00808

GENETIC

The effect of birth order on hearing of infants with consanguineous marriage (1 to 36 months old)

Parisa Rasouli Fard[1], Alireza Faghan, Shamsollah Nouripour [1- Assistant Professor, Department of Audiology, School of Rehabilitation Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Purpose: We aim to investigate whether second or third-born children of parents with consanguineous marriages have a higher likelihood of developing hearing loss compared to first-born children, while considering the absence of other risk factors.

Method: In this case control study, Parents of 65 children with a history of consanguineous marriage were administered a questionnaire regarding their prenatal, perinatal, and postnatal conditions. The children underwent hearing tests using ABR and DP-OAE. Children exhibiting hearing level greater than 20 dB NHL were classified as hearing impaired. Normal hearing infants were assigned to the control group. Each individual in the experimental group was matched with an individual in the control group.

Results: The results of hearing evaluation using DP-OAE were uncertain. ABR recordings played a crucial role in the final diagnosis, revealing mild-to-profound hearing loss in 20 infants (30%). Among these 20 infants with hearing loss, 15 (75%) were not first-born children. The interaction between birth order and hearing loss in children was significant with $p \leq 0.01$.

Conclusion: It appears that environmental factors, including the mother's age and prolonged exposure to various toxins, contribute to this phenomenon. Notably, parents who engage in consanguineous marriage are more likely to have children with congenital hearing loss, with higher risks observed for second or third-born children.

Objectives

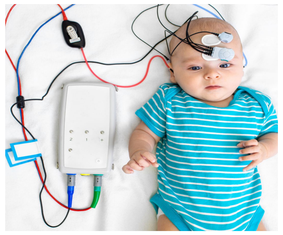
This study aims to investigate whether birth order influences children's hearing levels. Establishing guidelines and providing appropriate consultations for parents in consanguineous marriages who believe their first child's lack of disabilities implies no cause for concern is crucial for Audiologists.

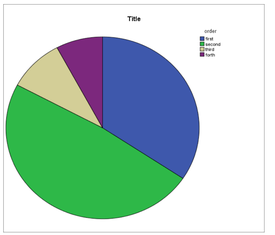
Methods and Materials

This is a case-control study conducted at Mofid Children's Hospital in Tehran, Iran. The study involved 95 infants aged 1 to 36 months old.These tests included Auditory Brainstem Response (ABR) and Otoacoustic Emissions (OAE) to assess their inner ear and auditory nervous system.

Results

Among the 95 patients with consanguineous marriages, 19 infants were excluded due to the presence of other risk factors, and 7 patients were excluded due to missing data. Of the remaining 69 patients, 29 (42%) exhibited various degrees of hearing loss. Among the first-born children in group control (22 cases), 29% experienced hearing loss, while among the second or higher-born children (47 cases), the incidence of hearing loss was higher at 48%. This demonstrates a significant correlation between birth order and hearing loss, with a p-value of less than 0.05.





Genetic factors are responsible for approximately 50-60% of hearing loss cases, with more than 100 genes identified as causative agents for non-syndromic hearing loss [a]. Among these genes, GIPC3, encoding a 312 amino acid protein, is associated with non-syndromic hearing loss.

Conclusion

In conclusion, this study offers valuable insights into the link between birth order and hearing loss among infants born to consanguineous couples. It underscores the importance of increased awareness, genetic counseling, and early intervention for at-risk families, with a specific focus on second and third-born children in these unions. Further research is warranted to explore the intricate genetic and environmental factors contributing to this phenomenon and to develop effective preventive strategies and interventions for affected families.

References

[1] Harlor AD Jr, Bower C; Committee on Practice and Ambulatory Medicine; Section on Otolaryngology-Head and Neck Surgery. Hearing assessment in infants and children: recommendations beyond neonatal screening. Pediatrics. 2009 Oct;124(4):1252-63. doi: 10.1542/peds.2009-1997. Epub 2009 Sep 28. PMID: 19786460.
[2] Lotfi Y, Mehrkian S. Hearing Impairments in Consanguineous Marriage. Iranian Rehabilitation Journal 2004; 2 (1) :9-14. URL: http://irj.uswr.ac.ir/article-1-643-en.html
[3] Bittles A. Consanguinity and its relevance to clinical genetics. Clin. Genet.200160:89e98.

19›22 September 2024
Paris, France
CNIT Paris La Défense