DEAFNESS IN CHILDREN– AN ANALYSIS

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ABSTRACT

This study was conducted at the Government Deaf and Dumb School, Thanjavur to ascertain the possible etiological factors. The social outlook of the parents of these children was analysed. Boys were more often affected (60.2%). Consanguinity was observed in 65.4% parents; 23.1% had one or more affected sibling and 14.1% had affected relatives. Parents detected the hearing disability in their children between 3-6 months of age in about 79% cases. Syphilis and chickenpox were the common antenatal associated infections. Streptomycin, cholorquin and abortificients were used during early pregnancy. Eight were preterm and 9 were asphyxiated at birth. A total of 11.5% had purulent ear discharge, and 2 had ear injury. Parents were committed to help the children to be self dependent.

Key words: *Deafness, Genetic cause, Kernicterus, Asphyxia, Otitis media.*

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Deafness is not uncommon among children and it has been estimated by audiometric surveys that 9-15% of school children are partially or totally deaf(1). A study was conducted in the Government School for Deaf and Dumb in Thanjavur to assess: (*i*) the probable etiological factors, (*ii*) the associated congenital and/or acquired diseases, and (*iii*) the psychosocial problems.

Material and Methods

Of the 100 students attending Government Deaf and Dumb school, 78 were examined. Their parents were interviewed. The observations were recorded on a predesigned and pretested proforma, which included age, sex, number of siblings, relatives with similar complaints, parents' literacy, occupation, consanguinity, antenatal, and postnatal problems and the parent's outlook regarding the future of these children. A thorough clinical examination of all the children was conducted and anthropometric measurements were taken. Motor and mental development of the children were assessed clinically. Hearing tests included Rinne and Weber tests.

The parents were allowed to express their feelings without any inhibition to the study team which consisted of senior pediatricians, post-graduates, social workers and health visitors from the Department of Pediatrics, Thanjavur Medical College, Thanjavur.

Results

Of 78 children, 47 (60.3%) were boys and 31 (39.7%) girls. There were 3 children between the age of 5-7 years (3.8%), 7 between 7-9 years (9%), 12 between 9-11 years (15.4%), 19 between 11-13 years (24.4%), 15 between 13-15 years (19.2%),

and 22 above 15 years (28.2%). Nearly 61% of children belonged to poor socio-economic class. The educational status of parents were 26% literates, 53% functional literates and 21% illiterates. Twenty seven (34.6%) parents were non-consanguinous; II degree consanguinity was seen in 9 (11.51%), III degree in 33 (43.3%) and IV degree in 9 parents (11.5%). One or more siblings of 18 (23.1%) affected children were deaf and dumb. In 11 children (14.1%), one or more relatives had deafness. The nutrition status of these children was appropriate for age as assessed by weight and height.

Only 79% parents suspected hearing defects in their children between the age of 3-6 months and in 21% either school teacher, health personnel or play mate pointed out the defect. The third child (36%) or fourth (32%) child in the family was having impairment of hearing with delayed language development. One or both parents of 3 children had sensorineural deafness proved by sophisticated investigations.

TABLE I —*Possible Etiological Factors as per History*

Etiology	Number	Percentage
Antental problems in mothers		
Infections		
Syphilis	1	1.3
Chickenpox	1	1.3
Drugs		
Streptomycin	2	2.6
Choloroquin	3	3.9
Abortificients	7	9
Natal problems		
Preterm	8	10.3
Birth-asphyxia	9	11.5
Post natal problems in children		
Convulsions	3	3.9
Jaundice	2	2.6
Chickenpox	1	1.2
Ear discharge before 6 months of age	21	26.9
Injury ear	2	2.6

The possible etiological factors responsible for deafness obtained from parents and/or found out clinically are listed in *Table I.* Associated congenital and/or acquired diseases in the study population are shown in *Table II.* The type of deafness as assessed by hearing tests, was sensorineural in 49 children (62.8%), conductive in 11 (14.1%), and mixed in 18 (23.1%) children. The social outlook of the parents regarding their handicapped child is one of absolute depression though most of them were prepared to help the child to the maximum. The combination of their feelings are detailed in *Table III.*

