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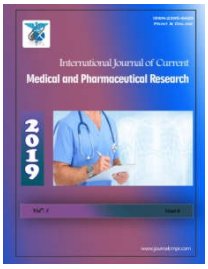

Research Article

ASSOCIATION OF SENSORINEURAL HEARING LOSS WITH SOCIOECONOMIC STATUS IN CHILDREN AGED 2-12 YEARS

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ABSTRACT

Aims: To find the association of SNHL with socioeconomic status in children aged 2-12 years coming from central area of Uttar Pradesh.
Settings and Design: This study has been carried out in the Department of Physiology, KGMU, Lucknow, UP, India. This is a cross sectional study.
Methods and Material: A total 70 subjects were enrolled in this study. Out of total, 35 subjects (50%) had moderate to severe hearing loss while remaining (n=35;50%) had severe to profound hearing loss. Informed consent was filled by the parents of each subject and working proforma included age, sex and socioeconomic status (according to Kuppuswamy classification, 2018) was also filled. SPSS Version 21.0 statistical analysis software was used.
Results: The patients age ranged from 02-10 years with a mean age of 4.67±2.15 years. Male: female ratio was 36(65.7%):24(34.3%). Proportion of severe to profound impairment group (77.1%) was higher in lower upper and lower socioeconomic strata. Proportion of moderate to severe impairment group (57.1%) was higher in lower middle class yet this difference was not significant statistically (p=0.149).
Conclusions: Lower socioeconomic status, in the form of occupation and education, is associated with higher risk of SNHL. A study with a larger sample is required to make any definite inference between SNHL and socioeconomic status of patient.

INTRODUCTION

Hearing is a physiological process which helps to understand the world around us and to interact with each other. Hearing impairment is the most frequent sensory deficit in human populations and affects newborns, children, adults, and the elderly.[1-5] Its incidence varies in each population segment, affecting 10% of children and increasing to 30% of the population over 65 years.[3] Hearing impairment has devastating consequences for interpersonal communication, psychosocial well-being, quality of life and economic independence.[6-8]

Few reports have recently suggested the role for nutritional status in hearing impairment. Indeed, decreased levels of essential nutrients, such as several vitamins, have been shown to correlate with hearing loss.[9-14] Among micronutrients, reduced folic acid concentrations have been found in sudden sensorineural hearing loss (SNHL). People belonging to low socioeconomic status are more prone to develop SNHL due to poor nutritional status and delay in diagnosis due to socioeconomic reasons. Severity of hearing loss has been graded according to WHO criteria.[15] (Table-1).

Objectives

To find the association of SNHL with socioeconomic status in children aged 2-12 years coming from central area of Uttar Pradesh.

MATERIAL AND METHODS

Study Design- Cross–sectional descriptive study

Study Duration- November 2017 to August 2018

Inclusion Criteria

1. Children aged 2-12 years irrespective of sex.
2. Diagnosed cases of SNHL.
3. Referred from Department of Otorhinolaryngology to Neurophysiology Lab in Department of Physiology

Exclusion Criteria

1. Children less than 2 years or more than 12 yrs.
2. Children who have conductive deafness, discharge, CSOM and any other systemic and metabolic disorders.

Methodology

The sample size was calculated using the following formula Charan and Biswas (2013).[16] Total of 70 children falling in

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sampling frame were enrolled in the study and divided into two groups (children having moderate to severe hearing loss and severe to profound hearing loss) on basis of severity of hearing loss (based on WHO criteria). Ethical clearance was taken from the Ethics Committee of KGMU, Lucknow before the start of the study.

Informed consent form was filled by parents of each subject and working proforma included age, sex and socioeconomic status (according to Kuppuswamy classification, 2018)was also filled.[17] (Table-2)

Statistical Analysis

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 21.0 statistical Analysis Software.

RESULTS

(Table-3) shows general profile and clinical characteristics of patients enrolled in the study. Age of patients ranged from 2to10 years with a mean age of 4.67±2.15 years. Male to female ratio was 36(65.7%): 24 (34.3%). Exactly half (n=35;50%) had moderate to severe hearing impairment while remaining half (n=35; 50%) had severe to profound hearing impairment. Majority belonged to upper lower socioeconomic class (n=38; 54.3%) followed by those from lower middle (n=22;31.4%), lower (n=9;12.9%) and upper middle (n=1;1.4%) class respectively. Comparison of demographic Profile between two group of hearing impairment is showen in (Table 4).

Proportion of severe to profound impairment group (77.1%) was higher in lower upper and lower socioeconomic strata. Proportion of moderate to severe impairment group (57.1%) was higher in lower middle class yet this difference was not significant statistically (p=0.149).

