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Risk factors of communication disorders in children visiting a tertiary child care center in Dharwad: A questionnaire-based study

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Abstract

Purpose: The study aimed to investigate the presence of high-risk factors of communication disorders among children visiting a tertiary child care center in Dharwad.

Methods: Parents of 976 children between the ages of birth to 3 years were interviewed using a questionnaire on high risk register for communication disorders for medical professionals. Further, telephonic follow up/ direct evaluation was carried out in those children who had any one of the risk factors leading to a communication disorder.

Results: Among the 40 children between birth- to 1 month, 20 (50%) had at least one or more high-risk factors, and the remaining 20 (50%) did not show a history of any risk factors for communication disorders. In the group of 1 month to 3 years, out of 936 data analyzed, 291(31%) children had at least one or more high-risk factors, and the remaining 645 (69%) did not show the history of any risk factors of communication disorders. In both the group, the chi-square test revealed no association between the presence of risk factors with variables like geographical area, gender and parental education. Follow up data after one year found that 15 (1.53%) out of 976 children showed communication disorders, and all these children exhibited more than one high-risk factor.

Conclusion: It was found that children visiting a tertiary child care center had various risk factors leading to a communication disorder. Hence, the study highlights the need for a high-risk register usage in the early identification of communication disorders.

Keywords: High risk register, joint committee on infants hearing, hearing impairment, communication disorder

Introduction

A high-risk register (HRR) is a questionnaire-based technique with which one can categorize a small group of children whose history or physical state identifies them as possessing a high probability of having the handicap being searched for ^[1]. High-risk factors during the pre-, peri-, and post-natal phases of birth can lead to communication disorders, including hearing loss, cerebral palsy, intellectual disability etc. In the early 1990s, several studies have established that the use of high-risk register as a part of infant hearing screening programs helped in identifying around 50% of infants with hearing loss ^[2-4]. There are a few studies that investigated the relationship between hearing loss and high-risk factors. Among that, few reported 37.5% newborns with risk factors such as, neonatal intensive care unit (NICU) with assisted ventilation or hyperbilirubinemia, recurrent otitis media with effusion, craniofacial malformation and family history as indicated in the Joint Committee on Infants Hearing (JCIH) were later diagnosed as having hearing loss ^[5-6]. One of the studies reported that hyperbilirubinemia is a risk indicator in almost 83.3% of term newborns. Higher serum bilirubin levels associated with higher chances of affecting the hearing ^[7]. Other factors like low birth weight ^[8], premature delivery, birth asphyxia were also found to be associated with hearing loss ^[9-10].

One of the Indian study indicated that high-risk factors such as the history of excessive vomiting, abortions and neonatal jaundice hinted the risk for communication disorders in children ^[11]. They also reported no or minimal association found for other high-risk factors like Viral/ bacterial infections, low birth weight, delayed birth cry, and NICU for more than five days. In a retrospective study, using a high-risk register, 75.5 percent of the studied population with hearing impairment was identified early, whereas 24.5 percent of populations did not show any risk factors. Among those with risk factors, the most frequently occurring were parental concern (100%), consanguinity (35.5%), family history of

sensorineural hearing loss (19%), delayed birth cry (16.5%), prematurity (12.5%), hyperbilirubinemia (6.5%) and maternal illness (9.5%)^[12].

Need of the study

A high-risk register is an important tool for the early identification of communication disorders. It is evident from the above literature that, based on HRR, there is a possibility to identify communication disorders at an early stage. However, many parents are unaware of possible risk factors that may be leading to a communication disorder. Hence, it is important to identify the presence of risk factors so that parents can be counselled appropriately. This will also help in the administration of speech, language and audiological evaluations if necessary. Further, a few studies were investigated the presence of high-risk factors leading to communication disorders in the general population. Hence, the present study was aimed to identify the risk factors of communication disorders in children between the ages of birth to 3 years.

Methods

Parents of the children who visited a tertiary child care center located in Dharwad participated in the study. A total of 936 parents were interviewed using a questionnaire developed at the Department of Prevention of Communication Disorder, All India Institute of Speech and Hearing (AIISH), Mysore for medical professionals. The questionnaire contains 29 questions related to the risk factors of communication disorders. A qualified Speech-language pathologist and Audiologist administered the questionnaire and the responses were tabulated. Further, details such as gender of the child, geographical area, and parental education were also noted. A telephonic follow-up/direct evaluation was conducted after one year from the

initial survey date. Statistical analysis was performed to study the distribution of high-risk factors using the SPSS-20 statistical software.

