

Original article:

Assessment of Role of Calcium Deficiencies in Otolaryngeal Disease: An Observational Study

Anwar Ali¹, F.H. Gauri², Ikram Hussain³, Nusrat Gauri⁴

¹Principal Specialist (MS, ENT), ²Principal Specialist (M.D. Medicine), ³Junior Specialist, (M.D. Pediatrics),

⁴SMO (B.D. S.), Government D.B. General Hospital, Churu, Rajasthan, India.

Corresponding author: Dr. F.H. Gauri

Abstract

Background: Traditionally, treatment of the ear — otology — was associated with that of the eye in medical practice. With the development of laryngology in the late 19th century, the connection between the ear and throat became known. Many people associate otolaryngologists with the treatment of ear infections, hearing loss and sinus problems.

Hence; we planned the present study to evaluate the role of calcium deficiency in Otolaryngeal Disease.

Materials & methods: The present study included evaluation of patients with Otolaryngeal Disease. A total of 44 patients were included in the present study. The patients attending outpatient of department of ENT with various complaints and not responding to conventional treatment were advised for assessment of calcium levels and vitamin D [25 (OH)D] level in blood. Complete demographic details of all the patients along with treatment outcome were recorded. All the results were analyzed by SPSS software.

Results: A total of 44 patients were included in the present study, out of which 28 were males while the remaining 16 were females. Mean age of the patients was 15.8 years. 7 patients had calcium level less than 26 nmol/ml, while 6 patients had calcium level of less than 9 mg/dL.

Conclusion: Among ENT patients, the incidence and prevalence of calcium and vitamin D deficiency is extremely common.

Key words: Calcium, Deficiencies, Otolaryngeal

Introduction

Within the structures of the ear, nose and throat are complex and interrelated mechanisms that allow a person to make sound, hear, maintain balance, smell, breathe, and swallow.^{1, 2} Traditionally, treatment of the ear — otology — was associated with that of the eye in medical practice. With the development of laryngology — the study of the throat — in the late 19th century, the connection between the ear and throat became known. Thus the birth of a discipline called otolaryngology.^{3,4} Many people associate otolaryngologists with the treatment of ear infections, hearing loss and sinus problems. Otolaryngology actually encompasses the treatment of many diverse conditions,

including: dizziness, facial plastic and reconstructive surgery, head and neck cancer, hearing loss, problems of the larynx and sinus, difficulties swallowing, tumors of the auditory nerve, and voice production.^{5,6}

The role of vitamin D in prevention of respiratory tract infection, cochlear deafness or demineralization of bone is gathering evidence hence this study was conducted to evaluate the incidence of Vitamin D deficiency in out-door patients of otoryngology clinic with various symptoms and signs of E.N.T and related diseases.^{7, 8}Hence; we planned the present study to evaluate the role of calcium deficiency in Otolaryngeal Disease.

Materials & methods

The present study was planned in the department of ENT of Government D.B. General Hospital, Churu, Rajasthan, and included evaluation of patients with Otolaryngeal Disease. Ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. A total of 44 patients were included in the present study. Inclusion criteria for the present study included:

- Patients upto 50 years of age
- Patients with chief complaint of pharyngitis, Chronic Suppurative Otitis Media, Cholesteatoma or Upper respiratory tract infection (URTI)
- Patients with negative history of any systemic illness,
- Patients with negative history of any known drug allergy

The patients attending outpatient of department of ENT with various complaints and not responding to conventional treatment were advised for assessment of calcium levels and vitamin D [25 (OH)D] level in blood. Complete demographic details of all the patients along with treatment outcome were recorded. All the results were analyzed by SPSS software. Chi- square test and one way ANOVA were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

Results

A total of 44 patients were included in the present study, out of which 28 were males while the remaining 16 were females. Mean age of the patients was 15.8 years. 7 patients had calcium level less than 26 nmol/ml, while 6 patients had calcium level of less than 9 mg/dL. Chief complaints observed in patients of the present study included sore throat and URTI.

