



## Four Cases of Moderate Sensorineural Hearing Loss among Students of the Special School for Deaf Children in Makassar Indonesia

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**Received:** April 30, 2019; **Published:** June 06, 2019

### Abstract

Approximately one to two newborns per one thousand newborns have moderate, severe or profound hearing loss. For children with mild-moderate or unilateral hearing loss, it was not unusual to find that they were not identified as hard of hearing until kindergarten. The failure to identify hearing loss at a young age can have serious implications for a child's speech.

We assess hearing of students in two special school for deaf in Makassar and pure tone audiometry revealed moderate sensorineural hearing loss in four out of 94 students (4,25%). Additional tests; tympanometry, otoacoustic emission, and auditory brainstem response tests were also performed. One of four students with bilateral moderate hearing loss fitted of hearing aid since 10 years old and three of them never using hearing aid.

Unfortunately, as four students with moderate hearing loss were sent to special school for the Deaf, the opportunity to have good speaking skill like in the normal school is very low and all of them prefer to use sign language than speak even though one of them use hearing aid.

If they are getting an early diagnosis and appropriate intervention they can have good speaking skill, significant residual speech, language skills and enter the school for normal.

**Keywords:** Moderate Hearing Loss; Special School for Deaf; Early Intervention

### Introduction

Most children who have severe to profound hearing loss do not developed speech. They are usually sent to special school for the Deaf where sign language is the main form of communication. However, there are a number of children who have moderate hearing loss may have poor speech and communication skills are sent to special school for Deaf because of delayed identification of hearing impairment and were not given early amplification and habilitation. These children would have developed normal hearing and speech had they been properly identified and have early amplification and habilitation. Unfortunately, as they were sent to special school for the Deaf, they communicate using sign language and their potential to developed normal hearing and speech is suppressed.

### Materials and Methods

We collect data of hearing in 94 students of special school for Deaf. Physical, ENT examination and audiometric evaluation were performed for each students and auditory brainstem response test for younger children. Additional tests included tympanometry, distorsion product otoacoustic emission measurements to eliminate any confounding peripheral hearing pathologies.

### Results and Discussion

Pure tone audiometry demonstrated on table 1

Tympanometry of four students revealed normal bilaterally (type A).

Subject	Gender	Level of hearing loss	
		Right	Left
A	Male	Moderate (50-55 dB)	Moderate to Severe (55-70 dB)
B	Female	Moderate (45-55 dB)	moderate (50-55dB)
C	Female	Severe (70-80 dB)	Moderate severe (60-65 dB)
D	Male	Profound (90-100 dB)	Moderate (50-55 dB)

**Table 1:** Level of hearing of four students in average pure tone audiometry assessment at 4 frequencies (500 Hz, 1000Hz, 2000 Hz and 4000 Hz).

Distortion product otoacoustic emissions (DPOAEs) were absent bilaterally in four students.

- **Case A:** A male 20 years, using hearing aid since 10 years old, enter the special school for Deaf at 8 years old. He can speak fluently and many of his words is understandable, still incomplete in high frequency words but he still uses sign language if he talk to other students and teachers.
- **Case B:** A girl 22 years, she enters the special school for Deaf at 9 years, she never tested hearing before and using hearing aids. She can speak with many words and her speech is understandable but still not complete in words with compound high frequencies. She prefers to use sign language to communicate with friends and teachers.
- **Case C:** A girl 18 years, never using hearing aid, she enters special school at 8 years olds. She use sign language as a main communication but still try to speak to normal people even though more of her speech is not complete and difficult to understand.
- **Case D:** A male, 22 years, enter the special school for Deaf at 10 years old. He never using hearing aid and ability in speech is poor, he prefer to communicate with sign language than speech but still have a few understandable simply words.

**Discussion**

Hearing loss that occurs early in life affect the development of speech and language, academic achievement, social skills, behavior and emotional development. The degree of problems will have an impact on the adolescent who has hearing loss [1-3].

In low- and middle income countries (where the prevalence of preventable hearing loss is substantially higher than in high-

income countries), most children who have a hearing loss are not identified until they enter primary school or at a later stage [4] same condition with other developing countries, our country have not implemented universal newborn hearing screening to detecting hearing loss early and supporting identified newborn and preschool children as shown in our study, most of the students in special school for Deaf have not tested their hearing until they enter the school.

Research by Dr. Matkin., *et al*, for instance, indicates that “a child with an unaided with 50 dB loss (moderate hearing loss) can miss 80% to 100% of the speech signal. As we found in four out of 94 students of the special school for Deaf which have moderate sensorineural hearing loss with delayed identification and delayed/without intervention, they have disability in speech communication. Consequently, as they were sent to the special school for deaf where they were taught to communicate using sign language and lip reading and their potential to developed normal hearing and speech is suppressed.

Before government laws have been established to assure that children with “disabilities” should have hearing test before enter the special school for deaf, most of the students of the special school for deaf children in Makassar never tested their hearing, the parents and the teachers did not know the hearing condition of the children than most of the students in the special school for Deaf have not fitting hearing aid. If they are getting an early diagnosis and appropriate intervention they can have good speaking skill, significant residual speech, language skills and enter the school for normal.

They lack opportunity to have good speaking skill like in the normal school and finally the students prefer to use sign language than speak even though some of them use hearing aid.

Children who are hard of hearing (mild to moderate hearing loss) with the early identification of and appropriate intervention can often “pass” as someone with normal hearing. Interventions to reduce the occurrence of communication disabilities associated with hearing impairment are most successful if affected children are identified early, ideally during the first few months of life [4-6].

Diego J Santana identified obstacle early detection in developing countries such as hearing loss is low priority, lack of resources and limited financial resources, lack of awareness (health worker, parents and community are not aware) and lack of supporting services [4].

## Conclusion

It is well established that children with moderate hearing loss can develop better hearing and speech if they have been properly identified and early amplification and undergo speech therapy for habilitation. Stakeholder, professionals and parents are working collaboratively to refine and develop a seamless and effective system for screening, detection, intervention, and education.

## Acknowledgements

We thanks all the students and the teachers of school for the Deaf (SLB-Pembina Parangtambung and SLB Cendrawasih) in Makassar, Indonesia. Dr.Linda kodrat, O.R.L and all the staff of Labuang Baji hospital Makassar. PT. ABDI Makassar, Indonesia.

## Conflict of Interest

We declare that there is no conflict of interest related to this research.

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**Volume 3 Issue 7 July 2019**

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