

A STUDY ON CONGENITAL HEARING LOSS IN RELATION TO VENEREAL DISEASE

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Introduction

A review of literature shows that there are only a few studies reported on congenital hearing loss following -venereal diseases (Karmody *et al* 1966; Perlman and Leek 1952 and William 1945). Our present study was to throw some light on this particular aetiological factor precipitating hard of hearing. It was a collaborative work of the department of Audiology and Speech Pathology in the Institute of Otorhinolaryngology and the Institute of Venereology, Madras Medical College, Madras.

The population under study were the inmates of schools for the hard of hearing in Madras, namely; The Little Flower School for the Deaf and Blind, The C.S.I. School for the Deaf, C.S.I. Vocational Training Centre for the Adult Deaf and St. Louis School for the Deaf and Blind. The present study concerned 367 congenital hard of hearing cases.

Methodology

A team of specialists consisting of E.N.T. specialists, venereologists, audiologists and social workers visited the above schools twice a week. For all cases, detailed history was taken with the help of their class teachers as their parents were not available. All of them underwent general medical and otorhinolaryngological examination. A complete examination by the venereologist for any evidence of congenital syphilis was done on all cases and blood samples were collected separately for VDRL analysis. In suspected cases X-rays of the relevant parts were also taken. All the cases were subjected to undergo hearing evaluation. Pure tone audiometry was done by using Arphi clinical Audiometer Mark IV with ISO calibration. The thresholds were established in relatively calm and quiet rooms. The ambient noise was about 50 dB SPL as the rooms were free from noisy surroundings. Speech Audiometry could not be done as the subjects had inadequate speech and language development.

An Analysis of the V.D. cases which attended the Institute of Venereology during the year 1973 was done with relevance to the incidence of hearing loss.

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Results

Out of the 367 cases studied, 242 (65.9 per cent) were males. The age range varied from 5 to 29 years. Table I shows the age and sex distribution of the cases studied.

TABLE I. Age and Sex distribution of hard of hearing cases

<i>Age group</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
0.9	35 (9.5%)	27 (7.3%)	62 (16.8%)
10.19	194 (52.7%)	68 (18.5%)	262 (71.2%)
20.29	13 (3.7%)	30 (8.3%)	43 (12.0%)
	242 (65.9%)	125 (34.1%)	367 (100%)

112 cases (30.7 per cent) gave a family history of hearing loss in either their parents or siblings. There was no significant family history of hearing loss in the remaining 255 (69.3 per cent) cases. (Table II)

TABLE II. Family history of hard of hearing

<i>Age group</i>	<i>Present</i>	<i>Not known</i>
0.9	25 (6.8%)	37 (10.1%)
10.19	73 (20.1%)	189 (51.2%)
20.29	14 (3.8%)	29 (8.0%)
	112 (30.7%)	255 (69.3%)

Out of the 367 cases only from 6 persons could we obtain a definite history of consanguinous marriage among parents (Table III). In previous studies in South India on children of schools for the Deaf (Kapur, 1968; Rajenderkumar and Kameswaran, 1973) and on other children attending audiology clinics (Rajenderkumar and Kameswaran, 1973), history of consanguinity was reported in a very large percentage. It is possible that the history of consanguinity and even family history of hearing loss may be present in a higher percentage of cases in our study as well, since in the majority, history had to be obtained only from the teachers and not from the parents as the latter were not available.

TABLE III. Number with a history of consanguinity

<i>Age group</i>	<i>Present</i>	<i>Absent</i>	<i>Not known</i>
0.9	5. (1.4%)	5. (1.4%)	52 (14.0%)
10.19	0. (0%)	1. (0.3%)	261 (71.1%)
20.29	1. (0.3%)	1. (0.3%)	41 (11.2%)
	6. (1.7%)	7. (2.0%)	354 (96.3%)

General and venereological examinations did not reveal any evidence of congenital syphilis, primary, secondary or tertiary syphilis or any other venereal diseases.

Otological examinations of these cases revealed that 307 cases had normal ear findings with normal external auditory meatus and intact tympanic membranes. Fifty three cases were having impacted wax in one or both ears. Seven cases were suffering from chronic suppurative otitis media affecting either one or both ears. (Table IV).

TABLE IV. Otological Findings

<i>Age group</i>	<i>Normal</i>	<i>Wax</i>	<i>Csom</i>
0.9	50 (13.7%)	11 (3.0%)	1 (0.3%)
10.19	220 (59.9%)	36 (9.8%)	6 (1.6%)
20.29	37 (10.1%)	6 (1.6%)	0 (0%)
	307 (83.7%)	53 (14.4%)	7 (1.9%)

Pure tone audiometric thresholds have been established for all cases (Table V and IV). It was found that 82 per cent and 82.7 per cent of cases had hearing loss above 90 dB in the right and left ears respectively. 14.3 per cent of the cases showed hearing loss above 80 dB in both ears. In only a small percentage, the hearing thresholds were found to be below 80 dB HTL. None of the cases showed hearing thresholds below 60 dB HTL. In all cases except one, the bone conduction thresholds could not be established even at the maximum intensity levels of the audiometer. The only case in which both air conduction and bone conduction thresholds could be obtained, the air conduction thresholds were 65 dB and 75 dB in the right and left ears respectively and for the bone conduction the threshold was 40 dB in both ears at speech frequencies.

