INTRODUCTION

Nosocomial infections remain a major global concern, the most important and frequent mode of transmission of nosocomial infections is divided into two sub groups, direct contact and indirect contact (Pena et al.,). They constitute a major public health problem worldwide; increasing antibiotic resistance of pathogens associated with nosocomial infections has also become a major therapeutic challenge for physicians (Vogt and Dippold).

Hospital acquired infections occur in about 5% of all patients admitted to hospital. Nosocomial infections result from interaction of several factors such as microorganisms in the hospital environment, the compromised immune status of the host and the chain of transmission in the hospital. Staphylococcus has been reported as the most important and wide spread hospital pathogen. This has been implicated as the most common cause of surgical wound infections and pneumonia and the second most common cause is blood infection, other pathogens common in the hospital environment include E. coli, Enterococcus, Pseudomonas, Candida, Klebsiella (Shilpa jalalpour and Abdul Ghaffar ebadi).

Bacterial infection is a common cause of hospital acquired infections; most of the bacterial infections can be easily diagnosed and treated with few exceptions. The emergence and spread of resistant bacteria is complicating the treatment of serious hospital acquired infections and threatening to create species resistance to all available agents (Bartosova et al.,).

Antibiotic resistance among bacteria is becoming a serious problem throughout the world. It is said that the evolution of bacteria towards resistance is unavoidable because it represents a particular aspect of the general evolution of bacteria that is unstoppable. Thus, in the present study, an attempt has been made to know the current status of antibiotic sensitive/ resistant pattern of common bacterial isolates in the general ward of government hospital, Hyderabad.

MATERIALS AND METHODS

Isolation and characterization of Nosocomial microorganisms

Medically important selective media was prepared and sterilized in an autoclave. The petriplates were exposed to hospital environment in the general ward by petriplate exposure method at different time intervals starting from 5,10,15,20,25 and 30 minutes respectively. Then all the plates were incubated at 37° C for 24 to 48 hours and counted to know the total viable cells. Bacterial colonies were purified by taking single colony each time in a streak plate method on medically important selective media repeatedly; at least 7 times
until plate contain single type of colonies. These purified colonies were further subjected to morphological and biochemical characterization (Ariffin et al., Durmaz et al., Baron et al., Barrow and Felthan and Bartosova et al.).

Antibiotic susceptibility test

Antibiotic susceptibility test was performed by Kirby Bauer’s disc diffusion method on Muller Hinton agar medium (high media, Mumbai). In accordance with standards of clinical laboratory standards institute (CLSI) formally national committee clinical laboratory standards (NCCLS) guidelines. The concentration of various antibiotics for tested organism viz. penicillin (15 & 30 µg), ampicillin (15 & 30µg), chloramphenicol (15 & 30 µg), tetracycline (15 & 30µg), streptomycin (15 & 30µg) respectively. The antibiotic diffuses from a paper disc or a small cylinder into an agar medium that contains test organism. A common application of the method of Kirby Bauer disc test is that the paper disc contains known concentration of antibiotics. Antibiotics are applied to the surface of the Muller-Hinton agar plates and were incubated at 37°C for 24-48 hours, after overnight incubation, the susceptible of resistance isolates were identified in the presence of zone of inhibition around the antibiotic discs. The inhibition zones were measured in mm.

Statistical analysis

By using Kirby-Bauer Disc Diffusion Method the antibiotic susceptibility test was performed for the four different isolates. The quantitative data was checked for completeness and coded (Kirkl and Briggs and http://www.who.int/csrresources/publications/whocdscreph 2002.pdf.accessed). The antibiotic susceptibility testing was performed for the selected bacterial isolates are summarized in table 1 and 2. The isolates were identified based on morphological and biochemical characteristics and the results of the selected bacterial isolates are categorized into susceptible, resistant and intermediate. For sample collection the medically important selective media were prepared and the plates were exposed to the general ward in the ESI Hospital, Hyderabad, Andhra Pradesh. The plates were incubated at 37°C for 24-48hrs. The bacterial isolates were purified by streak plate method to obtain pure colonies. The isolates were identified based on morphological and biochemical characteristics and the results of the selected bacterial isolates are summarized in table 1 and 2. The isolates were identified as Staphylococcus, E. coli, klebsiella and Enterobacter.

