopathic medicines. We specifically analysed the effect of six homoeopathic medicines named as ARNICA, BELLDONNA, BURBERIS, CALENDULLA, SULPHUR and NUX VOMICA. Although, the Allopathic medicines inhibit the growth of disease causing bacterium, such medicine weaken the immunity system and are considered as a major cause of producing antibiotic resistant microorganisms.

Conclusion: In the present study we tried to explore the efficacy of allopathic medicines on pathogenic Staphylococcus aureus species in parallel with selected antibiotics. The study concluded that the Homoeopathic medicines are good substitute of antibiotics for notorious bacterial pathogens like Staphylococcus aureus and such medicines neither weaken the immunity system nor produce antibiotic resistant microorganisms as compared with the Allopathic medicines.

Key words: Efficacy, Homoeopathic medicine, *Staphylococcus aureus*, Antibiotic susceptibility

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INTRODUCTION

Staphylococcus aureus (S.aureus) is one of the prominent medically important bacterial pathogen. Its potential to cause wide spectrum of pyogenic lesions involving several organs, hospital outbreaks and community acquired infections are well recognized. Many people get infected from *S. aureus*, it is usually found in the lower reproductive tract of females while in males it is mostly found in the nostrils. The effect of *S. aureus* ranges from minor infections to life threatening diseases. It is also one of the common causes of hospital acquired infections. *Staphylococcus aureus* infections are often fatal in nature and have associated resistance to several beta-lactam antibiotics used in hospitals [1-3]. Many studies had reported that homeopathic treatment may recover the patient's physical status and decrease the necessity for conventional antimicrobial agents as well as the rate of infection relapse [4-6]. It has been reported that homeopathic medicines may have antimicrobial effects [4,7]. In the present study we aimed to compare and analyse the effect of six homoeopathic drugs i.e ARNICA, BELLDONNA, BURBERIS, CALENDULLA, SULPHUR and NUX VOMICA.

The present experimental study is about the comparative analysis of Homoeopathic and Allopathic medicines on the susceptibility of *Staphylococcus aureus* isolated from clinical specimen. In this study we observed that homoeopathic medicines can inhibit the growth of bacteria from clinical specimen similar to the Allopathic medicines. According to our study Homoeopathic drugs

are prescribed to the symptomatic patients. In the present study we tried to explore the efficacy of allopathic medicines on pathogenic *Staphylococcus aureus* species in parallel with selected antibiotics.

The objective of the present study was to analysis the efficacy of Homoeopathic and Allopathic medicines on the *Staphylococcus aureus* isolated from clinical specimen.

METHODOLOGY

The present study was conducted at the Institute of Microbiology, University of Sindh, Jamshoro, Pakistan.

Collection of samples

Samples of infected blood serum were collected from Asian Laboratory Saddar, Hyderabad, Pakistan and subjected to culture. Bacterial strains which were highly sensitive to drugs were selected with the help of Culture and Sensitivity. Clinical specimens were taken from serum of infected blood serum (wound). Initially sample of blood was collected in culture tubes then it was taken by sample through pipette and inoculates onto petri dishes or plates of MSA (manitol salt dishes). The MSA is actually media or chemical or agar which has suitable nutrients for the growth of bacteria *Staphylococcus aureus* then those plates was kept for incubation at 37°C temperature for 24 hours.

For testing the antibacterial activity, the disk diffusion method was used. Nutrient agar plates were made by pouring sterilized nutrient agar medium and allowed to solidify for a few minutes in aseptic condition. Filter paper discs of 6 mm diameter loaded with 10 µl of one selected mother tincture and 70% ethanol separately were placed on the surface of the bacterium seeded nutrient agar medium in the respective labelled area. All the plates were incubated in an inverted position for 48 h at 37°C. The work performed in triplicate for each mother tincture against each bacterial strain.

Isolation of *S. aureus* from clinical specimens

Staphylococcus aureus bacterium was cultivated on MSA media (Mannitol Salt Agar) by streak plate method. The culture was incubated at 37°C for 24 hours. Subsequently, on the next day these plates were taken to observe the results, the yellow brownish colonies appeared and were observed. Consequently, the microscopy was done to get confirmation of this bacterium. Biochemical tests were also analysed in order to confirm the identification of the bacteria. Subsequently, the *Staphylococcus aureus* was isolated from sample.

Microscopic and biochemical identification of isolated *S. aureus*

Microscopic examination of golden yellowish colonies appeared on MSA media as performed using 100X power lens to confirm for *S. aureus* bacterial species. After cultural and microscopic examination, biochemical tests were performed for further confirmation of the identified species. For catalase test, a colony of suspected *S. aureus* culture was mixed with 3% H_2O_2 on a glass side. Bubbles on slide indicate a catalase positive test which identifies the *S. aureus* bacteria. Young overnight cultures of *S. aureus* were prepared by inoculating a colony in nutrient broth with the incubation of 24 hours at 37°C.

