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Original Article

Ear, Nose and Throat Section

A Qualitative Study on Knowledge and Attitude towards Risk Factors, Early Identification and Intervention of Infant Hearing Loss among Puerperal Mothers- A Short Survey

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ABSTRACT

Introduction: Maternal active participation and their support are critical for the success of early hearing loss detection program. Erroneous maternal decisions may have large life long consequences on the infant's life. The mothers' knowledge and their attitudes towards infant hearing loss is the basis for their decisions.

Aim: The present study was done to determine the mothers' knowledge and their attitude towards risk factors of infant hearing loss, its early identification and intervention and also awareness of effect of consanguinity on hearing loss.

Materials and Methods: In this cross-sectional questionnaire survey study, a total of 100 mothers were interviewed using the questionnaire which consisted of three sections namely risk factors, early identification and early intervention of hearing loss. Chi-square test was used to establish relationship between consanguineous and non-consanguineous mother's responses to its effect on hearing loss. A p-value < 0.05 was considered as significant.

Results: Mothers' awareness was significantly high for visible causes (ear pain/discharge, head injury and slap to ear) of hearing loss. Positive attitude was seen for importance of screening programs and follow up testing. Moderate level of awareness was found on hazards of consanguinity and benefits of early identification. However, mothers were least aware of neonatal jaundice, NICU admission (>5 days), signs of late-onset and neural hearing loss, management of hearing loss, hearing aid fitting and therapy necessity, which might interfere in early detection and intervention of hearing loss.

Conclusion: It is crucial to educate mothers on few risk factors and management of hearing loss to reduce its consequences.

Keywords: Consanguineous marriage, Mothers' knowledge, Questionnaire

INTRODUCTION

Hearing loss is the one of the most prevalent disorder in the world. Hearing loss can be congenital or acquired later in life. The incidence of hearing disability reported to be 0.1% [1]. In India, the prevalence of moderate to severe hearing impairment is about 6.3%, which consists of about 63,05,67,000 individuals, who are hearing impaired. Among this, the prevalence of childhood onset hearing impairment is 2% [2]. As per the National Sample Survey Organisation report of 2002 [3], there are 3.062 million people with hearing impairment in India with more number in rural than in the urban sectors. Also, it is revealed that hearing impairment was second leading disability and top most cause of sensory deficit.

The consequences of hearing loss are huge if it occurs before the speech language development. However, infant hearing loss will have negative effects not only on speech, language, academic and socioemotional development but also in terms of costs [4-6]. Thus, the appropriate way to diminish these consequences is through implementation early hearing loss detection program. Along with professionals, parents are the major partners of these programs [7]. Inappropriate parental decisions towards early identification and intervention of hearing loss may have life long consequences on the infant's life [8]. The basis for these parental decisions is lack of knowledge and attitudes towards infant hearing loss.

Infant hearing loss is caused by multiple aetiological factors. Approximately 50% of the cases are thought to be due to pre-natal, peri-natal or post-natal factors and the remaining are due to genetic factors or unknown causes [9]. Primary prevention can be defined as the measures taken to prevent disorder before its occurrence. Secondary prevention is the early identification of the disorder, so that the consequence of the disorder is minimised. One must be aware of the causes in order to prevent the disorder. However, the literature suggests that public awareness and attitude towards disabilities in childhood are generally poor and often aggravated by superstitious customs and beliefs in developing countries [8,10-12].

The mothers in Nigeria had significant awareness of prevailing aetiological factors for childhood hearing loss and a very favourable attitude towards infant hearing screening and subsequent intervention [13]. On contrary, another study reported that there was a poor general awareness of infant hearing loss and the importance of early identification in a South African community [8]. An Indian study documented that the grandmothers had limited knowledge on medical complications like low birth weight, birth asphyxia and jaundice as a cause for hearing loss and were not aware of new-born hearing screening and early intervention programs [14].

Among the several risk factors of hearing loss, most studies have shown positive association between deafness and consanguineous marriage [15]. Consanguineous marriages are very common in Asia and Africa [16]. Study done by Sedehi M et al., revealed poor knowledge and the attitude of young couple in North of Iran

regarding hazards of consanguineous marriages [17]. Thus, it is important to explore maternal awareness on consanguinity.

India is a developing subcontinent with world's second highest population and considerably high prevalence of hearing loss. For the success of early identification and rehabilitation programs initiated by different public (like, National Program for Prevention and Control of Deafness) and private organizations, the knowledge about the awareness in parents and their attitude towards hearing loss is crucial. However, there is dearth of studies which explores mothers' insights regarding the risk factors of hearing loss and its early identification and intervention in Indian context. Hence, further study is needed to support these programs. The aim of this study was;

- To explore the mothers' knowledge and their attitude towards risk factors of infant hearing loss, early identification and intervention.
- To determine difference in responses obtained by the mothers with consanguineous and nonconsanguineous marriage, if any.

