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Seasonal distribution of sudden sensorineural hearing loss

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Abstract

Sudden Sensorineural Hearing Loss (SSHL) is sensorineural hearing loss that occurs in 3 days or less, characterized by 30 dBHL or more, over at least 3 contiguous audiometric frequencies. In this study, we aimed to evaluate the SSHL incidence and its relationship with the seasons retrospectively by examining the patients diagnosed with SSHL in our clinic in the last 10 years. In our study, the files of 1920 patients diagnosed with SSHL in our hospital between January 2000 and December 2019 were analyzed retrospectively. The patients were evaluated separately according to age groups, gender, sudden hearing loss, months and seasons. SSHL was most common in January and October, but this difference was not statistically significant compared to other months ($p>0.05$). When the distribution according to the seasons was examined, it was observed that 28% of patients were in winter, 24% in spring, 26% in autumn and 22% in summer. The difference between seasons was not statistically significant ($p>0.05$). In October, the first month of the autumn season, and January, the first month of the winter season, we can attribute the high rate of SSHL to seasonal transitions. However, a more detailed study is required in this regard. A more precise result could be achieved with data on annual temperature transitions, humidity status and frequency of viral infections, which can only give us a preliminary information.

Keywords: Sudden Sensorineural Hearing Loss, Seasonal, Sensorineural Hearing Loss

Introduction

Sudden Sensorineural Hearing Loss (SSHL) is sensorineural hearing loss that occurs in 3 days or less, characterized by 30 dBHL or more, over at least 3 contiguous audiometric frequencies [1,2]. It is generally seen unilaterally [3]. Although it can be seen in any age group, it makes a significant peak between the ages of 30-60. Its incidence is equal in men and women [4-6]. The incidence of SSHL has been reported as 5 - 20/100000 [1,3,5]. The high spontaneous recovery rate is 40-65% and usually improvement occurs within 2 weeks [5,7].

Although infections (viral-bacterial), neoplasms (acoustic neurinoma, etc.), temporal bone fractures, barotrauma, perilymphatic fistula, ototoxic drug use, immunological and vascular pathologies are responsible for its etiology, etiology is not known in most patients diagnosed with SSHL [3,8]. The relationship between SSHL and infection also brought up the relationship between SSHL and seasons. Many studies have been conducted on whether SSHL is related to the seasons, but consensus has not been achieved as a result of these studies. In this study, we aimed to SSHL from the last 10 years our clinic patients

diagnosed by examining retrospectively in Antalya which is more temperate than in other regions of Turkey SSHL incidence and frequency of assessment of the relationship with the seasons.

Materials and Methods

In our study, the files of 1920 patients who were diagnosed as 'Idiopathic Sudden Sensorineural Hearing Loss' with H91.2 code between January 2000 and December 2019 at the Antalya Training and Research Hospital were analyzed retrospectively. Approval for the study was granted by the Local Ethics Committee of Antalya Training and Research Hospital. Only the first diagnosis of the patients was recorded. Head trauma, temporal bone fractures, intracranial neoplasms, patients previously diagnosed with Meniere's disease or chronic otitis media and patients who had an ear operation, patients who received chemotherapy or radiotherapy were excluded. Patients with no audiogram recorded in the system were excluded from the study. 1814 patients with 30 dBHL or higher Sensorineural Hearing Loss at 3 consecutive frequencies were included in the study. The patients were divided into sub-groups as 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79 and over 80-89 years and were statistically analyzed. The patients were evaluated separately according to age groups, gender, sudden hearing loss, months and seasons. Statistical analysis was made using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY). Data are expressed as n (%) and mean $\pm$ SD (range), as appropriate.

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Results

824 of the patients who were diagnosed with 1724 AIK included in the study were female (45%) and 990 were male (55%). The average age of the patients was 45.9 years. The incidence of SHL between the ages of 10-19 and 80-89 was found to be lower compared to other ages, and the decrease was statistically significant (Figure 1). SHL was most common in January and October, but this difference was not statistically significant compared to other months ($p>0.05$) (Figure 2). When the distribution according to the seasons was examined, it was observed that 28% of patients were in winter, 24% in spring, 26 autumn and 22% in summer. The difference between seasons was not statistically significant ($p>0.05$) (Figure 3).