Selection of medicines

All the selected homoeopathic and allopathic medicines were purchased from Homoeopathic and allopathic Pharmaceuticals, Hyderabad, Sindh, Pakistan.

Lowest and normal potency available were selected to evaluate their efficacy. Two types of homeopathic medicines were used in this study, first one was the homeopathic mother tincture 1X (Concentration) in liquid form and the second one was the homeopathic medicines in 200c potency used through diskettes. All the selected homoeopathic mother tinctures were screened against three pathogenic bacterial strains.

Antibiotic susceptibility test of *S. aureus*

Kirby baur disc diffusion method was used to check the antibiotic susceptibility of bacterium. For this bacterial lawn was made on Muller Hinton agar (MHA) medium and different discs of antibiotics including PENICILLIN, CIPROFLOXACIN, AUGMENTIN and OXACILLIN were placed on the plate with help of antibiotic dispenser. The plates were marked and labelled on the back side with the name of drugs and date and incubated at 37°C for 24 hours. To analyse the effect of homoeopathic drugs a few drops of six homoeopathic drugs named as ARNICA, BELLDONNA, BURBERIS, CALENDULLA, SULPHUR and NUX VOMICA, were plated on media plates with the help of dispenser. The plates were marked and labelled on the back side with the name of drugs and date and incubated at 37°C for 48 hours (Figures 1 and 2).

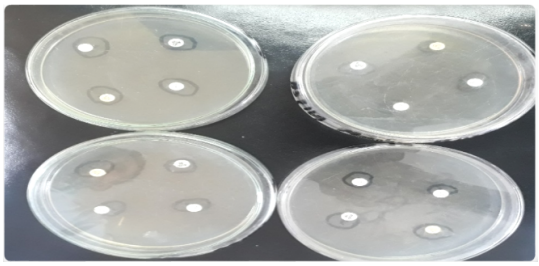

Figure 1: Antibiotic discs used on MHA media plates

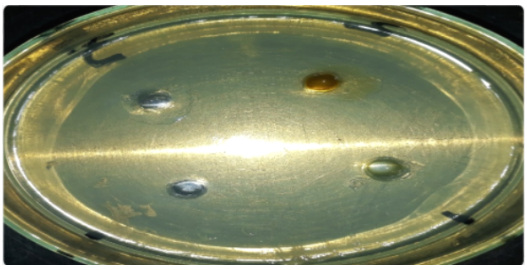

Figure 2: Agar well diffusion method

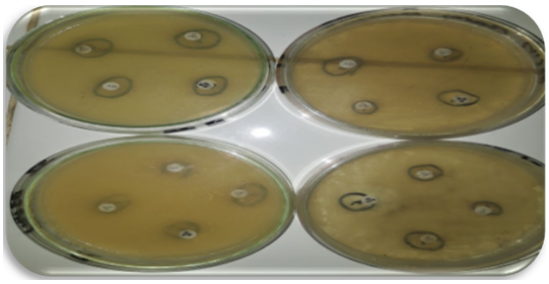

Figure 3: Antibiotic discs on MHA plate against *S. aureus*

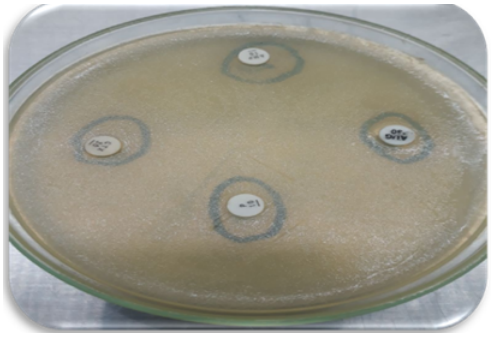

Figure 4: Zone of inhibition by Augmentin on right side

RESULTS AND DISCUSION

The results shows that the mother tincture was not sensitive to inhibit the growth upto 48 hours, however, homeopathic medicines in 200c potency were found very sensitive to inhibit the growth of *Staphylococcus aureus* as comparison to the commercial antibiotics. It was observed that Augmentin was highly effective against *S. aureus* on MHA medium (Figures 3-6, Tables 1 and 2).