MATERIALS AND METHODS

Participants: The mothers were recruited from maternity hospital, Mandya, Karnataka, India, for the study. Questionnaire survey was conducted for duration of a month (June 2016), where a total of 130 deliveries were reported. All mothers were selected from post-natal wards irrespective of the education level, age, order of the child and region. Mothers who were not cooperative (n=8) and who did not give consent (n=4) were not part of the study. Also, few mothers (n=5) who were non-native speakers and who partially filled questionnaire (n=13) were excluded. Hence, a total of hundred (n=100) mothers participated in the study. Age range of mothers selected for the study was from 19 to 36 years (mean age: 21.65 years). It was ensured that the answers were not influenced by any other family members/participants.

An adapted version of the questionnaire used by Olusanya BO et al., was utilized for the study [Appendix-1] [11]. The original questionnaire comprised of 16 questions which had questions on knowledge of risk factors, identification and intervention, superstitious cultural beliefs and attitudes. However, the questionnaire used in the current study consisted of three sections. First section comprised of twelve questions based on prenatal, natal and post natal risks of infant hearing. Second part of the questionnaire was designed to determine participants' knowledge/attitude on early detection of hearing loss using six questions. The final section included twelve questions to measure participants' attitude on early intervention of hearing loss.

Procedure: The study was initiated after obtaining approval from the Institutional Ethics Committee, Mandya Institute of Medical Sciences, Mandya, Karnataka, India. Before starting the study, written consent was taken from the mothers, who participated in the study. Demographic details such as age, place, family history, consanguinity and education were also collected. Data was collected through individual semi structured interview with mothers. The questionnaire was administered by two interviewers who communicated effectively with all participants; in case of difficulty, the questions were rephrased. Personal interview was conducted which had the scope to cross check their knowledge. The responses expected were either yes, no or unsure, where 'yes' represented presence of awareness, 'no' represented absence of awareness and 'unsure' represented lack of information regarding the target questions. Few questions from section two and three were accompanied with probe-in questions to eliminate bias of leading questions. The average time taken for single interview was around 15 minutes, which included collecting the demographic details and administering the questionnaire.

STATISTICAL ANALYSIS

The results obtained in the study were analysed statistically using the Statistical Package for Social Sciences (SPSS) software version 20.0. Chi-Square test was used to test statistically significant relationship between consanguineous and non-consanguineous mother's responses to its effect on hearing loss. A p-value of less than 0.05 was considered as significant.

RESULTS

The responses for each question from the mothers are shown in [Table/Fig-1].

Out of the 12 risk factors, the mothers knowledge was appreciably high for head injury/slap to the ear (95 mothers) followed by ear pain/discharge (91 mothers). Importantly, 72 mothers believe that family history is a major risk factor for hearing loss, whereas eight of them were not sure. The mothers' insight was relatively poor for natal causes such as delayed birth cry, neonatal jaundice and post natal cause like high fever, frequent hospitalization which can be linked to cytomegalo virus infection and/or meningitis [Table/Fig-1].

The maternal awareness on presence of congenital hearing loss (n=60) and attitude towards importance of screening programs (n=66) and follow up testing (n=68) were relatively better than

	Questions	Yes (1)	No (2)	Unsure(3)
Section A: Risk factors of hearing loss				
1	High fever and infections during pregnancy	44	34	22
2	Ototoxic medications during pregnancy	54	27	19
3	Early and elderly pregnancy	45	32	23
4	Consanguineous marriage on hearing loss	56	33	11
5	Family history	72	20	8
6	Delayed birth cry	29	35	36
7	Neonatal Jaundice	20	37	43
8	Prematurity and low birth weight (>1.75 kg), NICU > 5 days	39	25	36
9	Measles and mumps	42	44	14
10	High fever and hospitalization	20	61	19
11	Head injury/slap on ear	95	2	3
12	Ear infections (Ear discharge and ear pain)	91	8	1
Section B: Early identification				
13	Congenital hearing loss	60	22	18
14	Hearing loss detection at birth	34	48	18
15	Importance of screening	66	27	7
16	Follow-up testing	68	29	3
17	Signs of late-onset hearing loss	21	33	46
18	Signs of auditory dyssynchrony	23	30	47
Section C: Early intervention				
19	Treatment for congenital hearing loss	22	21	57
20	Hearing aid at birth	18	62	20
21	Therapy necessity	39	43	18
22	Child with hearing loss cannot speak	41	43	16
23	Speech better than sign language	61	36	3
24	If child with hearing loss identified and rehabilitated early (<1 yr), Normal speech and language development	62	33	5
25	Academically successful	52	38	10
26	Good socialization skills	71	23	6
27	Regular school more suited than special school	51	40	9
28	First word acquisition by one year	27	69	4
29	Government facility	28	2	70
30	House medicine	39	35	26

[Table/Fig-1]: Distribution of responses obtained by mothers (n=100).

