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MICROBIOLOGICAL PROFILE OF EAR INFECTION IN A TERTIARY CARE HOSPITAL OF ASSAM.

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ABSTRACT

Background: The objective of this study was to know the microbiological pattern of ear infection in patients attending tertiary care hospital. **Methods:** The present study was conducted at a tertiary care hospital from Assam, India during 1st July 2014 to 30th July 2016. Before conducting the study approval was obtained from Institutional Ethical Committee for human research. Total 226 patients of ear infection cases were included after written informed consent. The ear discharge from each diseased middle ear was collected and inoculated on blood agar, MacConkey's agar, chocolate agar and Sabourad Dextrose Agar (SDA) media and were incubated at 37°C for 24 hours SDA for 25°C for 72 hours. The organisms were identified by using a standard procedure. **Results:** Out of 226 samples 214(94.6%) sample culture positive. 243 organisms isolated from 226 samples where single organism was isolated in 214 cases and double organism isolated in 29 cases. Out of total 243 strains isolated 218 were bacterial species and 25 fungal species. Out of 218 bacteria 138 (63.3%) were gram positive and 80 (36.7%) were gram negative organisms. Among gram positive organisms, Staphylococcus aureus 117(84.7%) was predominant organisms isolated and among gram negative organism Pseudomonas aeruginosa 58 (72.5%) was predominant organisms isolated followed by Klebsiella species 11(13.75%). Among fungal species Candida species 17 and Aspergillus niger 8 was commonly isolated. **Conclusions:** Staphylococcus aureus and Pseudomonas sp. were found to be the common cause of ear infection in our study.

KEYWORDS: Bacteriology, Ear infection, Culture & sensitivity.

INTRODUCTION

The ear is the organ divided into the outer, middle and inner ear, responsible for hearing and also maintaining balance. The outer and middle regions are most susceptible to injury and infections. An ear infection usually refers to an infection caused by bacteria, virus and fungus of the middle portion of the ear that lies behind the eardrum. The commonly occurring symptoms are ear discharge, deafness, itching, pain and sometimes fever.[1] Ear infections are painful because of inflammation and fluid accumulation in the middle ear. Ear infections are divided into chronic or acute. Acute ear infections are painful but short in duration. Chronic ear infections may recur many times. Chronic ear infections can cause permanent damage to the middle and inner ear. Ear infections are common in babies and young children. Most children will have an ear infection before the age of five years.[1,2] Chronic Suppurative Otitis Media (CSOM) is chronic inflammation of middle ear. CSOM presents with ear discharge and conductive deafness, if left untreated causing more severe loss of hearing. CSOM is a global problem in developing and developed countries, and affects all ages but especially prevalent in children younger than 7 years, if it is left untreated complications may occur.[2] There is no such report from Northeastern region on the microbiological pattern of ear infection. So, we have studied the bacteriological profile of ear infection in patients attending a tertiary care hospital from this part of India.

MATERIALS AND METHOD

The study was conducted at Department of Microbiology, down town hospital ltd and Assam down town University, Guwahati. We have collected retrieval data from the period of July 2014 to July 2016 and collected information of 226 patients sample where 120 patients were male and 106 patients were female.

Microbiological Processing of sample

Ear swabs were immediately processed. Samples were collected in two sterile cotton swab with the help of aural speculum from each patient and processed in the Microbiology laboratory. Gram stain was performed from the first swab for microscopic evaluation of gram reaction and to see the morphology under oil immersion. Second swab was inoculated to culture media like Blood agar, Nutrient agar, Mac-conkey agar, Chocolate agar and Sabourad Dextrose Agar (SDA). The plates were incubated at 37°C for 24 to 48 hrs and only SDA at 25°C for 72h to one week. The organisms were identified on

culture media by colony morphology, hemolysis pattern etc. as per standard procedure. Pathogenic and non pathogenic staphylococcus were identified by slide coagulase test method and tube test. The gram negative bacilli were tested by motility by hanging drop, oxidase /catalase test, production of pigments, sugar fermentation reaction and biochemical tests like indole, methyl red, VP, citrate, urease were done.[3]

RESULTS

Out of total 226 samples 214 (94.6%) positive culture mono-microbial growth was seen whereas 29(12.8%) samples showed poly-microbial growth. 120 (53%) patients were male and 106(47%) patients were female. Out of 226 cases 28 (12.3%) patients were in the age group of 0-14 years, 60 (26.5%) patients were in age group 15-29years, 68 (30%) patients were in the age group 30-44 years, 41 (18.1%) patients were in age group 45-59 years and 29 (12.8%) patients were in the age group 60 years and above. The peak incidence was observed in age group between 15 year and 45 years (56.6%). 138 (56.7%) gram positive organism, 80 (33%) gram negative organism and 25 (10.3%) fungus were identified from 243 organism isolated. Staphylococcus aureus 117 (48%) was the organism isolated predominantly followed by Pseudomonas aeruginosa 58 (24%) with other organisms.

