

An In-Vitro Study to Compare the Antibacterial Effect of Different Potencies of The Homeopathic Medicine Kreosotum and Metrogyl Against Staphylococcus Aureus

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ABSTRACT

Antibiotic resistance stands as a paramount challenge in contemporary global health. Certain bacterial strains have developed formidable resistance to a wide array of medications. This pressing issue necessitates the development of new antibacterial agents to effectively combat these resilient pathogens. To this end, the World Health Organization (WHO) has compiled a list of infections posing significant risks to individuals, demanding the urgency of novel treatments. This list is stratified into three priority categories: critical, high, and medium, serving as a roadmap to steer and foster the discovery of innovative antibiotics. Of note, a substantial proportion of the pathogens outlined by the WHO predominantly comprise Gram-negative bacteria. Owing to their intricate cell structure, Gram-negative bacteria exhibit heightened resilience compared to Gram-positive counterparts, thus constituting a major causative agent of various illnesses. This study is fundamentally oriented towards substantiating the antibacterial efficacy of different potencies of the Homoeopathic remedy, Kreosotum in comparison with Metrogyl.

KEYWORDS: Antibacterial activity, Gram-positive bacteria, Homoeopathy, Kreosotum, Zone of inhibition.

INTRODUCTION

Staphylococcus aureus, a prominent member of the Staphylococcus genus, is a Gram-positive bacterium that has garnered significant attention due to its widespread presence and its ability to cause a wide range of infections in humans. ^[1] This pathogen is known for its adaptability and virulence, making it a formidable foe in both healthcare and community settings. ^[2] Its diverse array of virulence factors and resistance mechanisms, including the production of toxins and the acquisition of antibiotic-resistance genes, has earned it a reputation as a challenging and clinically relevant pathogen. With its capacity to cause skin and soft tissue infections, as well as more severe conditions like pneumonia,

bacteremia, and endocarditis, understanding the biology and epidemiology of *Staphylococcus aureus* is critical for effective healthcare management. [3]

AIM & OBJECTIVES

To compare the antibacterial effectiveness of different potencies of Kreosotum against *Staphylococcus aureus*.

To compare the antibacterial effect of the selected Homoeopathic remedy with a positive control Metrogyl.

MATERIALS & METHODS

An experimental study to compare the antibacterial effect of different potencies of the Homoeopathic medicine Kreosotum and Metrogyl against *Staphylococcus aureus*, was conducted at the Research Facilitation Centre of Sarada Krishna Homoeopathic Medical College. The bacterial strains were cultured in Mueller Hinton medium and the sample of medicine was mixed separately with 1 drop of sample with 1ml of distilled water and then it was impregnated in a round filter paper disc. Plain discs medicated with 30, 200C and 1M potencies of Kreosotum along with Metrogyl standard were placed in Muller Hinton Broth for incubation at 37°C for 24 hrs and then assessed by the zone of inhibition around the disc. The size of the zone of inhibition (including the disc) was measured in millimetres. The absence of zone inhibition was interpreted as the absence of activity. The activities were expressed as resistant if the zone of inhibition is less than 7 mm, intermediate (8-10 mm) and sensitive if more than 11 mm. [4]

Conducting the study / obtaining data by a disc diffusion method or Kirby-Bauer testing method on culture medium. The drugs for conducting the study are Kreosotum 30, 200C and 1M and positive control Metrogyl. These are divided into 4 groups

Group I – Kreosotum 30

Group II – Kreosotum 200C

Group III – Kreosotum 1M

Group IV – Metrogyl

OBSERVATION & RESULTS

Kreosotum potencies 30, 200C and 1M showed an antibacterial activity for *Staphylococcus aureus* and the effectiveness of homoeopathic medicine is seen by observing the zone of inhibition around the disc which ranges from 1mm & to 7mm for different potencies.

TABLE 1: Anti-bacterial activity of homoeopathic medicine and control by Kirby-Bauer method

BACTERIAL STRAIN	MEDICINE	INHIBITION ZONE
STAPHYLOCOCCUS AUREUS	KREOSOTUM 30	4 MM
	KREOSOTUM 200 C	7 MM
	KREOSOTUM 1M	5 MM
	METROGYL	1 MM



FIGURE 1: CULTURE MEDIUM BEFORE INCUBATION



FIGURE 2: ZONE OF INHIBITION AFTER 24 HRS OF INCUBATION

DISCUSSION

The primary cause behind the challenges in treating multi-resistant Gram-Positive bacteria lies in the widespread and excessive use of antibiotics within both community and hospital settings. Consequently, it is imperative to devise and implement strategies aimed at reducing the unnecessary prescription and consumption of antibiotics. The in-vitro analysis yielded highly promising results. It demonstrated that the Homoeopathic remedy Kresotum 200C possesses specific inhibitory and bactericidal properties against Gram-positive bacteria, chosen based on the Homoeopathic repertory. Unlike many contemporary medicines, which may encounter resistance in Gram-positive bacteria and potentially lead to undesirable side effects, Homoeopathic remedies are known for their absence of adverse reactions. Moreover, they exhibit inhibitory activity against the bacteria. This makes homoeopathic treatment a cost-effective, preventative, and secure mode of therapy, rendering it the optimal choice for this purpose. The experiment's outcomes serve as concrete evidence that ultra-diluted homoeopathic medicines are indeed effective in in-vitro antibacterial studies, firmly establishing them as evidence-based medicine rather than mere placebo therapy.

CONCLUSION

The results of this antibacterial study provide robust support for the principles of Evidence-Based Medicine, conclusively demonstrating that Homoeopathic medicine exhibits specific inhibitory effects against Gram-positive bacteria. Notably, Kreosotum 200C, a particular Homoeopathic medicine, displayed the most potent antimicrobial activity, generating a substantial 7mm inhibition zone. This remarkable efficacy against Gram-Positive bacteria positions it as a viable treatment option for various ailments, including but not limited to Bacteraemia, Infective Endocarditis, Suppurative Affections (CSOM), Surgical Infections, Septic Shock, Septic Arthritis, and Nosocomial Infections. It can serve as a complementary and alternative approach to conventional antibiotics. Furthermore, it's worth noting that different potencies of the same Homoeopathic medicine yielded varying effects on microbial growth,

suggesting the need for a more in-depth kinetic study to explore these nuances further. Future investigations should also focus on evaluating the in-vivo activity against Gram-positive bacteria to provide a comprehensive understanding of the therapeutic potential of Homoeopathic treatments in clinical settings.

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