



ORIGINAL RESEARCH PAPER

Otorhinolaryngology

HEARING IMPAIRMENT IN DIFFERENT PAEDIATRIC AGE GROUPS- AN OAE BASED STUDY

KEY WORDS: Hearing , Incidence , OAE

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ABSTRACT

Background: Hearing plays an important role for cognitive development of the child. A child learns to speak based on what he hears since birth. The aim of the study is to find out the incidence of otoacoustic emission (OAE) diagnosed hearing impairment with reference to different age groups in paediatric patients presenting with various morbidities. **Materials and methods:** A study was conducted among 60 children attending the department of Otorhinolaryngology, Silchar Medical College and Hospital. Otoacoustic emission (OAE) was done in both the ears and the result was recorded as PASS and FAIL. **Result:** Age wise distribution of hearing was done based on OAE findings and was found to be significant (p value 0.05). **Conclusion:** Screening of hearing is an important tool for assessment of hearing impairment in children.

INTRODUCTION

Hearing plays an important role for children in learning speech and language, socialization and cognitive development(1). The child learns to speak based on what he hears since birth. If there is hearing loss then this will result in disturbance of speech, language, cognitive, social and emotional development of the child. Hearing loss is also known as " the invisible disability" as it is different from that of other disabilities and often goes undetected(1).

Children with impaired hearing, present delays in language learning and general development(2). This problem can only be prevented by early diagnosis and management(2). Otoacoustic emission (OAE) is generally appropriate for screening of neonates as it is non-invasive and easy to use. Children who are diagnosed and rehabilitated sooner depict better language and behavioural skills than children diagnosed late(2).

AIM AND OBJECTIVES

To find out the incidence of OAE diagnosed hearing impairment in different age groups of paediatric patients presenting with various morbidities.

MATERIALS AND METHODS

A one year prospective observational study for hearing assessment with the help of OAE, was conducted in the department of Otorhinolaryngology, Silchar Medical College and Hospital in 60 children. Written and informed consent was taken before the procedure. Ethical clearance was taken from the institution prior to study.

OAE was done by using TITAN (True hybrid) OAE machine of INTERACOUSTICS. A probe was inserted into both external auditory canals alternately and the responses of outer hair cells were recorded. OAE test results were noted as either PASS or FAIL(3). A child with bilateral ear PASS result suggests normal hair cell function. These children were not advised to follow up. Children who were FAILED in the initial screening were subjected to second screening with OAE after one month.

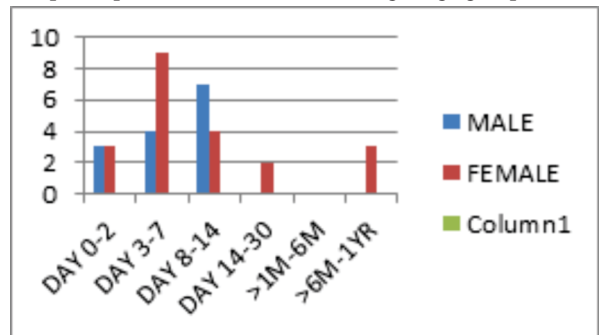
RESULT

1. Age Wise Distribution Of Study Population

Table 1

	MALE (n = 32)	FEMALE (n=28)
DAY 0 -2	3	3
DAY 3- 7	4	9
DAY 8-14	7	4
DAY 14 - 30	0	2
>1 M - 6 M	0	0
>6M - 1 YRS	0	3
>1 YR - 2 YRS	0	0
>2YRS - 3 YRS	2	0
>3YRS -4YRS	1	1
>4YRS - 5 YRS	2	0
>5YRS - 6YRS	3	1
>6YRS -7 YRS	0	1
>7YRS - 8YRS	3	0
>8YRS -9YRS	1	1
>9YRS -10YRS	3	1
>10YRS -11 YRS	1	0
>11YRS - 12 YRS	2	2

The above table shows age wise distribution of study population. A total of 60 participants were taken. Among them, 32 were male participants and 28 were female participants . The participants were divided according to age group .