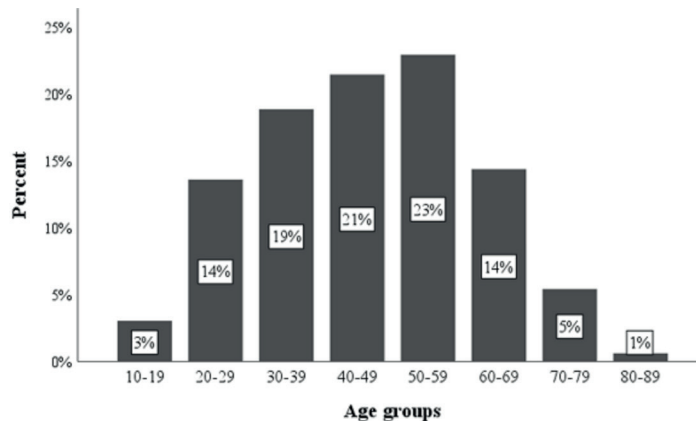


Figure 1: The incidence of hearing loss according to age

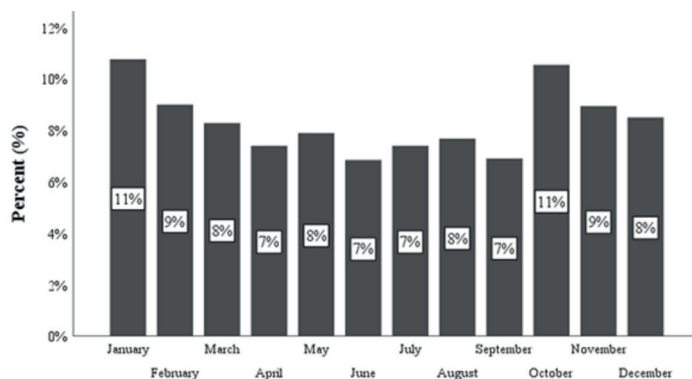


Figure 2: The incidence of hearing loss according to the months

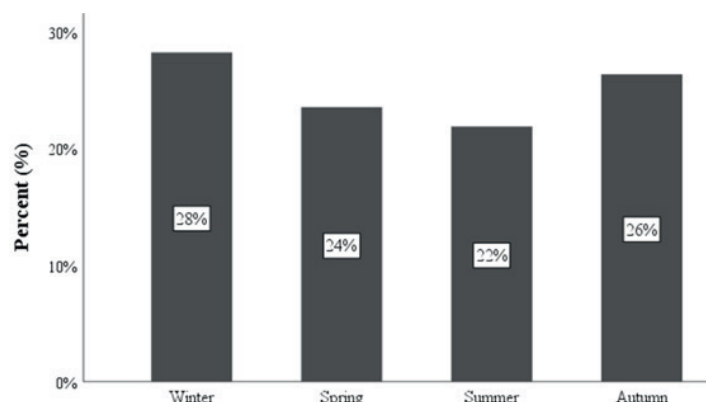


Figure 3: The incidence of hearing loss according to the seasons

Discussion

Although SHL is frequently seen between the ages of 30-60, it is a disease that can be seen in almost any age group and its etiology is still unknown [2,4,9]. The incidence of men and women is equal. In this study, SHL was most frequently between the ages of 30-60. When the subgroups are analyzed, it was seen that 23% in the 50-59 age range, 21% in the 40-49 age range and 19% in the 30-39 age range, respectively. There was no statistically significant difference in the incidence of SHL between genders ($p>0.05$).

Although many reasons are held responsible for the etiology of SHL, its etiology is still not fully understood. In recent years, studies on the relationship between sudden hearing loss and viral infections, seasonal distribution and even diet are on the agenda [1,3,11]. Seasonal ambient temperature not only increasing the risk of infection; It may also affect SHL prevalence by affecting blood pressure, sympathetic activity, blood viscosity, blood clotting time, and serum fibrinogen level [4,12]. However, a full consensus could not be achieved in the studies on SHL and seasons. This may be since the studies were made from selected hospitals and that they were made from certain subgroups of the population [2].

Jourdy et al [3]; In their study in 131 patients followed for 3 years, they did not find a statistically significant difference between SHL and seasons. Danielides et al [11] did not find a statistically significant difference between SHL and seasons in 82 patients they scanned for 5 years. However, in this study, the seasonal SHL incidence was compared only in 3-month periods that were not evaluated every month.

Wu et al [6] scanned 9267 patients diagnosed with SHL all over the country between 1998 and 2002 and reported a high prevalence of SHL in autumn. Chang et al [10] reported in their study in Taiwan that the prevalence of SHL increased in April and October, and this coincided with seasonal transitions in their country.

In our study, we retrospectively analyzed 1814 patients who applied to our hospital and were diagnosed as SHL. Our number of patients is higher than other studies performed in a single hospital. The reason for this is that we are a tertiary hospital and our patients apply for hybrid baric oxygen treatment in our hospital. Therefore, patients diagnosed not only from Antalya city center but also from surrounding hospitals are referred to our clinic. In our study, SHL was most frequently winter (28%) and autumn (26%), but there was no statistically significant difference between the seasons ($p>0.05$). When we look at the months, the most common diagnosis was made in October and January, but there was no statistically significant difference between the months ($p>0.05$). In October, the first month of the autumn season, and January, the first month of the winter season, we can attribute the high diagnosis of SHL to seasonal transitions. However, a more detailed study is required on this subject. The annual temperature transitions, humidity status and frequency of viral infections may differ from each other. This can change the seasonal characteristics of each year. This study may be a preliminary study for the province of Antalya, but a more comprehensive study is required with all these data.

Conclusion

There is no consensus yet on the relationship between SHL and the seasons. This can be attributed to the seasons' temperatures and humidity not being the same every year. More studies are needed on this subject.

Conflict of interest

The authors declare that they have no competing interest.

Financial Disclosure

All authors declare no financial support.

Ethical approval

Approval for the study was granted by the Local Ethics Committee of Antalya Training and Research Hospital. .

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