TABLE V. Right ear pure tone thresholds in db HTL and BHTL

<i>Age group</i>	<i>60.69</i>	<i>70.79</i>	<i>80.89</i>	<i>90.99</i>	<i>100 and above</i>
0.9	0% (0)	0.3% (1)	1.8% (7)	6.0% (22)	8.7% (32)
10.19	0.5% (2)	1.8% (7)	11.7% (42)	22.0% (81)	35.5% (130)
20.29	0.3% (1)	0.8% (3)	0.8% (3)	2.2% (8)	7.6% (28)
	0.8% (3)	2.9% (11)	14.3% (32)	30.2% (111)	51.8% (190)

TABLE VI. Left ear pure tone thresholds in db HTL and BHTL

<i>Age group</i>	<i>60.69</i>	<i>70.79</i>	<i>80.89</i>	<i>90.99</i>	<i>100 and above</i>
0.9	0% (0)	0% (0)	2.5% (9)	6.0% (22)	8.4% (31)
10.19	1.1% (4)	1.1% (4)	10.7% (39)	26.4% (97)	32.1% (118)
20.29	0.3% (1)	0.5% (2)	1.4% (4)	1.1% (4)	3.7% (32)
	1.4% (5)	1.6% (6)	14.3% (52)	33.5% (123)	49.2% (181)

The blood samples taken from all the cases were subjected to Venereal Disease Research Laboratory test in the Institute of Venereology, Madras Medical College. The results showed that out of the 367 blood samples, only one showed a weak reaction at Zero dilution level. All the other blood samples showed non-reactivity to VDRL test—Table VII.

TABLE VII. Analysis of blood VDRL

<i>Age group</i>	<i>Reactive</i>	<i>Non-reactive</i>
0.9	0. (0%)	62 (16.8%)
10.19	1. (0.3%)	261 (71.1%)
20.29	0. (0%)	43 (11.8%)
	1. (0.3%)	366 (99.7%)

An analysis of the cases attending the Institute of Venereology revealed that during the year 1973, 7284 V.D. cases attended, (Males 5,800; Females 1,484), of which 2,219 (Males 1,629; Females 590) were syphilitic cases. Among these there

were 47 congenital syphilitic cases (Males 8; Females 39) as shown in Table VIII. Rather oddly females accounted for the larger number of congenital syphilitic cases (about 5:1 ratio), even though in the total number of syphilitic cases males predominated in the ratio of about 3:1. The hearing level of all the congenital syphilitic cases were within normal limits as revealed by puretone audiometry.

TABLE VIII. Incidence of venereal disease for the year 1973 as given by Institute of Venereology

	<i>Male</i>	<i>Female</i>	<i>Total</i>
No. of Total Venereal Diseases Cases	5,800	1,484	7,284
Total No. of Syphilitic Cases	1,629	590	2,219
Congenital Syphilitic Cases	8	39	47

Dicussion

Moore *et al* (1963) stated that there were 1,24,000 cases of syphilis reported in United States in 1962 and also concluded that this figure represented, but 1/5 of the total number. The incidence of syphilis and hearing loss varied in different studies reported having been given as 25 percent and 33 per cent in separate studies by Alexander and Lund as reported by Dalsgaard-Neilson (1938). Karmody and Schuknecht (1966) reported in a study of 'Deafness in Congenital Syphilis', 38 per cent of the cases had hearing loss. The predominance of congenital syphilis in women had been discussed by Perlman and Leek (1952).

In our study the one who showed a weak reaction to Blood VDRL analysis, was a female aged 11 years. Her audiogram showed a flat hearing loss of 100 dB from 500 Hz to 3,000 Hz. and no response for the frequencies above 4,000 Hz. The threshold for 250 Hz was 90 dB in both ears. The audiological finding in this particular case was in correlation to Karmody *et al* (1966) as reported in a study of 143 cases of congenital syphilis. They found that about 38 per cent of their cases showed hearing loss of bilateral, progressive, sensorineural with loudness recruitment and often the hearing levels fluctuated considerably. Williams (1945) stated that in the average syphilitic, specific deafness was rare, and that if deafness was present it was probably due to other causes. On the other hand, in neuro and congenital syphilis the condition occurred fairly frequently. In a study at the Institute of Venereology, it was found that syphilitic keratosis was associated in nearly 10 per cent of cases of congenital syphilis (Sowmini, 1974).

Though a high incidence of congenital syphilis as an aetiological factor for congenital hearing loss was reported by above authors, the present study did not give any evidence of such a high incidence of congenital syphilis in our hard of hearing population.

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not give any evidence of such a high incidence of congenital syphilis in our hard of hearing population.

In conclusion, congenital syphilis as an aetiological factor causing hearing loss is rather insignificant when compared with other aetiological factors. In our study only in one out of 367 cases (0.3 per cent) of loss and none in 47 cases of congenital syphilis could we find congenital syphilis as a possible cause; even though we often emphasised too much in routine practice the importance of VDRL tests in congenital hard of hearing.

Summary

A total of 367 hard of hearing cases from various schools for the hard of hearing had been studied in relation to congenital venereal diseases. A complete general medical, otorhinolaryngological, and venereological examinations followed by blood VDRL analysis and audiological assessments had been done. Out of 367 cases, 112 cases reported to have definite family history of hearing loss, six gave history of consanguinity and seven cases had CSOM in either one or both ears.

A majority of the cases had hearing loss above 90 dB at speech frequencies in both ears and only in a small percentage the hearing threshold was above 60 dB. Of the 367 blood samples tested, only in one, a female child aged 11 years and whose audiogram showed a flat response of 10 dB in both ears, had a weak reaction at zero dilution for VDRL test. This, very low incidence of congenital syphilis was insignificant as a causative factor of hard of hearing among our children and was in contrast with other studies (Collin S. Karmody *et al*, 1966; Perlman and Leek, 1952; Alexander and Lund as reported in the study of Dalsgaard-Neilson, 1938, and Moore *et al*, 1963) which showed a high incidence of hearing loss due to congenital syphilis.

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