

The Frequency of Underlying Causes and Required Surgical Interventions in Patients with External Ear Chondritis in south west of Iran

MOZAFAR SARAFRAZ¹, MAHSA ABDULAHZADEH² and SOMAYE HARAGHI^{3*}

¹Associated Professor of Otolaryngology, Head and Neck surgery, Hearing & Speech Research Centre, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

²General physician , Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

³Resident of otolaryngology, Head and neck surgery, Hearing & Speech Research Centre, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

*Corresponding author E-mail :savesina@yahoo.com

<http://dx.doi.org/10.13005/bpj/918>

(Received: January 15, 2016; accepted: February 25, 2016)

ABSTRACT

Perichondritis is acute inflammation of the skin and perichondrium, but the changes do not proceed beyond the ear cartilage border. In case of cartilage involvement, chondritis will occur. Clinical signs include severe pain, discharge, erythema, swelling and tenderness. Previous surgical manipulation of the ear, diabetes, and burns are the most important underlying etiologies of this disease. If not treated properly, permanent destruction of cartilage and deformity of the ear is created. This study was designed to study the disease thoroughly in relation to its epidemiologic situation. This retrospective chart review of patients with external ear chondritis, referring to ear, nose, and throat (ENT) ward of Imam Khomeini hospital, Ahvaz, during the years 2002 to 2013 was conducted through a checklist. The information included epidemiologic and treatment data of 130 patients suffering from chondritis. The mean age of patients was 29.8 years. 66.2% were male and 33.8% were female. History of previous surgery was the most common etiology with 52.3% and 53.8% of patients needed surgery during hospitalization. The mean duration of hospitalization was almost 10 days. The most common antibiotic prescribed was ceftazidime in 84.6% of patients. This disease has a significant association with age and sex of the patients. There is also a significant association between underlying etiologies and external ear chondritis. More than half of patients required surgical intervention during hospitalization.

Key words: ear chondritis, etiology.

INTRODUCTION

Perichondritis is acute inflammation of the skin and perichondrium that involves the cartilage of the ear stems. The changes are limited and do not proceed beyond the ear cartilage border. In case of cartilage involvement, chondritis will occur¹. Ear has a very special anatomy and its skin is directly connected to perichondrium and the cartilage is very vulnerable to injuries^{6,16,17}. Common organisms include *Staphylococcus aureus* and

Pseudomonas strains. Less common causes of poisoning include toxic allergic or autoimmune causes¹. In cases of blunt trauma, a hematoma can be formed in the external surface of the ear in the beginning due to infection, such as wrestlers. Penetrating trauma may be due to different injuries, including ear piercing, needle, bites, wounds without a reason (unknown), thermal or chemical burns, and after some surgeries (Mastoidectomy). Diabetes and external otitis are among other predisposing factors for this disease^{5-8,15-17}. Clinical

characteristics include rapid onset of severe pain and pressure, vagueness of auricle borders, swelling of the concha with remarkable sensitivity. Diagnosis through clinical examination¹. If the patient it is not treated, it causes damage to the cartilage and permanent ear deformity¹. The underlying causes mentioned will cause early complications such as chondritis, followed by long-term complications including deformity, hypertrophic scar, discoloration of the ears, hematoma, epidermal cyst, colloid, cervical lymphadenopathy, sepsis, transmission of hepatitis B, C, and HIV^{6,7}. Early treatment includes systemic antibiotics effective against *Staphylococcus aureus*. Auricle and ear canal must be completely cleaned. Ointments containing antibiotics or topical antiseptics should be prescribed. Pain can be controlled with non-steroidal anti-inflammatory drugs¹. Chondritis treatment includes removing any foreign bodies, taking a sample for culturing, and prescribing antibiotics. Frequent assessments are also necessary for draining accumulated hematoma or abscess or removing necrotized cartilage to minimize the damage due to cartilage pressure. It should be noted that empirical antimicrobial therapy for chondritis (piperacillin-tazobactam) should cover *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Antimicrobial treatment should continue for 2-4 weeks^{5,9}. Epidemiologic studies on the diagnosis and treatment of diseases and management strategies play the prime role that lead to accomplishing age, gender, ethnic, economic, and cultural patterns of the disease in the region and focuses the mind on specific target groups in order to reduce disability and economic costs through a detailed plan for screening, diagnosis, and early treatment. Regarding the fact that external ear chondritis is considered a disease with high physical complications and that the ear is the second prominent organ in the face after the nose, it is more susceptible to damage and regarding the cartilage structure of the ear, chondritis can cause deformity by the mentioned underlying causes and due to the special ring structure of cartilage and its being doubled, concordance and symmetry between both organs should be preserved, which makes the remedy difficult¹⁰.

