



Assessing Knowledge and Awareness About the Effect of Consanguinity on Hearing Loss in Children - A Community Based Study

Vinita Metgudmath¹, Sachi Hajare^{2*}, Vaishnavi Mahishale³ and Priti Hajare⁴

¹Associate Professor, Department of ORL&HNS, J N Medical College, Kaher, Belagavi, India

²Undergraduate Student III/I MBBS, J N Medical College, Kaher, Belagavi, India

³Undergraduate Student III/II MBBS, J N Medical College, Kaher, Belagavi, India

⁴Professor, Department of ORL&HNS, J N Medical College, Kaher, Belagavi, India

***Corresponding Author:** Sachi Hajare, Undergraduate Student III/I MBBS, J N Medical College, Kaher, Belagavi, India.

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Sachi Hajare., et al.

Abstract

Background: Consanguineous marriage, defined as a union between blood relatives, is culturally accepted in many regions but is associated with increased genetic risks, including childhood hearing loss. Public awareness about these consequences and the importance of early detection and intervention is crucial for effective prevention and management.

Objective: To assess the awareness, beliefs, and attitudes of individuals regarding consanguineous marriage and its potential association with childhood hearing loss, along with understanding of risk factors, early detection, and treatment options.

Methodology: A questionnaire comprising 19 questions was administered to evaluate participants' knowledge on consanguineous marriage, hereditary and non-hereditary causes of hearing loss, and the significance of early intervention. Responses were categorized into three levels of awareness: low, moderate, and high.

Results: Most participants (82.5%) were aware of consanguineous marriage, and 90% understood its consequences, though 37.5% still supported such unions. Awareness of risk factors for childhood hearing loss varied: 65% knew about risks from NICU stays over five days, 40% from neonatal jaundice, 35% from ototoxic antibiotics, 52.5% from maternal medications, and 80% from maternal infections during pregnancy. Additionally, 62.5% recognized head or ear injuries as risk factors. Awareness was high regarding early detection (85%), treatment options (90%), and the importance of early intervention (90%).

Conclusion: The study reveals a significant level of awareness about consanguineous marriage and childhood hearing loss. However, gaps remain in translating knowledge into practice, especially concerning support for consanguineous unions and understanding of certain medical risk factors. These findings highlight the need for targeted health education programs focusing on genetic counseling, risk prevention, and early intervention strategies to reduce the incidence of hearing loss in children.

Keywords: Consanguineous Marriage; Childhood Hearing Loss; Early Detection; Genetic Risk Factors; Neonatal Risk Factors; Maternal Infections; Public Awareness Preventive Health Education

Introduction

Consanguineous marriages are more prevalent in India than in many other countries due to cultural, religious, and social practices. According to the latest National Family Health Survey-5 (NFHS-5), 11% of marriages in India are consanguineous. Consanguinity of parents is one of the most important risk factors that can have

serious impact on a child's life in the form of congenital malformations and genetic diseases [1]. Awareness regarding consanguineous marriage and other risk factors of infantile hearing loss is essential for prevention, early detection and timely intervention which can save children from lifelong consequences of hearing disability. Congenital hearing loss (CHL) is prevalent chronic condi-

tions in children, affecting 4-6 per 1000 children in India can lead to a major delay in speech, language, and psychosocial development of the child. Hereditary hearing impairment accounts for 50% of sensorineural hearing loss (SNHL) [2]. The risk of having more than one child with hearing impairment in a consanguineous marriage is 3.5 times higher than a non-consanguineous marriage [2]. Consanguinity is common, with an overall prevalence of 7.4% in India and highest in South India [3,4], with 23.8%. As per the national family health survey report there has been only a modest reduction in the prevalence of consanguineous marriages over the years. This supports the fact that such marriages form an integral part of cultural and social life in India. Therefore attempts to discourage it may be inappropriate and undesirable for many. Studies have found that 86.2% parents are unaware of the adverse effects of consanguineous marriage on hearing, and that awareness is important in these cases [5].

Need of the study

There is a clear gap in community-based research assessing public awareness of the genetic implications of consanguinity, particularly in specific geographic regions like Belgaum district, Karnataka. A community-based approach is essential to:

- Accurately estimate the prevalence of consanguineous marriages.
- Understand the sociocultural factors influencing this practice.
- Determine its association with hearing loss and other congenital complications in children.
- Design effective, targeted interventions and educational strategies.