Results

The present study intended to examine the presence of HRR factors among children aged between birth to 3 years who visited tertiary child care center at Dharwad, Karnataka. The study also compared the presence of risk factors with respect to various geographical areas and parental educational status. A total of 976 parents were interviewed. There were 40 (4%) children between the age range of birth to 1 month, and the remaining 936 (96%) children were in the age range of 1 month to 3 years. Descriptive statistical analysis was carried out for both groups.

HRR analysis for birth to 1 month group

The analysis of demographic data obtained from parents of 40 children aged between birth to 1 month showed that 18 (45%) and 22 (55%) parents were from rural and urban areas, respectively. Gender wise analysis revealed 22 (55%) were male children, and 18 (45%) was female children. Out of 40 children, 20 (50%) had at least one or more high-risk factors, and the remaining 20 (50%) did not show a history of any risk factor for communication disorders. Frequency analysis of HRR factors revealed 10 (25%) children were born to consanguineous parents. Five (12.5%) children showed a history of prematurity, low birth weight, birth asphyxia, and delayed birth cry during their peri-, and post-natal period. HRR factors such as low APGAR score, craniofacial anomalies, trauma during pregnancy, ototoxic medication and hypertension during pregnancy had a frequency of occurrence less than 1%. Graphical representation of different high-risk factors with a frequency of greater than 1% is presented in Figure 1.

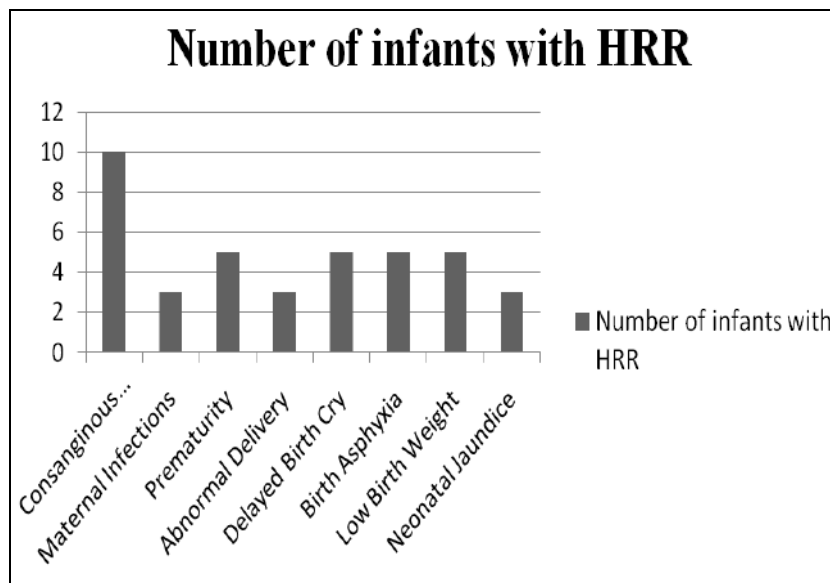


Fig 1: High-risk factors seen among children between birth to 1 month

A chi-square test of independence was performed to examine the relationship between the presence of HRR factors among the geographical area, gender and parental education. The results showed that there was no significant association between HRR and gender ($p > 0.05$), geographical area ($p > 0.05$) and parental education ($p > 0.05$).

HRR analysis for 1 month to 3 years group

Analysis of the demographic data obtained from parents of 936 children aged between 1 month to 3 years suggested that 496 (53%) and 439 (46.9%) parents were from urban and rural areas, respectively. Gender wise analysis revealed that there were 543 (58%) male children, and 393 (42%) female children.

Out of 936 data that were analyzed, 291(31%) children had at least one or more high-risk factors and remaining 645 (69%) did not show history of any risk factors for communication disorders. Frequency analysis of HRR factors revealed that 106 (11.3%) children exhibited history of infections like meningitis, encephalitis, mumps or measles which are known to be risk factors leading to sensorineural hearing impairment; 79 (8.4%) children showed history of hyperbilirubinemia during their post-natal

period; and 50 (5.3%) children presented with family history of communication disorder. HRR factors such as presence of craniofacial anomalies, language comprehension issues, inadequate stimulation at home, behavioral issues and motor coordination issues had frequency of occurrence less than 1%. Frequency table of different high-risk factors with frequency of occurrence greater than 1% are presented Figure 2.