Thus, the importance of this issue has provoked us to assess the frequency, etiologies and

underlying causes, hospitalization duration, and cases needed surgical intervention in a descriptive epidemiologic study in patients suffering from external ear chondritis referring to training hospital of Imam Khomeini, Ahvaz.

METHODS

This study is a descriptive epidemiologic study based on hospital data. The charts, available in the archives of the ear, nose, and throat (ENT) ward of Imam Khomeini Hospital, Ahvaz, were studied and finally 130 cases of external ear chondritis since 2002 to 2013 were reviewed. After reading the cases, a checklist was designed, including age, sex, duration of hospitalization, the need for surgery, antibiotics prescribed during hospitalization, etiologies of the disease, including diabetes, burns, external otitis, blunt trauma, immune deficiency, and history of previous surgeries, including mastoidectomy, piercing the ear cartilage, laceration, and suturing the ears and information was recorded in checklists and for analysis, descriptive statistical methods, including frequency tables, graphs, and numerical indicators were used to describe variables and then chi-square test and logistic regression were used for the association between variables. The significant level was considered 0.05 and SPSS software was used for data analysis.

RESULTS

The mean age of patients was 29.8 years. 53.7% of patients were in the age range of 11-30 years. 66.2% of the patients were men and 33.8% women. The frequency of the underlying etiology of was as follows: 52.3% previous surgeries and ear manipulation, 29.2% burn, 15.3% diabetes, 6.1% external otitis, and 4.6% blunt trauma. Among the hospitalized patients, 72 cases (53.8%) required surgical intervention and underwent incision and debridement. Of those, 54 cases (41.5%) underwent surgery once during hospitalization, 8 (6.2%) twice, 4 (3.1%) three times, four patients (3.1%) four times, and 2 patients (1.5%) five times. Among the injectable antibiotics prescribed, ceftazidime had the highest rate with 84.6%, gentamicin with 60%, ciprofloxacin 29.2%, cefazolin with 16.9%, and clindamycin with 7.7%, respectively. 52.3% of

patients were treated concurrently with the injectable and topical antibiotics. The mean duration of hospitalization was 10.1 days. The mean duration of hospitalization in patients with underlying etiology of diabetes was 13.1 days, burns 12.8 days, previous surgeries and manipulation 9.5 days, trauma 7.6 days, and external otitis 7 days. There was a significant relationship between each of the factors of age ($P=0.04$), sex ($P=0.01$), and the underlying etiology ($P=0.02$) with external ear chondritis. There was also a significant association between the duration of hospitalization of patients and their underlying etiology ($P=0.01$).

DISCUSSION

The mean age of patients in this study was almost 30 years and most patients (27.6%) were in age range of 20-30 years, and 26.1% in the range of 10-20 years. Therefore, this disease has a high prevalence at young age due to the listed risk factors and the incidence of the disease decreases with increasing age. These results are similar to study of Weissler JM [2] and Davidi E [3]; they concluded that the prevalence of the disease is higher in young people.

In this study, 66.2% of patients were male and 33.8% female. So, the male to female ratio is higher in this disease and the disease is more common in men, which is similar to Prasad, HKC's study [20].

In this study, among the listed causes, the majority of patients (52.3%) had a recent history of previous surgery or manipulation of the ear. This suggests that any previous surgery on the ear is a common cause for the occurrence of external ear chondritis in patients. Burns (29.2%), diabetes (15.3%), external otitis (6.1%), and blunt trauma (4.6%), respectively, were the other causes of diseases. This result is consistent with Prasad HKC's study²⁰, in which trauma was the most common underlying etiology with 46%. Respecting the significant association of underlying etiologies with external ear chondritis, any previous surgery, and manipulation, including mastoidectomy,

piercing the ear cartilage, laceration due to trauma, and suturing plays a major role in the incidence of disease in these patients. Thus, the occurrence of such cases should be prevented or at least drastically reduced through giving detailed information about the importance of sterility of any surgical procedure on the external ear, and giving health-medical advice, and emphasizing the fact that patients should visit a doctor quickly if listed symptoms occur.