Variables	Q4:Consanguinity can cause hearing loss		
	Yes	No	Unsure
Consanguineous mothers (n=21)	10	6	5
Non-consanguineous mothers (n=79)	46	27	6
Total	56	33	11
Chi square value	12.455	p-value*(0.002)	df**(2)

[Table/Fig-2]: Distribution of responses obtained from consanguineous and non-consanguineous mothers.
*p-value of < 0.05 was taken for statistical significance
**df is degree of freedom

the other factors which assist in early identification. However, the mothers were least aware of signs such as sudden withdrawal, misarticulations, inconsistent responses to name call and poor academic performance which may indicate presence of late-onset hearing loss (n=21) or auditory dys synchrony (n=23).

It is unfortunate that, 57 mothers did not know the treatment options for congenital hearing loss. Habilitating the infant with hearing loss by fitting the appropriate hearing aid within six months of age will improve child's speech and language acquisition [4]. Only 18 mothers were in agreement with the statement. Also, rehabilitation of infant with hearing loss is successful not only with appropriate hearing aid fitting but also by receiving adequate speech-language therapy [5,6]. Only 39 mothers of 100 were aware of therapy necessity. Most of the mothers agree that if the child is identified and habilitated early (<1 year), then the socialization skills (n=71), followed by speech and language development (n=62) and academic success (n=52) will be better compared to late identification. The important speech milestone of typically developing children is utterance of first word by one year of age; only 27 mothers had the knowledge. The government facilities given to individuals with hearing loss were not known to 70 mothers. Around 39 mothers still believe the house medicines will have positive results for ear pain and ear discharge.

Responses of consanguineous and non-consanguineous mothers regarding the effect of consanguinity on hearing loss: Amongst 100 mothers, the demographic data revealed 21 mothers were married in relation; only 10 of them recognized that consanguinity can be one of the risks for hearing loss. Among those who were not into consanguineous marriage (79 mothers), 46 of the mothers were aware of ill effects of consanguinity. To compare and evaluate the differences in distribution of responses among consanguineous and non-consanguineous mothers, chi-square test was applied; it was found that the difference was highly significant with p-value <0.002. Remaining 44 mothers either had wrong or no knowledge regarding the effect of consanguinity on hearing loss.

DISCUSSION

It is evident from the literature that, unidentified congenital hearing loss can adversely affect speech-language development, academic and socio-emotional development [4]. Mothers play a key role in monitoring child's speech, language and motor development. Consequently, maternal knowledge regarding hearing loss is critical for the success of early identification and intervention program. The current study makes an important contribution about the mothers' insight and attitude towards infant hearing loss.

The results showed high awareness on ear infections and slap to ear/ head injury as causes of hearing loss [Table/Fig-1]. This is in agreement with the study conducted by Swanepoel D and Almec N [8], which reported high rate of identifying ear discharge as a risk factor from mothers from Nigeria (73%) and South Africa (79%) respectively due to visible nature of this condition [13]. Additionally, they had poor knowledge on neonatal jaundice and delayed birth cry as the risk factors for hearing loss in present study. It is evident from the literature that infants with neonatal jaundice and/or admitted in Neonatal Intensive Care Unit (NICU) for >five to seven days are at greater risk of developing neural hearing loss [18,19]. Thus, lack of knowledge of mothers in this area may delay the detection of hearing loss and further intervention [4]. Furthermore, mothers ignored the signs and symptoms of late-onset and neural hearing loss [Table/Fig-1]. This lack of knowledge is reported as families may observe the toddler responding to loud sounds in the environment [20]. The results are in consonance with study which reported, factors that contribute to failure to identify children with hearing loss include lack of parental support/awareness of signs of hearing loss in very young children and "wait-and-see" attitude exhibited by physicians [21].

The maternal knowledge regarding the consequences of consanguinity was determined, which showed better awareness (n=56) amongst mothers. However, it can be observed that consanguineous mothers have superior awareness than non-consanguineous mothers [Table/Fig-2]. On contrary, young couples in North of Iran had poor knowledge and attitude towards hazardous effect of consanguinity [17]. Another study showed 7.6% of women in Shindoli village (Belagum district of India) were aware that still births, neonatal mortality, obstetrical complications and congenital malformations could result in consanguineous marriage [22]. In summary, literature reports poor to moderate level of awareness on consanguinity and suggests the importance of sensitizing the public against ill effects of consanguineous marriages.

