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Original Research

Incidence of sensorineural hearing loss among Vitiligo patients: An observational study

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ABSTRACT:

Background: The present study was conducted for assessing the incidence of sensorineural hearing loss among Vitiligo patients. **Materials & methods:** The current investigation was undertaken with the primary objective of evaluating the prevalence and characteristics of sensorineural hearing loss (SNHL) among individuals diagnosed with vitiligo, a chronic autoimmune pigmentary disorder. A total of 50 clinically confirmed vitiligo patients were recruited for the study. All participants underwent thorough ENT. Pure Tone Audiometry and Otoacoustic Emission were done. SNHL was evaluated. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software. **Results:** Mean age of the vitiligo patients was 38.3 years. Majority proportion of patients was males and was of rural residence. VASI score was 1.356. Incidence of SNHL with PTA and with OAE was 18 percent and 24 percent respectively. **Conclusion:** Vitiligo is a condition associated with significant morbidity. Significant proportion of vitiligo patients are accompanied with SNHL.

Key words: Vitiligo, Sensorineural

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INTRODUCTION

Vitiligo is a common disorder in which the melanocytes of the skin are injured. Vitiligo often affects children and young adults, as the incidence of the disease declines with age. The disease prevalence is 0.5–1% in the general population. Vitiligo is characterized by the appearance of white macules on skin and hair in the hypopigmentary area. The lesions may also appear around nevi or melanoma of the skin.[1, 2]The occurrence of vitiligo has been associated, in some cases, with physical or emotional stress, and more rarely with drugs and industrial chemicals. The precise cause of vitiligo remains unknown. Various theories such as autoimmune, genetic, autocytotoxic and neural hypotheses have been proposed. Melanocytes are found not only in the skin but also in the leptomeninges, retinal pigment epithelium, the uveal tract and the inner ear. The role of the melanocytes in the inner ear is not completely understood. It is known that they are necessary for the normal development and function of the striavascularis. Audiologicalabnormalities have been described in hypopigmentary disorders such as albinism, Wardenburg's syndrome, Vogt-Koyanagi-Harada syndrome, and Alzendrini syndrome. Evidence of sensorineural hearing loss (SNHL) in vitiligo patients has been reported over the last decade.[3, 4] Hence; the present study was conducted for assessing the incidence of sensorineural hearing loss among Vitiligo patients.

MATERIALS AND METHODS

The current investigation was undertaken with the primary objective of evaluating the prevalence and characteristics of sensorineural hearing loss (SNHL) among individuals diagnosed with vitiligo, a chronic autoimmune pigmentary disorder. A total of 50 clinically confirmed vitiligo patients were recruited for the study. Detailed demographic profiles—including age, sex, residence, occupation, and socioeconomic status—were documented for each participant. Additionally, comprehensive clinical histories were obtained to evaluate disease duration, extent of cutaneous involvement, family history of vitiligo or autoimmune disorders, and the presence of any comorbid systemic illnesses. Specific attention

was paid to auditory symptoms such as tinnitus, ear fullness, vertigo, or subjective hearing impairment. All participants underwent thorough ENT. Pure Tone Audiometry and Otoacoustic Emission were done. SNHL was evaluated. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

RESULTS

Mean age of the vitiligo patients was 38.3 years. Majority proportion of patients was males and was of rural residence. VASI score was 1.356. Incidence of SNHL with PTA and with OAE was 18 percent and 24 percent respectively.

Table 1: VASI

VASI	Value
Mean	1.356
SD	0.39

Table 2: SNHL with PTA and OAE

SNHL	Number	Percentage
With PTA	9	18
With OAE	12	24
Total	50	100

DISCUSSION

The striavascularis of the cochlea is responsible for creating the endocochlear potentials, which are essential to the mechanical transduction of cochlear hair cells. The stria is composed of 3 main cell types: the marginal cells, the basal cells and the intermediate cells, known as melanocytes. As melanin is thought to have an antioxidative ability protecting cochlear hair cells from noise injury, medications, and agerelated hearing loss, the lack of melanin, as in vitiligo, is expected to cause SNHL, with a correlation to environmental injury and the degree of lack of melanin.[6- 9]Hence; the present study was conducted for assessing the incidence of sensorineural hearing loss among Vitiligo patients.