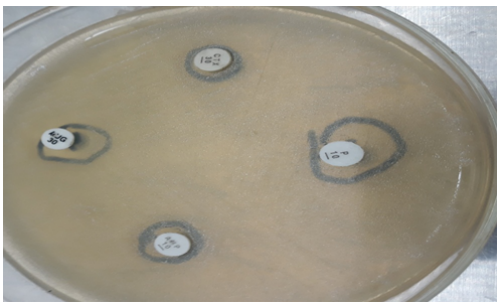

Figure 5: Effect of some selected antibiotics on *S. aureus*

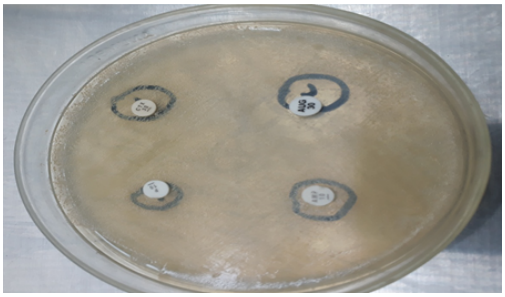

Figure 6: Effect of some selected antibiotics on *S. aureus*

Table 1: Effect of some selected antibiotics on *S. aureus*

S.No.	Antibiotics	Effect on growth	Size of Zone (mm)
1	AUGMENTIN	Sensitivity	5 mm
2	PENICILLUM	Resistant	-
3	CEFROFLAXIN	Resistant	-
4	AMPICILIN	Resistant	-

Table 2: Effect of some selected homeopathic medicines on *S. aureus*

S.No	Medicines	Action	Size
1	BELLADONNA Q (mother tincture)	Resistant	-
	BELLADONNA 200c	Sensitivity	7 mm
2	ARNICA Q (mother tincture)	Resistant	-
	ARNICA 200c	Sensitivity	6 mm
3	CALENDULA Q (mother tincture)	Resistant	-
	CALENDULA 200c	Resistant	-
4	NUX VOMICA Q (mother tincture)	Resistant	-
	NUX VOMICA 200c	Sensitivity	5 mm
5	SULPHUR 3X	Resistant	-
	SULPHUR 200c	Sensitivity	8 mm
6	BERBERIS VULGARIS Q (mother tincture)	Resistant	-

	BERBERIS VULGARIS 200c	Sensitivity	7 mm

Bacterial resistance to antibiotics is a serious health problem worldwide [8,9]. Homeopathy has been studied as possible treatment for infections with drug-resistant microorganisms. In the present study it was observed that the susceptibility pattern of clinical *S. aureus* using some selected antibiotics and homeopathic medicines. A comparative study was performed using Homeopathic and Allopathic medicines on *Staphylococcus aureus*. It was found that *S. aureus* was resistant to most of the antibiotics usage. However, a moderate susceptibility pattern was observed in contradiction of Augmentin (Figures 3 and 4). Homeopathic medicines were found highly effective rather than some commercial well-known antibiotics. A large zone of inhibition was observed when Homeopathic medicines were used as shown in Figures 7 and 8. The zone of inhibition produced by Homeopathic medicines was comparatively larger (5-8 mm) than it was produced by Augmentin (5 mm).

Figure 7: Effect of some selected homeopathic medicines on *S. aureus*

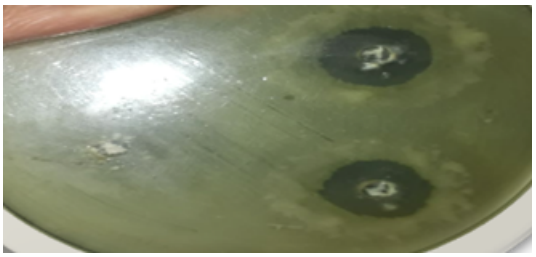

Figure 8: Effect of some selected homeopathic medicines on *S. aureus*

CONCLUSION

Every experimental study was provided both positive as well as negative aspects regarding the purpose shown in the analysis of the study. Homeopathic medicines are prescribed on the basis of symptoms and used for the elongated period of time and considered as a no side effects. In the present study it was observed that resistance of *S. aureus* against most commonly used antibiotics, whereas most of the homeopathic medicines were found most effective and produced a huge zone of inhibition as compared to the test antibiotics. In the conclusion it was observed that Homoeopathic medicines are good substitute of antibiotics for notorious bacterial pathogens like *Staphylococcus aureus* (Figures 9 and 10).

Further studies are needed to test homeopathic medicines against different clinical isolates in a range of concentrations to provide a comprehensive overview about the efficacy of homeopathic medicines and their comparative use against antibiotics. The present work has shown homeopathic medicines are potentially a good source of antibacterial agents which can be used in the future for supporting primary health care.

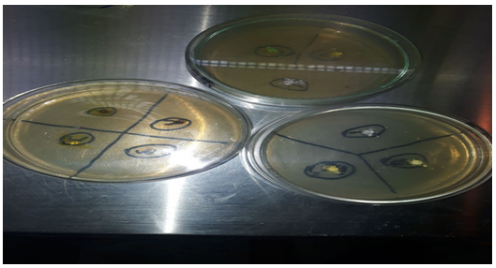

Figure 9: Effect of some selected homeopathic medicines on *S. aureus* by agar well method

Figure 10: Homeopathic medicines used against *S. aureus*

CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this paper.

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