In this part of the state many children with deaf mutism approached out tertiary care centre for solutions. As we probed in, we found history of consanguinity is seen in nearly 60% of our cases with no awareness about the consequences of that in relation to hearing loss. This community based study was hence done to find out the awareness of people regarding the ill effects of con-

sanguinity, to determine the prevalence (magnitude) and type of consanguineous marriages, and to study its association with various sociodemographic variables and complications among children in Belgaum district of Karnataka state in South India [1-4]. As a tertiary care centre empanelled for Government free Cochlear Implant surgery scheme for deafness in children, a pilot study was planned with the following objective.

Objectives

To evaluate and correlate knowledge and awareness about the effect of consanguineous marriage on hearing loss in children.

Methodology

- **Study Design:** Community based cross sectional pilot study
- **Study Area:** Belgaum district, Karnataka, South India
- **Study Population:** Parents of children operated for Cochlear implant surgery at a tertiary care center.
- **Sample Size:** Universal sample size

Data collection tools

A pre-tested, structured questionnaire will be used as the primary data collection tool for this community-based cross sectional study. The questionnaire has been developed based on literature review, expert input from ENT specialists and audiologists, and guidelines from the National Programme for Prevention and Control of Deafness (NPPCD). The questionnaire is designed to assess knowledge and awareness amongst parents regarding:

- The impact of consanguineous marriages (marriage between blood relatives) on hearing loss
- Awareness of medical and environmental risk factors that can cause infantile hearing loss

This will help identify gaps in public knowledge, misconceptions, and the need for targeted health education or intervention strategies.

Question format

SL NO.	Questions	Yes 1	Not Sure 2	Don't Know 3
1.	Are you aware about the consanguineous marriage?			
2.	Do you know the various consequences of the consanguineous marriage			
3.	Do you support marriage between blood relatives?			
4.	Is there a risk of hearing loss in a child born to parents who are blood relatives?			
5.	Is there a risk of hearing loss in a child if there is a family history of congenital hearing loss?			
6.	Do you know different types of Consanguineous marriage ?			
7.	Can hearing loss be detected soon after birth?			
8.	Will you get your child immediately tested if there is any decreased/no responsiveness to sound or there is delay in speech/language?			
9.	Is there any treatment for infantile hearing loss?			
10.	Are you aware that early identification of hearing loss in child, early treatment and rehabilitation can enable a child to learn optimum speech and language and attend normal school			
11.	Do you know that hearing loss can be managed by hearing aids and surgery?			
12.	Is there a risk of hearing loss in a child hospitalized in NICU (neonatal intensive care unit) for more than 5 days?			
14.	Is there a risk of hearing loss if a newborn suffers from jaundice?			
15.	Is there a risk of hearing loss in babies receiving antibiotics (gentamicin, amikacin etc.)?			
16.	Is there a risk of hearing loss in child if the mother takes medicines during pregnancy which may damage ears?			
17.	Is there a risk of hearing loss in child if the mother has fever/infections during pregnancy? (Infections like herpes, rubella, syphilis, toxoplasmosis and cytomegalovirus, zika-virus)?			
18.	Is there a risk of hearing loss in child with history of head/ear injury?			
19.	Is there a risk of hearing loss in infants having fever due to meningitis/encephalitis/measles?			
20.	Is there a risk of hearing loss if a child has ear infection/discharge?			

Table 1**Survey Result**

This survey evaluates the awareness, beliefs, and attitudes of individuals regarding consanguineous marriage (marriage between blood relatives) and its association with childhood hearing loss. The data provides insights into how informed people are about various risk factors, early detection, and treatment options related to hearing loss in children.

Following graph shows the analysis of responses given by the parents for 1 to 19 questions as Yes(1), Not Sure(2), Don't know(3).

Result - Awareness of consanguineous marriage

- A high percentage (82.5%) of respondents is aware of consanguineous marriage.
- 90% are knowledgeable about its various consequences.
- However, 37.5% still support marriage between blood relatives, indicating a gap between knowledge and attitude.

