

A Comparative Clinical Study of Bacterial Flora in Patients with Otitis Externa

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ABSTRACT

Aim: To compare the bacterial flora in acute otitis externa patients and healthy subjects.

Methods: In current study a total 200 individuals were selected and were divided into two groups. 80 healthy individuals were in control Group A, while 120 patients with acute otitis externa were in Group B. After complete ear examination, the ear samples of all the individuals were collected. Each sample was examined under microscope and cultured according to the standard protocol. The results were significant <0.005. The proportion of pathogenic bacteria was significantly different and high in cases of acute otitis externa patients as compared to normal healthy individuals. The G +ve (77.3%), (35.5%) and G -ve (20.1%) (60%) pathogenic bacteria were isolated in both groups respectively.

Conclusion: Despite the changes in life style, new strains of bacteria and drugs resistance. Overall pattern of bacterial involvement in cases of acute otitis externa and normal bacterial flora remains the same.

Keywords: Bacterial flora, Acute otitis externa, Staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas, Diphtheroid

INTRODUCTION

Inflammation of ear canal is called otitis externa; it may be acute or chronic. Acute otitis externa mostly result from bacterial infection while chronic otitis externa is mostly caused by allergies and autoimmune disorders (Bovo et al 2012). Patient feel pain and swelling in the ear canal due to acute otitis externa. The classical sign is tragal tenderness or painful pinna with movement (Campos et al 2000). Pus or dirty discharge from the ear is very common finding in acute otitis externa. Complications are very rare though but in uncontrolled diabetics it can lead to malignant otitis externa, which is where an infection spreads from the ear canal into the surrounding bone (Jeyanthi et al 2009). This condition is associated with excruciating pain, granulation tissue formation and spread of the disease process to skull base with involvement of cranial nerves. Fungus especially aspergillosis is another common cause of otitis externa characterized by intense itching, pain, dirty ear discharge and wet blotting paper debris.

In a research 226 Microbiological samples were collected from the ears of patients with acute otitis externa for a period of 1 year. A wide variety of bacteria and fungi was isolated. Many researchers concluded through their research that common isolated bacteria from the ear wax of the patients of acute otitis externa are Gram-positive and Gram-negative bacteria. Most of them were Pseudomonas

aeruginosa, Streptococcus pyogenes, and Staphylococcus aureus (Kiakojori et al 2010).

The chances of developing otitis externa can be minimized by avoiding ear buds, cotton wool and any other sharp object used to address itching in the ears even with the finger nails. Regular swimmers must use swimming cap to cover the ears and protect them from water. Try to avoid shampoo, soap or any detergent getting into the ear especially when there is positive past history of such disease. In many cases acute otitis externa become well with precaution without any treatment but may take much longer as compared to the patients taking oral and topical antibiotics (Nambiar et al 2015).

MATERIALS AND METHODS

Current comparative controlled clinical study was conducted in ENT departments of CMH Rawalpindi and CMH Gujranwala Pakistan. In the present study a total of 200 individuals were selected and were divided into two groups. 80 healthy individuals were in control Group A, while 120 patients with acute otitis externa were in Group B. Age of the individuals were between 20 years to 40 years. All of them were otherwise healthy, non diabetics and free of skin diseases. Patients with underlying chronic supportive otitis media and otomycosis were excluded from the study. After complete ear examination, with the help of swab samples of all the individuals were collected from their ear canal. All samples were sent to microbiology department for direct microscopic examination and culture sensitivity according to the

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standard protocol. Raw data was expressed by model (SPSS) and p-value equal to or less than 0.05 was considered as significant.

RESULTS

The most common bacteria identified in the patients with acute otitis externa of Group B were *Staphylococcus aureus*, *Bacillus* and *Pseudomonas*. On the other hand *Staphylococcus epidermidis*, *Diphtheroid* and *Streptococcus* were found in Group A while little nonbacterial strains were also isolated. In Group A, 30 female and 50 male normal individuals were selected. The G +ve (77.3%), (35.5%) and G -ve (20.1%) (60.0%) bacteria were isolated in both groups respectively. The P-value of Group A and Group B has significant (<0.005) difference in both groups.

Group A: (n=80) Healthy individuals

Bacterial flora	Mean %	P-value
G +ve	77.3%	0.000
G -ve	20.1%	0.054
Non bacterial stain	2.6%	0.768

<0.005

Group B: (n=120) Patients with acute otitis externa

Pathogenic bacteria	Mean %	P-value
G +ve	35.5%	0.000
G -ve	60.0%	0.000
Non bacterial stain	4.5%	0.000

<0.005

DISCUSSION

Acute otitis externa is an infection because of pathogenic bacteria in the ear canal (Rosenfeld et al 2006). The common Pathogenic organisms are *Staphylococcus aureus* and *Pseudomonas aeruginosa* (Prasad and Mohan 2014). The current study compared bacterial flora in patients with acute otitis externa and normal individuals. The G +ve (77.3%), (35.5%) and G -ve (20.1%) (60.0%) pathogenic bacterial flora was isolated in both groups respectively. The P-value of Group A and Group B has significant (<0.005) difference of Pathogenic bacterial flora.

The findings of this study have similar results

with previous studies (Rosenfeld et al 2014). In other study standard mean percentage levels of *Staphylococcus aureus* (45.6%) and *Pseudomonas aeruginosa* (43.1%) was isolated from the external ears of patients with acute otitis externa as compared to the control. Different researchers in their research claimed that *Staphylococcus aureus* and *Pseudomonas aeruginosa* are the main pathogenic bacteria in the cases of acute otitis externa (Sander 2001).

Stroman et al 2001, described in their research that percentage flora of disease causing bacteria was significantly (<0.000) very high in the patients (44% vs. 8.57%) with acute otitis externa than the individuals of control group. They also stated that common microorganisms were *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Bacillus*. In the same pattern present study indicated that isolated bacteria from Group A and Group B were in statistically different proportions.

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