On the other hand, attitude of mothers towards importance of screening, follow up testing and benefits of early intervention of infant hearing loss is positive [Table/Fig-1]. This is in accordance with the fact that children enrolled in early intervention within the first year of life have been shown to have language development within the normal range of development at five years of age [21]. On contrast, lack of understanding about the management of hearing loss, age appropriate hearing aid fitting, therapy necessity and house medicines will cause delay in intervention of hearing loss. The literature suggests that higher maternal awareness were significantly associated with earlier confirmation of hearing loss and fitting of amplification device, in a group of children with hearing loss [20]. In countries like India, the major hindrances for establishing an effective screening program are the costs involved, the non-availability of equipment and human resources. Thus, educating mothers will support early detection and management of hearing loss.

LIMITATION

The present study was conducted for a short period; the sample size was not sufficiently large. The appropriate responses on knowledge of the mothers would be obtained if they were from different geographical area (rural/urban), educational background.

CONCLUSION

The current study reveals moderate to high levels of awareness on visible causes (ear pain and ear discharge), established causes like family history, consanguinity and benefits of early identification. However, mothers are least aware of other risk factors and management of hearing loss. To reduce the consequences of hearing loss, implementation of sensitization programs for mothers regarding the risk factors of hearing loss, benefits of early identification and intervention is required.

Appendix -I

Name: **Age/Sex:**

Place: **Consanguinity:**

Family history of Speech and Hearing Disorders:

Sl No.	Questions	No	Yes	Un sure
Section A: Risk factors of Hearing Loss				
1	Does high fever and infection to the mother during pregnancy cause hearing loss in the child?			
2	Can intake of non-prescribed medicines (ototoxic drugs) during pregnancy cause hearing loss in a child?			
3	Does early and elderly pregnancy cause hearing loss in a child?			
4	Is there any relation between marriage in relation and hearing loss?			
5	Does family history of congenital hearing loss can cause hearing loss in an infant?			
6	Can delay in birth cry lead to hearing loss?			
7	Is there any relation between neonatal jaundice and hearing loss?			
8	Do you think premature delivery, low birth weight (<1.75 kg) and > 5 days NICU admission can cause hearing loss?			
9	Does measles and/mumps affect hearing?			
10	Do the signs such as high fever and prolonged hospitalization show the baby may get hearing loss at a later stage?			
11	Does head injury and/or slap to the ear cause hearing loss?			
12	Does ear pain, ear discharge affect hearing ability of the child?			
Section B: Early Identification				
13	Can babies be born with hearing loss?			
	If no, then at what age hearing loss is usually seen?.....			
14	Can hearing loss be identified at birth?			
	If no, then at what age hearing loss can be identified?.....			
15	Do you think hearing screening at birth is important?			
	If no, why do you think so? ……..			
16	Do you think once your child is tested, a follow-up is required to track his status?			
	If no, why don't you? ……			
17	When an active child suddenly becomes dull, withdrawn, mispronounces words gives inconsistent responses to speech and shows poor academic performance, do you suspect hearing loss in the child?			
	If no, then what could the problem?.....			
18	When a child gives inconsistent responses to name call, has difficulty understanding speech then, do you think hearing testing is necessary?			
	If no, then what could the problem?.....			
Section C: Early Intervention				
19	Is there any treatment for hearing loss present since birth?			
	If yes, then what are the treatment options?.....			
20	Would you let your baby wear hearing aid at the earliest?			
	If yes, then at what age?.....			
21	Do you think auditory verbal therapy is necessary after the child wears hearing aid?			
	If no, why don't you? ……			
22	Do you think child with congenital hearing loss cannot speak like normal child?			
	If no, how?.....			
23	Do you think training child to speak is better than teaching sign language?			
24	If the child is identified and rehabilitated early, can the child learn optimum speech and language?			
25	If the child is identified and rehabilitated early, can the child attend normal school and does the child have similar educational opportunities as hearing peers?			
26	If the child is identified and rehabilitated early, can the child mingle with other hearing peers?			
27	Do you think regular school is more suited than special school for child with hearing loss?			
28	Does the child acquire first word by 1 to 1½ years of age?			
	If no, till what age do you for the child to speak?.....			
29	Are you aware of facilities provided by the government?			
	If yes, what are the facilities?.....			
30	Do you think house medicines will provide complete cure for ear pain and discharge?			
	If yes, what are the commonly employed house medicines? …….			

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