Mean age of the vitiligo patients was 38.3 years. Majority proportion of patients was males and was of rural residence. VASI score was 1.356. Incidence of SNHL with PTA and with OAE was 18 percent and 24 percent respectively. Fleissig E et al determined the prevalence of hearing loss and vestibular symptoms among Israeli vitiligo patients as compared with healthy controls. 16 vitiligo patients and 16 healthy controls were enrolled in this prospective study. Vitiligo patients had undergone dermatologic evaluation and complete ENT evaluation. Vitiligo patients demonstrated a significantly higher prevalence of sensorineural hearing loss (SNHL) ($p = 0.001$). A 'notch'-shaped audiogram was the most frequent type of audiogram found among vitiligo patients ($p = 0.021$). Patients with mucosal involvement as the primary site of onset had a significantly more normal hearing level ($p = 0.004$). Due to the high prevalence of SNHL amongst vitiligo patients, it is recommended that these patients undergo a complete hearing evaluation, avoiding ototoxic hazards if possible.[10] Hong CK et al assessed the hearing differences between Korean vitiligo patients and normal subjects. Pure tone audiometry, auditory brainstem response, and electrocochleography results from 89 vitiligo patients, 47 with active disease and 42 with stable disease, and 89 healthy subjects, were compared. Pure tone thresholds in both vitiligo subgroups were significantly lower than in the control group at 1,000, 4,000, 6,000 and 8,000 Hz ($p < 0.05$). Pure tone thresholds in the active disease group were significantly lower than in the stable disease group at 1,000, 2,000, 4,000, 6,000 and 8,000 Hz ($p < 0.05$). Vitiligo patients had a significant decrease in peak I latency and significant increases in peak III and interpeak I-III latencies compared with controls. Compared with the stable disease group, the active disease group had a significant decrease in peak I latency and significant increases in interpeak I-III and interpeak I-V latencies ($p < 0.05$).

Electrocochleography showed that vitiligo patients had significant increases in summation potential (SP) amplitude, action potential (AP) amplitude in the left ear, and SP/AP ratios in both ears, compared with controls ($p < 0.05$). In conclusion Korean patients with vitiligo show hearing loss compared with controls, which may be caused by functional disorders of intermediate cells (melanocytes) of the stria vascularis.[11]Aydogan K, et alinvestigated the subclinical abnormalities of melanin-containing cellular elements of the auditory system in patients with vitiligo. They studied the conventional audiometric investigations and brainstem auditory evoked responses (BAERs) of 57 active patients with vitiligo and 50 healthy human subjects. The I, III and V latencies, and I-III, III-V and I-V interpeak latencies (IPL) between the groups were compared. A mild degree of sensorineural hypoacusis was found in eight patients with vitiligo (14%), whereas no controls demonstrated abnormal audiological results ($P = 0.006$). A statistically significant increase in both ears of the third peak latency ($P = 0.02$, $P = 0.01$, respectively) and IPL I-III ($P = 0.04$, $P = 0.008$, respectively), and a significant increase of the fifth peak latency in the right ear ($P = 0.04$) were found, compared with controls, but no differences were found for other latencies and IPLs. Melanin may play a significant role in the establishment and/or maintenance of the structure and function of the auditory system and may modulate the transduction of the auditory stimuli by the inner ear.[12]Angrisani RM et al study the incidence of hearing alterations in patients with vitiligo. Prospective audiological evaluation, transient-evoked otoacoustic emission recordings and study the effects of suppression in 24 patients with vitiligo. Their ages ranged from 15 to 45 years. 21 patients (87.5%) had normal audiometry; 2 had unilateral hearing loss in the high frequencies and

1 had cochlear moderate hearing loss in the left ear. Of these 21 subjects, 66.7% had no otoacoustic emissions, suggesting cochlear dysfunction. Only 7 patients had otoacoustic emissions present in all frequencies (29.2%) and 17 (70.8%) did not have them, and the highest rate of no otoacoustic emissions happened in the right ear of males. Regarding the suppression study, 6 subjects failed, all of them were females, and their left ears were the most affected. The findings show that patients with vitiligo, particularly males, have a greater predisposition to cochlear dysfunction, especially in the right ear. As far as the suppression effect was concerned, there was a greater alteration in the female efferent system, particularly in the left ear. Hearing alterations did not vary as far as age is concerned, type of vitiligo and time of disease progression.[13]

CONCLUSION

Vitiligo is a condition associated with significant morbidity. Significant proportion of vitiligo patients are accompanied with SNHL.

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