2) Clinical Presentation Of Study Population (N= 60)

S.L.No	Presentations	Frequency	Percentage (%)
1	Respiratory Distress	28	43
2	LBW	31	47.69
3	Neonatal Jaundice	9	13.84

4	Nicu Stay	35	53.84
5	Seizures	21	32.3
6	Full Term	40	61.5
7	Pre Term	25	38.46
8	CS Delivery	20	30.76
9	Vaginal Delivery	45	69.2
10	Birth Trauma	1	1.53
11	Drowsy/ Lethargic	6	9.23
12	Active / Alert	59	90.7

Among the clinical presentations, 90.7% of children were active or alert, 69.2% of children were delivered vaginally and 61.5% of children were full term. Children who suffered from birth trauma were least i.e. 1.53% .

3) Age Wise Distribution Of Hearing Based On Oae Findings N=60

	PASS	FAIL	Chi square value	P value
NEONATES	36(97.2%)	1	16.616	0.005
>6M - 1YR	3(100%)	0		
>2 YRS -3YRS	2(100%)	0		
>3YRS-4YRS	2(100%)	0		
>4YRS-5YRS	0	2(100%)		
>5YRS -6YRS	2(50%)	2(50%)		
>6YRS -7YRS	1(100%)	0		
>7YRS -8YRS	2(66.6%)	1(33.3%)		
>8YRS -9YRS	1(50%)	1(50%)		
>9YRS-10YRS	4(100%)	0		
>10YRS -11YRS	0	1(100%)		
>11YRS -12 YRS	0	4(100%)		

In the study, 97.2% of neonates passed the test, 100% Of children of the age group >6M to 1 year, >2yrs to 3yrs, >3yrs to 4yrs, >6yrs to 7yrs, >9yrs to 10yrs passed the OAE test. 100% of the children belonging to age group >4yrs to 5 yrs , >10yrs to 11 yrs and > 11yrs to 12 yrs have failed the OAE test. Chi square test is done and the p value is found to be 0.005 which suggest that there is significant association of OAE findings with age.

DISCUSSION

In the study, the various clinical presentations of the study population were Respiratory distress, LBW, Neonatal jaundice, NICU stay, seizures, full term, preterm , CS Delivery, Vaginal delivery, Birth trauma, Drowsy/lethargic and Active /Alert. Among the clinical presentations , 90.7% of children were active/alert ,69.2% of children were delivered vaginally and 61.5% of children were full term. The percentage of children who suffered from birth trauma were least i.e. 1.53%. In the present study, hearing loss was not associated with mode of delivery that is LSCS and normal delivery , which is similar to study of Chavan R.P et al. and Guven study.(3)

In the study, age wise distribution of the study population was done. A total of 60 participants were taken in the study and among them 32 were male and 28 were female. Similar study of ChavanR.P et.al had 188 male and 142 female infants.This shows that male child are given more importance and are prioritized for screening for hearing impairment.

In the study age wise distribution of the study population is done based on OAE findings. 97.2% of neonates passed the test, 100% of children of the age group >6M to 1yr ,>2yrs to 3yrs, >3yrs to 4yrs , >6yrs to 7yrs, >9yrs to 10yrs had passed the OAE test. 100% of the children belonging to age group >4yrs to 5yrs, >10yrs to 11yrs and >11yrs to 12yrs have failed the OAE test.The Chi square test was done and the P value was found to be 0.005 which suggested that there was significant association of OAE findings with age.

CONCLUSION

We found that hearing loss is more common in children presenting with low birth weight followed by respiratory

distress and preterm. The hearing loss was more in the age group of 4-5 years, 10-11 years and 11-12 years. Therefore, screening of hearing is important for early identification of hearing loss in children.

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