Assessment the Frequency of *Staphylococcus aureus* Golden Methicillin-Resistant (MRSA) and Vancomycin-Resistant VRSA in Determining the MIC Using E-Test

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Abstract

*Staphylococcus aureus* infections, occur widely in the community and hospitals. The aim of this study was to evaluate the prevalence of resistance to methicillin and vancomycin in patients with *Staphylococcus aureus* compared to the Antibiogram.

Keywords: *S. aureus*; Resistance to methicillin and vancomycin; E-Test; Antibiogram

Introduction

*S. aureus* is a gram-positive coccobacterium that is a member of the Firmicutes, and is frequently found in the nose, respiratory tract, and on the skin. It is often positive for catalase and nitrate reduction and is a facultative aerobe that can grow without the need for oxygen [1]. Although *S. aureus* is not always pathogenic, it is a common cause of skin infections such as abscesses, respiratory infections such as sinusitis, and food poisoning. Pathogenic strains often promote infections by producing potent protein toxins, and expressing cell-surface proteins that bind and inactivate antibodies. The emergence of antibiotic-resistant strains of *S. aureus* such as methicillin-resistant *S. aureus* (MRSA) is a worldwide problem in clinical medicine.

*Staphylococcus* was first identified in 1880 in Aberdeen, Scotland, by the surgeon Sir Alexander Ogston in pus from a surgical abscess in a knee joint [2]. This name was later amended to Staphylococcus aureus by Friedrich Julius Rosenbach, who was credited by the official system of nomenclature at the time. An estimated 20% of the human population are long-term carriers of *S. aureus* [3] which can be found as part of the normal skin flora and in the nostrils [3,4]. *S. aureus* is a normal inhabitant of the healthy lower reproductive tract of women [5,6]. *S. aureus* can cause a range of illnesses, from minor skin infections, such as pimples [7], impetigo, boils, cellulitis, folliculitis, carbuncles, scalded skin syndrome, and abscesses, to life-threatening diseases such as pneumonia, meningitis, osteomyelitis, endocarditis, toxic shock syndrome, bacteremia, and sepsis. It is still one of the five most common causes of hospital-acquired infections and is often the cause of postsurgical wound infections. Each year, around 500,000 patients in hospitals of the United States contract a staphylococcal infection, chiefly by *S. aureus* [8-10].

Materials and Methods

This cross-sectional study was conducted during one year from 2017. The study population included both newly admitted hospital patients and patients with hospital infections. Nosocomial infection means infection 48 hours after admission was considered. In this study, all samples, including samples of patients with wound secretions and body fluids in the lab, CSF, blood, urine microbiology Sina Hospital were sent, beginning in the chocolate (MSA) and then for the differential diagnosis of mannitol salt agar if you were cultured positive for *Staphylococcus aureus* were enrolled. All 85 subjects who entered the study with oxacillin and vancomycin E-test methods for disk diffusion method were investigated. Oreo *S. aureus* to determine if growth and fermentation DNAse, gram-positive cocci coagulate tests, CAT was used. In MSA of mannitol on mannitol salt agar positive multiple instances of a patient, only one positive sample was studied.

After determining the strains of *S. aureus*, antibiotic sensitivity test on Mueller-Hinton agar by standard methods Disc diffusion (prepared bacterial suspension in saline 9% and compared with the standard concentration half McFarland) to determine the susceptibility or resistance to oxacillin 1 μg identifying resistant 30 μg vancomycin and methicillin and cefoxitin 30 μg was done. 24 hours after the plates were incubated at 37°C, in accordance with the inhibitory zone diameter (CLSI) Clinical Laboratory Standard Institute was read. To determine the resistance to oxacillin addition cefoxitin oxacillin disk was used. High-media consumer disks owned by E-test strips for participation AB BIODISK India and Sweden. Also, the standard strains of *S. aureus*...
ATCC 25923 were used for quality control of work in each series. Since Disc diffusion method is only qualitative and quantitative data regarding the sensitivity or resistance to clinical application not be obtained, oxacillin and vancomycin using E-test was used to determine the MIC (Figures 1 and 2).

**Results**

During a year of study were 85 positive cultures of *Staphylococcus* that 46 of the patients were male (54%). Subjects ranged in age from 13 to 86 years and a mean age of 51.46 ± 19.213 years. The most common surgical wound infections and septicemia were the primary.

**Discussion**

*S. aureus* is one of the most important factors for infection in human society and one of the major problems of public health, drug resistance. In our study, no significant relationship between age and gender of patient's is didn't. studies have reported similar results. Results showed that 40 patients (59.7%) of 67 patients who had nosocomial infections due to *S. aureus* and 3 patients (16.6%) of 18 patients who had acquired infection, MRSA were suffering.

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