DISCUSSION

In our study age of patients ranged from 2 to 12 years with a mean age of 4.67+2.15 years Proportion of severe to profound impairment group (77.1%) was higher in lower upper and lower socioeconomic strata. Proportion of moderate to severe impairment group (57.1%) was higher in lower middle class yet this difference was not significant statistically (p=0.149).

As upper lower class is more educated and more aware compare to lower middle class, so they reported early to the hospital. Although this was not statistically significant, this may be due to low socioeconomic status, low education and lower class occupation as they are not able to cope up the all the nutritional requirements which are necessity for development of children.

Engdahl Balso found that hearing loss was associated with socioeconomic status, in the form of occupation and education.[18]In study of Ping He et al in Chinese population, the association between socioeconomic status and hearing loss in adults of working age from a population-based survey in China. They found that lower socioeconomic status was associated with higher risk of hearing loss in both urban and rural areas.[19] Their findings showed that lower clas occupation was correlated with higher level of hearing loss, which is consistent with other research also.[20] Similar findings has been reported by Agrawal Y et al.[21]

CONCLUSIONS

Lower socioeconomic status, in the form of occupation and education, is associated with higher risk of SNHL. A study with a larger sample is required to make any definite inference between SNHL and socioeconomic status of patient. Children and their parents should be educated at school level regarding importance of nutrition to lessen the severity and prevalence of SNHL.

Limitations of the study

Being a cross-sectional descriptive study and small sample size, it do not permit us to make any definite inference between SNHL and socioeconomic status of patient.

Conflicts of interest: None

Table 1 Severity of Hearing Loss in Decibels (dB)

Severity of Hearing loss	Hearing Threshold (dB)
Moderate to Severe Hearing loss	40-70 dB
Severe to Profound Hearing loss	71-90 dB

Table 2 Modified Kuppuswamy Socioeconomic scale updated for January 2018 (a) Occupation of the Head of the Family

Sr. No.	Occupation of the Head	Score
1	Legislators, Senior Officials & Managers	10
2	Professionals	9
3	Technicians and Associate Professionals	8
4	Clerks	7
5	Skilled Workers and Shop & Market Sales Wurlers	6
6	Skilled Agricultural & Fishery Workers	5
7	Craft & Related Trade Workers	4
8	Plant & Machine Operators and Assemblers	3
9	Elementary Occupation	2
10	Unemployed	1

(b) Education of the Head of the Family

Sr. No.	Education of the Head	Score
1	Profession or Honours	7
2	Graduate	6
3	Intermediate or diploma	5
4	High school certificate	4
5	Middle school certificate	3
6	Primary school certificate	2
7	Illiterate	1

(c) Total Monthly Income of the Family

Sr. No.	Updated Monthly Family Income in Rs. (2012)	Updated Monthly Family Income in Rs. (2016)	Updated Monthly Family Income in Rs. (2018)	Score
1	>30375	> 40,430	>126,360	12
2	15188-30374	20,210-40,429	63,182-126,356	10
3	11362 15187	15,160 20,209	47,266 631 78	6
4	7594 1 1361	10,110 15,159	31,591 47262	4
5	4556 7593	6060 10,109	18,953 31589	3
6	1521 4555	2021 6059	6327 18949	2
7	si 520	< 2020	<6323	1

(d) Kuppuswamy's Socio-Economic Status Scale 2018

Sr. No.	Score	Socioeconomic Class
1	26 29	Upper (I)
2	16 25	Upper Middle (II)
3	11 15	Lower Middle (III)
4	5 10	Upper Lower (IV)
5	< 5	Lower (V)

Table 3 General Profile and Clinical Characteristics of Patients (n=70)

SN	Characteristic	Statistic
1.	Mean Age±SD (Range) in years	4.67±2.15 (2-10)
	Sex	
2.	Male	46 (65.7%)
	Female	24 (34.3%)
	Type of hearing impairment	
3.	Moderate to severe	35 (50.0%)
	Severe to profound	35 (50.0%)
	Socioeconomic Status	
	Upper middle	1 (1.4%)
4.	Lower Middle	22 (31.4%)
	Upper Lower	38 (54.3%)
	Lower	9 (12.9%)

Table 4 Comparison of Demographic Profile between two group of hearing impairment

SN	Characteristic	Moderate to severe impairment (n=35)	Severe to profound impairment (n=35)	Statistical significance
1	Socioeconomic Status Upper middle Lower Middle Upper Lower Lower	0 (0%) 15 (42.9%) 17 (48.6%) 3 (8.6%)	1 (2.9%) 7 (20.0%) 21 (60.0%) 6 (17.1%)	χ^2=5.330; p=0.149

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