By Kirby-Bauer Disc Diffusion Method the antibiotic susceptibility testing was performed for the four isolates. Antibiotic susceptible results depict that ampicillin and penicillin are resistant to our isolates whereas tetracycline, streptomycin, chloramphenicol is sensitive to our bacterial isolates. The quantitative data was checked for completeness and coded (Kirkl and KB et al., Pena et al., Shilpa jalapour and Abdul Ghaffar ebadi. V.O Oyetayo and R. Miori., Vogne C et al., Vogt, R.L., and Dippold, L http://www.who.int/csrresources/publications/whocdscreph 2002.pdf.accessed). The different types of antibiotic susceptible triplicates values are subjected to statistical analysis by using SPSS (statistical software package) followed by mean, standard deviation and probability test (P < 0.05).

Table 1: Morphological characterization of Nosocomial isolates

<table>
<thead>
<tr>
<th>S.No</th>
<th>Characterization</th>
<th>Isolate 1</th>
<th>Isolate 2</th>
<th>Isolate 3</th>
<th>Isolate 4</th>
<th>Colony morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Colony morphology</td>
<td>Yellow, slimy circular</td>
<td>Round, small enteric</td>
<td>Round, smooth, enteric</td>
<td>Shiny colony</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Shape of the colony</td>
<td>Cocci</td>
<td>Rod</td>
<td>Rod</td>
<td>Rod</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Gram’s stain</td>
<td>Positive</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>4.</td>
<td>KOH Test</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Motility Test</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Biochemical characterization of Nosocomial isolates

<table>
<thead>
<tr>
<th>S.No</th>
<th>Biochemical Test</th>
<th>Isolate 1</th>
<th>Isolate 2</th>
<th>Isolate 3</th>
<th>Isolate 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Indole</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>2.</td>
<td>Methyl Red</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>3.</td>
<td>Voges Proskauer</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>4.</td>
<td>Simmon’s citrate</td>
<td>Negative</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>5.a</td>
<td>Carbohydrate fermentation</td>
<td>Glucose - Acid &amp; Gas</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>5.b</td>
<td></td>
<td>Sucrose - Acid &amp; Gas</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>5.c</td>
<td></td>
<td>Lactose - Acid &amp; Gas</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
</tbody>
</table>
The microbiological quality of air in hospitals is as much of an issue as in other type of buildings, with increased emphasis because of the potential severity of the consequences of nosocomial infections. Many patients are actually at increased risk of infection while in the hospital. The problems of nosocomial infection are generally largest in older hospitals which may have large wards and poor or no mechanical ventilation and the situation is even more difficult in developing countries (Archibald et al.,).

The results from this study showed that the government hospital had a higher degree of contamination with airborne micro flora and in indoor air rather than the private hospital. These high rates in the government hospital might be attributed to the age, poor hygienic condition, and low degree of cleanliness and minimal application of disinfection procedures against airborne bio-contaminants. The high number of visitors that commonly enter the patients room and the amount of materials brought from outside by the visitors, such as food, fruits and flowers were more common in the patients rooms; these are the recognized source of hospital contamination. Intensive care units are high risk areas for infections caused by antibiotic resistant bacteria that may spread to other clinical areas of the hospital (Courvalin P et al., Danishta et al., Jarvis WR and Martone WJ., Kanouff et al., Kirkl et al.,).

The number of microorganisms in the operation theaters and neonatal ward was extremely low. This was anticipated due to the high sanitary standards in that areas compared to the other hospital areas.

**DISCUSSION**

Nosocomial infections occur worldwide and affect both developed and developing countries (World health organization. Ed., A Practical Guide) Many of these infections are associated with microorganisms that are resistant to antibiotics and can easily spread by hospital personnel (B. Durmaz) Guidelines for antibiotic therapy can be helpful for clinicians to select more appropriate antibiotics for effective treatment and prevent the development of drug resistance. Hospital associated infections have been linked with many factors among which the critical microbial quality of the air of general ward of government hospital. This infection occurs in 5% of all acute care hospitalization in India and has been reported to be responsible for the death of one out of every five thousand patients attending a hospital (Ariffin et al., B. Durmaz et al., Barrow et al., Bartosova et al.,).

CONCLUSION

It is concluded that in Govt. Hospital there is an involvement of both gram positive and gram negative bacteria for cause of nosocomial infections. Nosocomial microbes are resistant to commonly used antibiotics like penicillin and ampicillin, but sensitive to streptomycin, tetracycline and chloramphenicol etc. The lack of knowledge regarding hospital microbiota and the improper monitoring of antimicrobial therapeutic can lead to microbial resistance and favoring selective pressure to developing resistant strains.

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**REFERENCES**


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