Isolation and antimicrobial susceptibility of bacteria from external ear canal of cancer patients at Shafa Cancer Hospital - Ahwaz

ABSTRACT

A bacteriological study of external ear canal was performed in 52 hospitalized cancer patients and 42 non-hospitalized cancer patients at Shafa hospital, Ahwaz. Study was undertaken to find out the normal flora changes in the external ear canals and to observe the prevalence of external otitis among these cancer patients. The control group consisted of 40 non-cancer patients.

We observed the following bacteria among hospitalized cancer patients. Staphylococcus Coagulase negative (51.9%), Staphylococcus aureus (15.7%) and Streptococcus pneumoniae (11.9%). Similarly, among non-hospitalized cancer patients, Staphylococcus Coagulase negative (45.2%), S. aureus (9.5%) and Streptococcus pneumoniae (4.7%). Incidence of Staphylococcus Coagulase negative and Streptococci pneumoniae is higher in control group than that in cancer patients [Table 1].

We have concluded that cancer patients probably suffer from external otitis more frequently because of enhanced colonization by S. aureus (P >0.05).

The antimicrobial susceptibility of these organisms to various antibiotics was determined by disk diffusion method using Muller Hinton agar. In hospitalized cancer patients Staphylococcus Coagulase negative was 25% and 85% resistant to Vancomycin and Penicillin G and in non-hospitalized cancer patients, Staphylococcus Coagulase negative were 45% and 80% resistant to Vancomycin and Penicillin G. S. aureus of both the groups (hospitalized and non-hospitalized) were sensitive Penicillin G. Similarly, both the groups were 55% and 50% resistance to Vancomycin.

Key words: Ear canal, microbiology, oncology, antimicrobial susceptibility

INTRODUCTION

Otitis Externa is an infection of the external auditory canal (EAC) that can be divided according to the time course of the infection: acute, subacute, or chronic. Acute otitis externa (AOE) is a bacterial infection of the EAC, commonly referred to as “swimmer’s ear” that can further be divided into pre-inflammatory and acute inflammatory stages. It is well known that organisms potentially pathogenic to the middle ear can be found in the EAC and causes the same.[3]

Clinical observations suggest that EAC, which is frequenting exposed to microbial pathogens actually is less disposed to infection than the middle ear cavity[2] but some investigators illustrated the poly-microbial nature of external ear canals may causes Otitis by organisms like S. aureus, Peptostreptococcus spp, Pseudomonas aeruogonensis and Bacteroides spp.[3-4]

Other workers also reported that the most commonly isolated pathogens are Pseudomonas aeruginosa and Staphylococcus aureus. Other pathogens less commonly cultured include Proteus mirabilis, Streptococi species, coagulase negative Staphylococci, and various gram negative bacilli.[5-6]

Based on literature survey we aimed to observe the changes of the bacterial flora of external ear canal, to study the antimicrobial susceptibility testing and to find out why external Otitis occurs in cancer patients.

MATERIALS AND METHODS

Patients
A total of 52 hospitalized and 42 non-hospitalized cancer patients with age distribution of 2-60 years...
old were selected for this study.

**Bacterial strains**

All bacterial strains used in this study were isolated from external ear canal by swabs. The strains were identified by standard microbiological methods.[7]

**Susceptibility testing**

The bacterial strains were tested for resistance to antimicrobial agents by performing disc diffusion method using commercial discs (bioMerieux) according to the guidelines of the national committee for clinical laboratory standard.[8]

**Statistical analysis**

Data were analyzed using SPSS (Version 9) by Chi-square test.

**RESULTS**

Swabs from EEC were obtained from 52 hospitalized and 42 non-hospitalized cancer patients from September 2004 through March 2005.

*Staphylococci spp* (coagulase negative), *S. aureus* and *Streptococcus pneumoniae* were the prominent isolates from external ear canal [Table 1].

The results from antimicrobial susceptibility tests showed *S. aureus* were resistant to CF from hospitalized patients. However, for the isolated *Streptococcus pneumoniae* the prevalence of resistance was highest towards penicillin G (75%) and least against Vancomycin (35%). Similarly, *S. aureus* isolated from non-hospitalized patients was resistant to CF. On the other hand, for the *S. pneumoniae* the prevalence of resistance was highest towards Penicillin G (75%) and least against vancomycin (25%) [Table 2].

**DISCUSSION**

Cancer patients are known to be immunocompromised and susceptible to various infections. Bacterial infections have emerged in the last decade as particularly devastating complications of cancer treatment because to increased resistance to drugs, including the emergence of bacterial strains that are resistant to all available antibacterial agents, has created a public health problem of potentially crisis proportions.[9]

The objective of this study was to observe the changes of the bacterial flora on external ear canal, the antimicrobial susceptibility testing and to find out why external Otitis occurs in cancer patients as otitis continues to be an important public health problem around the world.[1] EAC has its own bacterial flora and stays free of infection as long as its defense mechanisms are not disrupted.

We isolated *S. coagulase negative, S. aureus* and *S. pneumoniae* in the external ear canal of cancer patients. Our observation suggests that, although, external ear canal is less disposed to infections than the middle ear cavity, but colonization of these bacteria may cause otitis. Several investigators reported that the most common bacterial pathogens are *Pseudomonas spp, S. pneumoniae* which may causes otitis.[9-11] Similarly, Brosk et al.[9] reported isolation of 73 bacteria from ear canals. Commonly recovered bacteria were *Pseudomonas spp, S. aureus, Proteus spp, Klebsiella pneumoniae*. Their findings demonstrated the poly-microbial bacteriology of ear canals related to Otitis in children. Our finding correlates with that of Juan K et al.[9]

**CONCLUSION**

We have concluded that cancer patients probably suffer external otitis more frequently because of enhanced colonization by *S. aureus* (*P* >0.05). Further prospective studies are warranted for evaluating the role of *S. aureus* in this infection and the therapeutic implications of these findings.

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**REFERENCES**