Discussion

In the present study, we observed that hypocalcaemia was present in significant population of patients. Taneja MK et al observed the prevalence of deficiency of vitamin D in out-patients of otolaryngology clinic at Indian Institute of ear diseases, Muzaffarnagar. The patients attending outpatient of otolaryngology clinic with various complaints and not responding to conventional treatment were advised for assessment of vitamin D [25 (OH)D] level in blood. The age, sex, occupation, colour of skin, chief complaints, obesity, provisional diagnosis, and incidence of sun exposure was noted in all cases. A total of 86 patients were examined, maximum patients were in the age group of 7–15 years. The chief complaints in majority of the patients were sore throat with recurrent upper respiratory tract infection. Only in three patient's vitamin D level was found to be within normal limits. In rest 83 (96.51 %) it was either deficient 57 (66.28 %) or insufficient 21 (24.42 %). The incidence of vitamin D deficiency is extremely common in Ear Nose Throat disease (E.N.T.) patients. The results of vitamin supplementation were promising in cases of benign paroxysmal positional vertigo with cervical spondylosis and URTI with asthma, empirical supplementation of vitamin D in all E.N.T. patients not responding to conventional treatment is worth trying. At place of sun screen, use of pomegranates and blueberries may be encouraged to prevent sunburn and eliminate Vitamin D deficiency.⁹ Bartley J et al performed a prospective observational study to estimate the prevalence of vitamin D deficiency in patients attending a general otolaryngology clinic in South Auckland, New Zealand. They assessed vitamin D status of patients by measurement of their plasma 25-hydroxyvitamin D [25(OH)D] level. Of 48 patients, 2% had 25(OH)D levels of

17.5 nmol/L or less (a level associated with osteomalacia), 58% had 25(OH)D levels of 50 nmol/L or less (a level associated with vitamin D deficiency), and 100% had 25(OH)D levels of 80 nmol/L or less. Most of the patients attending a general otolaryngology clinic in South Auckland are vitamin D-deficient. It is unclear whether low vitamin D levels are associated more directly with otolaryngological disorders or skin type, because the small size of this study and the broad range of conditions seen precluded a meaningful statistical analysis.¹⁰

Taneja MK et al, from their study, concluded that adequate serum level of vitamin D (Serum 25 (OH) D) is essential; its deficiency may lead to recurrent respiratory tract and ear infection, which may end up with significant morbidity in terms of hearing loss, poor language, communication, and mental health. The serum 25 (OH) D levels below 30 ng/ml are considered as deficient and below 10 ng/ml as grossly deficient. The emerging consensus is that vitamin D level below 80 nmol/L should be labeled as insufficient. The provitamin D can be procured from fortified dairy products, cereals, oily fish, and fish liver oil. Vitamin D synthesized or absorbed from the gut is hydroxylated to its active form in the liver, hence may be low where absorption or liver function are affected/inadequate, hence in cases of recurrent otitis media/cholesteatoma, estimation and supplementation of vitamin D is hallmark in their management.¹¹ Animesh AU et al observed the

prevalence of deficiency of vitamin D and Calcium in outpatients of otolaryngology clinic at R.C.S.M Government Medical College Kolhapur, India. The patients attending outpatient of otolaryngology clinic with various complaints and not responding to conventional treatment were advised for assessment of vitamin D [25 (OH) D] level in blood. The age, sex, occupation, chief complaints, obesity and provisional diagnosis was noted in all cases. A total of 86 patients were examined, maximum patients were in the age group of 7–15 years. The chief complaints in majority of the patients were sore throat with recurrent upper respiratory tract infection. Only three patient's vitamin D levels were found to be within normal limits. In the remaining 83 (96.51 %) cases it was either deficient (as in: 57 (66.28 %)) or insufficient (as in 21 (24.42 %)). The incidence of vitamin D deficiency is high in Ear Nose Throat disease (E.N.T.) patients. The results of vitamin supplementation were promising in cases of Pharyngitis, URTI with asthma, post operation of Chronic Suppurative Otitis Media, empirical supplementation of vitamin D in all E.N.T. patients not responding to conventional treatment is worth trying.¹²

Conclusion

From the above results, the authors concluded that among ENT patients, the incidence and prevalence of calcium and vitamin D deficiency is extremely common. However; future studies are directed for better exploration of this field of ENT.

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Table 1: Demographic details of the patients

Parameter	No. of patients
Mean age (years)	15.8
Males	28
Females	16

Table 2: Serum vitamin D levels

Serum vitamin D levels	No. of patients
Less than 10 nmol/ml	3
10- 25 nmol/ml	4
26- 50 nmol/ml	25
More than 50 nmol/ml	12

Table 3: Serum calcium levels

Serum calcium levels	No. of patients
< 9 mg/dL	6
9-11 mg/dL	24
> 11 mg/dL	4

Table 4: Chief complaints of patients

Chief complaint	No. of patients
Sore throat	18
URTI	10
Others	16