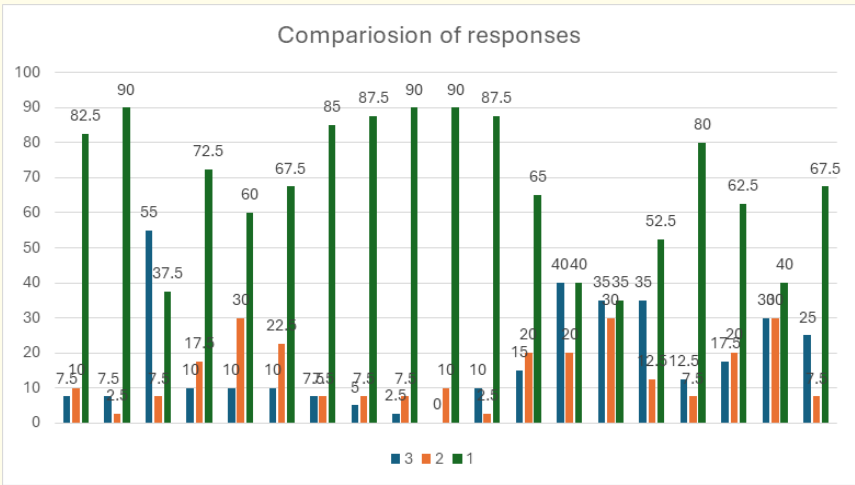


Figure 1

Awareness of hearing loss risks related to consanguinity

- 72.5% agree there is a risk of hearing loss in children born to consanguineous couples.
- 60% acknowledge the risk when there is a family history of congenital hearing loss.
- A majority (67.5%) are aware of different types of consanguineous marriage.

Understanding early detection and treatment

- 85% understand that hearing loss can be detected soon after birth.
- 87.5% would seek immediate testing if their child showed signs of hearing loss.
- 90% believe there are treatment options for infantile hearing loss.
- A large majority (90%) understand the importance of early identification and intervention for better outcomes.

Knowledge of Causes and Risk Factors

- 87.5% are aware that hearing loss can be managed with hearing aids and surgery.
- There is mixed awareness about risk factors:
- NICU stay >5 days: 65% aware
- Newborn jaundice: Evenly split at 40% aware, 40% unaware
- Use of antibiotics like gentamicin: Mixed awareness (35% aware, 30% unaware, 35% neutral)
- Maternal medication during pregnancy: 52.5% aware

- Maternal infections during pregnancy: 80% aware
- Head/ear injury in child: 62.5% aware
- Infections like meningitis/measles: Equally split at 40%
- Ear infection/discharge: 67.5% aware.

Discussion

Our findings align with evidence from South India that underscores a strong link between consanguinity and congenital hearing loss. In a case–control study in Raichur, Karnataka, 48% of children with congenital hearing impairment had parents in consanguineous marriages [7], compared to 28% in the control group—highlighting a statistically significant association.

Moreover, a pilot genetic study in Shivamogga, Karnataka, focused on GJB2 mutations (like W24X), found that 25% of screened children had a hearing-loss-related mutation, though the study did not conclusively link the mutations to consanguinity [8].

In terms of public awareness and behavior, a pre-post health education study in Puducherry revealed that 65% of participants initially did not recognize consanguinity as a risk factor for congenital hearing loss, highlighting the urgent need for community-level interventions [9].

Similarly, epidemiological work in North Karnataka emphasizes the widespread prevalence of consanguineous marriages in the region, compounded by socioeconomic challenges such as poverty

and limited awareness, which contribute to higher rates of inherited hearing impairment [10]. These findings reinforce the urgent need for culturally sensitive genetic counseling, enhanced health education, and early screening, especially in high-risk regions across South India [11].

Conclusion

While general awareness about consanguineous marriage and its impact on childhood hearing loss is fairly high, there remains a notable gap between knowledge and behaviour—evident from the significant percentage supporting marriage among blood relatives despite knowing its risks. Furthermore, public understanding of specific risk factors such as jaundice, NICU stay, and certain medications remains inconsistent. This highlights the need for targeted educational programs to bridge these gaps and promote early diagnosis, intervention, and preventive care for hearing-related issues in children.

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