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Original Research Article

Clinical and socio-demographic profile of children with hearing impairment who had undergone cochlear implant surgery

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ABSTRACT

Background: The aim was to analyze the clinical and socio-demographic profile of children with hearing impairment who had undergone cochlear implant surgery in a tertiary care centre in central India.
Methods: This was a retrospective study conducted in Department of Pediatrics, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh during the period from January 2014 to December 2017 to find out clinical and socio-demographic profile of cochlear implant patient.
Results: A total of 114 patients have been operated via posterior tympanotomy (MPTA) approach at present centre. Out of which 61(54%) were males and 53(47%) were females with a mean average age 5 years and 11 months. The number of patients with right ear defect were 107 (93%) whereas with left ear were as low as 7 (6%). Most of the patients with cochlear disease were from lower socio-economic class and was not highly educated who lived in rented or kachcha houses. They were mostly living in big families with limited space with minimum earnings. 90% of the total patients had normal siblings with no deafness and only family had previous deaf child whose male baby was operated.
Conclusions: Present study highlights that problem of hearing impairment is prevalent in population. Although treatment for this condition is freely available under Government scheme, but lack of awareness results in late presentation to facilities. There is a need to spread awareness amongst the population and regular screening at birth.

Keywords: Cochlear disease, Cochlear implant, Deaf, Tympanotomy

INTRODUCTION

Ear is the "doorway to the brain" for sound and hearing is a perception of sound detected by ear. Hearing loss refers to hearing loss greater than 40dB in the better ears in adults (>15 years) and greater than 30dB in children in better ear (0-14 years). Around 5.3% of the world population has hearing loss and out of this 9% (32million) are children.[1,2] Estimated incidence of hearing loss is 4.8% in children 0-1 year and 6.4% in 1-4 age group.[3] Prevalence of severity of hearing loss depends upon factors including socioeconomic status, ear infection and consanguinity. Prevalence for disability hearing loss in children is highest in South-Asia region followed by Subsaharan Africa. Prevalance of hearing impairement is greater in regions of low and middle income and is proportionally related to age and male sex.[4] Lower income and increasing age lead to increased incidence of hearing loss. Delay in diagnosis leads to severe to profound sensorineural hearing loss (SNHL) in children leads to delay in understanding the speech and produce intelligible speech and future employment opportunities.[5] Hearing disability in children causes adverse effects on language acquisition, restricted academic achievements and sound opportunities leading to damage in social, psychological and professional life.[6]

This study is an attempt to find out the out clinical and socio-demographic profile of cochlear implant patient in present hospital.

METHODS

This study was approved by the Institutional Ethical Committee to find out Clinical and Socio-Dermographic profile of Cochlear Implant patient. This was a retrospective observational study was conducted in Department of Pediatrics, Chirayu Medical College and Hospital, Bhopal, Madhya Pradesh during the period from January 2014 to December 2017. The medical records of all children between 06-5 years who were admitted with a diagnosis of hearing loss in the time period between January 2014 to December 2017 were evaluated. Children who under-went cochlear implant surgery. Data collected of the study group was age, sex, time of presentation, site of operation, complications encountered and decision maker for operation with socio-demographic profile. Well written consent was taken with parents and clearance from the Institutional Ethical Committee was taken for the study.

Inclusion criteria

- All patients with severe to profound SNHL with age <5 years and with no perinatal problems, hyper-bilirubinemia, meningitis, LBW/PT and other etiological presently associated with SNHL.

Exclusion criteria

- All patients with age >5 years, congenital anomalies/disabilities and with prior implants (bone-conduction/electro-acoustic and auditory brainstem implant) were excluded.

Statistical analysis

Statistical analysis was performed by SPSS programme by window version 17.0. SPSS Inc. Chicago, IL, USA. The P value <0.05 indicated statistical significance.

RESULTS

A total of 114 patients were operated in Chirayu medical college during the study period. All 114 patients have been operated via posterior tympanotomy (MPTA) approach. Most of the patients with cochlear disease were from lower class and was not highly educated who lived in kachcha houses. They were mostly living in big families with limited space with minimum earnings. 90% of the total patients had siblings without any deafness. One family had previous deaf child whose male baby was operated. The number of patients implanted (operated) on right side were 107 (93%) whereas on left side were as low as 7 (6%). Some socio-demographic factors associated with cochlear implant patients were studied in the 114 patients and correlation amongst them was found.

Table 1 gives the parameters and characteristics of the study population. Other factors inquired were previous deaf person, socioeconomic status, decision making power in the household and previous living issues. It was also observed that out 114 patients 94(82%) were Hindu and rest 20(18%) were non-Hindu in religion while 45(39.5%) patients were from Bhopal city and rest 69(60.5%) from adjoining areas.

Table 1: Comparison of socio-demographic characteristic of factors associated with cochlear implant patients.