Out of 138 strains of gram positive organism's Staphylococcus aureus 117 (85%), S. haemolyticus 13 (9%), S. epidermidis 4(3%) and Enterococcus spp 4(3%) (table1). Staphylococcus aureus 117(84.7%) was predominant organisms isolated among gram positive organisms.

Out of 80 strain of gram negative organisms 58 (72.5%) Pseudomonas aeruginosa, 11 (13.75%) Klebsiella spp, 5 (6.25%) Proteus mirabilis, 3 (3.75%) E.coli and 3 (3.75%) Acetobacter spp. Among gram negative organism Pseudomonas aeruginosa 58 (72.5%) was predominant organisms isolated followed by Klebsiella species 11(13.75%) (Table 1).

Out of 25 fugal isolates, Candida species 17 (68%) was isolated more and Candida albicans most commonly isolated among them and followed by Aspergillus niger 8 (32%) (table1).

Table 1: Distribution of organism isolated from clinical specimens from the patients

Total no. of Patients	Total no. of Isolates	No. of single growth	No. of double growth	Types of organism	Number of varities of organisim with species		
					Name of the organism	**Numbers**	**Percentage**
226	243	214	29	Gram Positive bacteria =138 (56.7%)	Staphylococcus aureus	117	85%
					S. haemolyticus	13	9%
					S. epidermidis	4	3%
					Enterococcus spp	4	3%
					Total (A)	**138**	**100%**
				Gram Negative Bacteria =80 (33%)	Pseudomonas aeruginosa	58	72.5%
					Klebsiella spp	11	13.75%
					Proteus mirabilis	5	6.25%
					E.coli	3	3.75%
					Acetobacter spp.	3	3.75%
					Total (B)	**80**	**100%**
				Fungus =25 (10.3%)	Candida	17	68%
					Aspergillus niger	8	32%
					Total (C)	**25**	**100%**
226	**243**	**214(88%)**	**29(12%)**	**243=(100%=56.7 +33%+10.3%)**	**A+B+C**	**243**	**100%**

DISCUSSION

Majority of the patients were from the age group 15-45 which comprises 56.6% of the population, In this study. This is similar with some of the previous studies. However, most of the studies from India has showed the infection is most common in the age group of 0-14 years of age.[5,6,7]

In our study, 120 (53%) patients were male and 106 (47%) patients were female. Thus males were affected more in our study which is in accordance with other study from Northeastern region[8], other part of India[3,9,10,11] and outside of India[12,13,14]

In our study monomicrobial growth was seen in maximum number of cases 214 (94.6%) and poly-microbial growth showed in 29 samples (12.8%), whereas other studies also showed similar result.[8,9,11,13] The peak incidence of age was observed in age group between 15 year and 45 years (56.6%) which is not similar to other studies, where other studies from India and different part of world showed early (1 to 20 years) age ear infection.[4,5,6,7,11]

In our study among gram positive organisms, Staphylococcus aureus (85%) was predominant organisms isolated followed by Staphylococcus haemolyticus (9%) and among gram negative organism Pseudomonas (72.5%) was predominant organisms isolated followed by Klebsiella species (13.75%). Overall Staphylococcus aureus 117 (48%) was the organism isolated predominantly followed by Pseudomonas aeruginosa 58 (24%) in our study.

However, most of the study from India showed the isolation of Pseudomonas predominantly followed by Staphylococcus aureus (T Deb et al from Agartala, D Arif et al from Mumbai, K N Patel from Gujrat, PNS Moorthy from Hyderabad, R S Gaur from Tamilnadu).

We have isolated 48% S. Aureus in our study. Taneja Mansi et al had isolated S. Aureus as the most common organism in their study, but the percentage of isolation (33.3%) was lesser when compared to our study.[15] A study from Kumaon, Uttarakhan studied 75 patients with otitis media and found S. aureus was the most common isolate followed by Pseudomonas sp.[16] In our study, Staphylococcus aureus and Pseudomonas sp. together account for 175(81.7%) positive cases. However, other studies reported S.aureus and Pseudomonas Spp is the most common isolate from ear infection but lesser than our study.[1-5,8,9,11]

CONCLUSION

Staphylococcus aureus and Pseudomonas sp. were found to be the common bacterial causes of ear infection in our study. Our data may contribute to an successful management of ear infection cases in Northeastern India.

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