Discussion

Pediatricians should make it a routine to assess the hearing ability of the child atleast by sound localisation whenever he/she gets a chance to see the child first. This is essential as early detection helps in better rehabilitation. If there is any doubt either to the parents or to the doctor, sophisticated test procedures are available to investigate even the newborns(2-4). If a genetic basis (autosomal recessive inheritance) can be associated, the prevalence of II and III consanguinity among parents of many children and presence of either sibling or relative with deafness can be explained(5,6). Anderson and Wedenberg have reported abnormal

TABLE II—*Associated Congenital and/or acquired Diseases*

Disease	Number	Percentage
Residual poliomilitis	2	2.6
Congenital heart disease	3	3.8
Primary complex in lung	36	46.1
Skin diseases		
Scabies	24	30.8
Phrynoderma	7	9
Melanoses	1	1.3
Traumatic fissure	1	1.3
Skeletal diseases		
Flat foot	7	9
Halux valgus	1	1.3
Lumber lordosis	2	2.6
Polydactyly	1	1.3
Syndactyly	1	1.3
Dental caries	22	28.2
Eye problems		
Non paralytic squint	2	2.6
Phlycten	2	2.6
Ear		
Congenital malformation	2	2.6
Vitamin deficiencies		
Vitamin A	16	20.5
Vitamin B	23	29.4
Learning disability	8	10.2

TABLE III—*Social Outlook of Parents*

Outlook of parents	Number	Percentage
Depressed and worried	78	100
Get the child educated and self supporting	72	92.2
What to do ?	69	88.4
Just accept and wait facing criticism by relatives	56	71.8
Ready to do anything for the child	37	47.4
Result of sin done in previous generation	22	28.2
Parents are prepared to take care of the child and no need for employment training	3	3.8

audiogram in 10% of parents(7). These studies raise doubts about feasibility of adopting an 'at risk' approach for early detection when at least 1/3 of the group have a genetic basis for deafness. However, first deaf child in the family will be missed if such an approach is utilised.

In the present study, none of the mothers gave a history suggestive of Rubella infection. During antenatal period one mother had syphilis (she had lost 7 children earlier) and one had chickenpox. Both can precipitate deafness in the child(1,8). Both streptomycin and chloroquin are listed as 'doubtful' causes of deafness(9). Although the causative nature cannot be ascertained by available literature presently, a positive correlation between abortificients and deafness can not be neglected.

Pre-term babies are prone for intraventricular hemorrhage and deafness as its sequalae. D'Souza *et al.* reported a low incidence (1 in 26) of sensorineural deafness in asphyxiated babies(10).

During post-natal period one child had jaundice and two had recurrent convulsions. The association between Stage IV bilirubin encephalopathy and partial or complete deafness has been well documented(11). Some causes of bilirubin encephalopathy may be asymptomatic in the neonatal period and may present with sequelae years later.

Hearing loss is the most prevalent complication and morbid outcome of otitis

media. Although it is usually a conductive deafness, a sensorineural component is also possible which is attributed to the effect of increased tension and stiffness of the round window membrane(12). Though not possible in these children who had ear injury, external compression, a slap or penetration by foreign object may cause traumatic perforation of tympanic membranes and result in deafness.

None of the children belong to an endemic area of iodine deficiency. Mental development was normal in all children.

Interrogation of parents revealed 'FAGS Syndrome' – Fear, Anxiety, Guilt and Sorrow'. All were depressed and worried, though they realised that nothing much could be done for their wards. All of them had one wish that the children should be educated for supporting themselves in future. The humiliation produced by neighbours and relatives to the children and parents is due to ignorance and lack of social outlook. Early detection, speech therapy and early use of hearing aids will help these children to withstand the social evils of the society.

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