Variables	Group	Number	%
Gender	Male	61	53.5
	Female	53	46.5
Siblings	None	12	10.5
	Female	27	23.7
	Male	27	23.7
	Multiple	48	42.1
Implanted Site	Left	7	6.14
	Right	107	93.85
Income	>1Lac	7	6.1
	50k-1Lac	57	50
	50k-25k	49	42.98
	<25k	1	0.87
Residence	Bhopal	45	39.5
	Outside	69	60.5
Education (Father)	<10th	29	25.4
	10th	23	20.2
	12th	34	29.8
	Graduate	20	17.5
	Post grad	4	3.5
	Illiterate	4	3.5
House	Kachcha	7	6.1
	Pakka	20	17.5
	Mud	40	35.1
	Rent	47	41.2
Consent	Grandfather	3	2.6
	Uncle	1	0.87
	Mother	19	16.6
	Father	91	79.8

DISCUSSION

Inspite of newborn hearing screening very common still there is huge burden of deafness in the world especially in Sub Asian continent. Universal neonatal screening for hearing loss should be adopted and made mandatory for all births in the country to pick early cases of hearing loss. Still there is very large population in India who lives in rural areas and where institutional delivery and neonatal screening programme is not a very common practice. Cochlear implantation is the standard of care for treatment of severe to profound, sensorineural hearing loss.[7,8] CI are auditory prosthesis are designed to link an internal device that is interfaced with cochlear nerve to an external device which uses a specific speech coding strategy to translate acoustic information into electric

stimulation.CI has become a standard procedure for rehabilitation of profoundly deaf post lingual adults and pre lingually and post lingually deafened children. Implantation at early age results in best auditory verbal outcomes. Speech perception in children after Cochlear implant depends upon several factors including demographic and hearing character and features of implant. Critical period for language development in children with profuse SNHL is <3.5-5 years of age then best opportunity to learn language is during the first 3yrs of life. In present study there is male prodominence of children who received cochlear implant 61(54%).[4] In the present study the main cause of sensori-neural deafnes remains unknown unlike other studies which shows some particular diagnosis.[9,10] Within present study set up genetic testing was not done otherwise detailed history was taken to rule out any possible etiology. Analysis of socio-economic profile of parents whose child underwent cochlear implant showed those fathers were educated mostly up to middle school while largely all mothers were educated below fifth standard. Most of the fathers were employed non-professional jobs (farmer) and all mothers were housewife. Mostly all family belong to low socio-economic class (<50000 rupees per annum). Literature shows from major to minor complications in cochlear implant surgery although most of them are transient while a few need intensive cares.[11] Complications seen immediately after CI surgery are facial paralysis, meningitis, local infection, tinnitus, vertigo and electrode misplacement but in present study authors had encountered minor complication in 3 patients with headache and dizziness (minor complication). Outcome of the CI patient is not entirely predictable as multiple factor plays an important role in their development. These factors might be changed according to the need of the patient to achieve best result. Wiley et al reported improvement in communication skill after cochlear implantation.[12] Post CI all children showed significant improvement in auditory skills and speech perception in present study.

CONCLUSION

Universal Neonatal Screening for hearing loss is adopted by most hospitals in urban India, however still it is not accepted as standard practice. As per present study the prevalence of hearing loss has been found to be higher amongst lower socio-economic group therefore stress should be given on creating awareness in this section of the society. Authors recommend routine screening in all newborn, which would help in early detection and early implantation of CI. As longer the period of hearing loss continues, child may never make up the lost learning even with extensive rehabilitation.

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REFERENCES

1. World Health Organization, 2012. Global Estimates on Prevelances of Hearing Loss. Available at: http:/www.who.int/pbd/deafness/WHO_GE_HL,pdf
2. Mathers C, Smith A, Concha M. Global burden of hearing loss in the year 2000. Glob Burd Dis. 2000;18:1-30.
3. Sanderson G, Ariyaratne TV, Wyss J, Looi V. A global patient outcomes registry: cochlear paediatric implanted recipient observational study (COCHLEARTM P-IROS). BMC Ear Nose Throat Disord. 2014;14(1):10.
4. Stevens G, Flaxman S, Brunskill E, Mascarenhas M, Mathers CD, Finucane M. Global and regional hearing impairment prevelances: An analysis of 42 studies in 29 countries. Eur J Public Health. 2011;23(1):146-52.
5. Postelmans JT, Grolman W, Tange RA, Stokroos RJ. Comparision of two approaches to the surgical management of cochlear implantations. Laryngoscope. 2009;119:1571-8.
6. Rama Lopez J, Cervera-Paz FJ, Manrique M. Cochlear implantation of patients with far advanced otosclerosis. Otol Neurotol. 2006;27:153-8.
7. Balkany TJ, Hodges A, Miyamoto RT, Gibbin K, Odabasi O. Cochlear implants in children. Otolaryngol Clin N Am. 2001;34:455-67.
8. Balkany TJ, Hodges AV, Eshraghi AA, Butts S, Bricker K, Lingvai J, et al. Cochlear implants in children- a review. Acta Otolaryngol. 2002;122:356-62.
9. Calhau CMDF, Lima Junior LRP, Reis AMCS, Capistrano AKB, Lima DVSP, Calhau ACDF, et al. Etiological profile of patients implanted with the Cochlear Implant program. Braz J Otorhinolaryngol. 2011;77(1):13-8.
10. Mehra S, Eavey RD, Keamy Jr DG. The epidemiology of hearing loss in the United States: newborns, children and adolescents. Otolaryngol Head Neck Surg. 2009;140:461-72.
11. Collins MM, Hawthorne MH, el Hmd K. Cochlear implantation in a district general hospital: problems and complication in the first five years. J Laryngol Otol. 1997;111:325-32.
12. Wiley S, Jahnke M, Meinzen-Derr J, Choo D. Perceived qualitative benefits of cochlear implants in children with multi-handicaps. Int J Pediatr Otorhinolaryngol. 2005;69(6):791-8.

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