In this study, 72 patients (53.8%) required surgical procedure during their hospitalization and were admitted to the operating room and underwent incision and debridement. These results are contradictory to study of Davidi E³ and Prasad HKC²⁰, in which no relationship was found between the external ear chondritis and cases who needed surgery.

In this study, among the prescribed injectable antibiotic, ceftazidime had the highest frequency (84.6%), and gentamicin was in the second place (60%).

The hospitalization duration were 1-34 days, with mean length of 10 days and 30.7% of patients were treated in 6-8 days of their hospitalization. These results are dissimilar to Sosin M's study², where the average length of hospital stay was 6.1 ± 4.1 days and no significant relationship was found between the duration of hospitalization and external ear chondritis.

Duration of hospitalization was highest in diabetic patients and lowest in patients with otitis media. Regarding the significant association of hospital length of stay and underlying etiology, it can be concluded that reducing the length of stay, and probable complications, and improving the quality of life of these patients should be accomplished by accelerating the diagnosis of diabetic patients with infectious complications of external ear chondritis and implementing more complete and effective health measures.

REFERENCES

1. Rudolf Probst, Gerhard Grevers, Heinrich Iro. Basic Otorhinolaryngology. 1 st ed. Tehran: *Nasle Farda*;286-301 (1389).
2. Sosin M, Weissler JM, Pulcrano M, Rodriguez ED. Transcartilaginous ear piercing and infectious complications: A systematic review and critical analysis of outcomes. The American Laryngological, Rhinological and Otolological Society, Inc, **10**:1002. Accessed April ,2015 (2015).
3. Davidi E, Paz A, Duchman H, Luntz M, Potasman I. Perichondritis of the auricle: analysis of 114 cases. *Isr Med Assoc J*, **13**: 21-4 (2011).
4. Liu ZW, Chokkalingam P. Piercing associated perichondritis of the pinna: are we treating it correctly?. *J Laryngol Otol*, **127**(5): 505-8 (2013).
5. Flint PA, Haughey BR, Lund VA Cummings Otolaryngology Head and neck surgery(5th ed). 1949 (2008).
6. Hadad SA, Abu Ghazaleh La, Abulail AW. Chondritis and auricular Burn. *King Hussein Medical Center Jerdan*. **37**:75-76 (2009).
7. Razavi BE, Schilling MA. Chondritis attributable to Lactobacillus after ear piercing. *Diagnostic Microbiology and infectious Disease*. **37**: 75-76 (2000).
8. Gary F, John L. Chondritis of the burned ear: A preventable complication. *American jornal of surgery*. **152**: 257-259 (1985).
9. Lee TC, Gold WL. Necrotizing pseudomonas chondritis after piercing of the upper ear. *CMAJ*. **183**: 819-821 (2011).
10. Stephen L, Edwin A. External ear injuries. *JACEP* 7. 233-236 (1978).
11. William E, Markum RN. Out break of Pseudomonas aeruginosa Infections Caused by commercial Piercing of upper Ear cartilage FREE. *JAMA*. **291**(8) 981985 (2004).
12. Kaplan AL, Cook JL. The incidences of Chondritis and perichondritis associated with the surgical manipulation of auricular Cartilage. *Dermatol surg*. **30**(1): 58-62 (2004).
13. Mills DA, Roberts L. Suppurative Chondritis: Its incidence, Prevention, and treatment in Burn patients. *Plastic and reconstructive surgery*.**82**(2):267-276 (1988).
14. Fernande AN, Castro Neto IV. Post-piercing perichondritis. *Rev bras otorrinolaringol*. **74**(6):933-937 (2008).
15. Sand MI, Sand DA. Cutaneous Lesions of the external ear. *Head Face Mad*. 2-4 (2008).
16. Kamal A, Kamel AH. Early management of the Burned Auricle. *Ann Burn and Fire disaster*. **17**:197-200 (2004).
17. Caputo G, Monese C. Conservative Treatment in Auricle burn. *Ann Burn and fire Disaster* **18**: 217-218 (2005).
18. Dowling JA, Foley FD. Chondritis in the burned ear. *Plast Reconstructr Surg*. **42**:115-122 (1968).
19. Shuck JM, Moncrief JA. The management of burns. J , General considerations and sulfamylonmethod. *Curr Probi surg*. 48-50 (2008).
20. Prasad, H.K.C., Sreedharan, S., Prasad, H.S.C., Meyyappan, M.H., Harsha, K.S. Perichondritis of the auricle and its management. *Journal of Laryngology and Otolgy*, **9**: 2014 (2007).