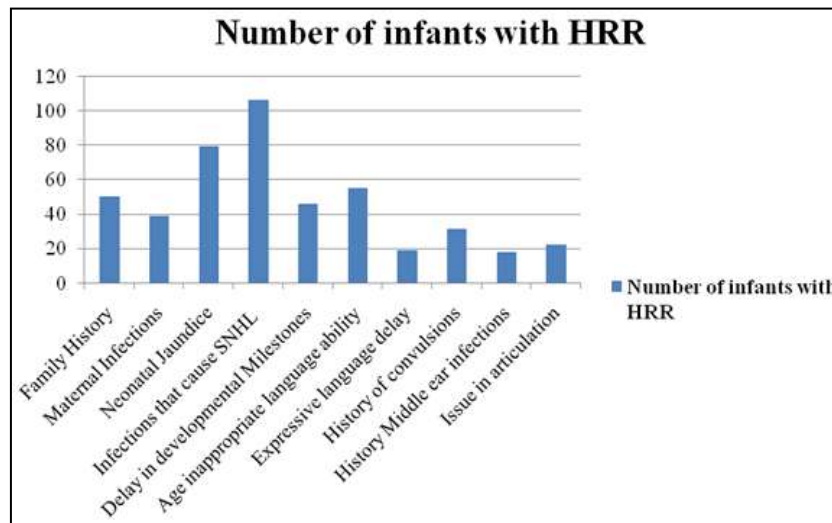


Fig 2: High risk factors seen among children between 1 month to 3 years

A chi-square test of independence was performed to examine the relation between presence of HRR factors among the geographical area, gender and parental education. The results showed that there was no significant association between gender ($p > 0.05$), geographical area ($p > 0.05$) and parental education ($p > 0.05$) with the presence of HRR factors.

During the follow up after 1 year, it was found that 15

(1.53%) out of 976 children showed communication disorders. Among those 15, 11(73%) had a delay in speech-language development, 3 (20%) had hearing impairment, and 1(7%) had cognitive delay. 5 children didn't show any risk factors for communication disorder. HRR factors associated with each communication disorders are given in Table 1.

Table 1: Number of children having HRR factors having particular communication disorder

HRR Factors	Delay in speech and language skills	Hearing Impairment	Cognitive Impairment
Consanguinity	10	3	
Prematurity	3		1
Maternal Infections		2	
Family History of communication Disorder	4		1
Neonatal Jaundice		2	1

Discussion

The present study aimed to estimate the prevalence of HRR factors among children in the age range of birth to 3 years, who visited a tertiary child care center. The results of the present study is in agreement with the risk factors indicated by JCIH (2007) except consanguineous parents, which is not included in JCIH (2007). It was found that 25% of the children in the age range of birth to 1 month had consanguineous parents. Similarly, retrospective studies reported that 20.7% and 30.5% of their participants with communication disorders had parental history of consanguineous marriage [12-13]. The current study revealed that 5% of infants showed a history of birth-related risk factors for communication disorders.

In the present study, 106 (11.3%) children exhibited history of infections like meningitis, encephalitis, mumps or measles, Cytomegalovirus (CMV) which are known to be

risk factors leading to sensorineural hearing impairment. This is in the similar lines with the results of the study discovered that 9.4 percent of the population with hearing impairment had a history of maternal infection in their study population [14]. Further, study reported that 79 (8.4%) children showed a history of hyperbilirubinemia during their post-natal period, which was considered as a major risk factor for communication disorders in children, as reported by the JCIH (2007) [6, 15]. It was found that 50 (5.3%) children in the group of 1 month to 3 years presented with a family history of communication disorder.

In the present study, follow up evaluation revealed that 15 children (1.53%) exhibited some form of communication disorders. A retrospective study described that 75.5% of their studied population had exhibited more than one HRR factors, and 24.5% of them did not show any HRR factors [12]. Various studies have established that the use of high-

risk registers as the basis of infant hearing screening programs detected only 50% of infants with significant hearing loss [2-4]. Another study reported the sensitivity and specificity of HRR as 65 percent and 75 percent correspondingly [16]. The discrepancy of results in the current study might be due to the difference in population studied. All these studies examined the presence of HRR factors among the population diagnosed as having some form of communication disorder. However, the current study was carried out in a general population. This might have resulted in a lower sensitivity of HRR factors in identifying communication disorders in the current study.

Conclusion

It has been determined that 30 percent of children who visit a tertiary health care facility have significant risk factors for communication disorders. As a result, these at-risk children should be regularly followed. The low sensitivity of HRR in detecting communication disorders, on the other hand, needs screening regardless of risk.

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