

# Hearing Impairment In Preschool Children In Nigeria

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## Abstract

A group of 479 preschool children were tested for hearing impairment in a sound-treated environment at the University of Ibadan in Nigeria. Of the total, 86% (379) showed signs of impaired hearing, with a mean hearing threshold of 63.4 dB below normal. Abnormalities of the middle ear were found in 13. In the majority who had hearing impairment, infectious illnesses during the first 12 months of life were considered to be the cause. Although this level of impairment has been shown to be correctable by use of a hearing aid, the practice in Nigeria has been to place these children in schools for the deaf. In this setting the children have no opportunity to use their residual hearing or to develop speech. In Nigeria no program exists for the systematic identification of hearing-impaired children so countless resources are wasted not only in institutionalizing the children but also in depriving them of the chance for normal, productive lives.

## Introduction

The impact of auditory deprivation in children has only recently been fully understood. If unrecognized or untreated, it stunts intellectual growth, impairs emotional maturation, limits the development of creative and occupational skills and diminishes the quality of life. Thus, "deafness" in childhood produces multiple handicaps, the greatest of which is the inability to communicate verbally.

Speech is an acquired skill, learned through the ear. A child learns to talk because (and as) he or she hears. The degree of handicap produced by hearing loss depends on time of onset. The first two years of life are crucial (Lenneberg, 1967; Bakare, 1983).

A child, who can hear normally and has no intellectual handicap, is putting words together in sentences by about age 18 months and is a sophisticated speaker and listener by age four years. Mindel (1967) observed that a deaf child five years old can acquire a speaking vocabulary of only about 200 words and will have almost no knowledge of sentence structure. A hearing child at the same age has a vocabulary of 5000 to 26,000 words and the skills to combine them into meaningful sentences.

The result for the untreated deaf child is a life of limited options: in the United States, for example, 80% of the deaf population are engaged in manual labour. The figure for the general population is 50% (Schwab, 1977).

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The key to improving the outlook for people with impaired hearing is to recognize the problem early and to provide a means (hearing aid) to amplify sounds so that delays are minimized in development of speech. Ling (1978) suggested that children with an impairment of 65 dB can still develop speech and language if provided with hearing aids. Early recognition and treatment of hearing impairment is therefore an important focus.

At the University of Ibadan in Nigeria, data have been gathered to determine how many preschool children referred to the Audiological Clinic due to serious communication problems have clinically correctable hearing impairment. The children come from across Nigeria, a country with more than 100 million people.

## Materials and Methods

During a period of 30 months from August 1983 to July 1985, 439 children between ages 12 and 68 months were referred by otologists, pediatricians or were brought to the clinic by their parents.

All the hearing tests were performed at the clinic in a sound-treated, double-walled room (IAC 1403 ACT). Because of the differences in ages of the children, a combination of tests to determine the speech-hearing thresholds of the group were used. These included routine reflex; visual reinforcement audiometry; tangible reinforcement operant conditioning audiometry; and brain stem evoked response audiometry. All of the tests have been described in the literature (DiCarlo and Bradley, 1961; Lloyd et al., 1968; Suzuki and Ogiba, 1969; Bakare, 1983). Masking was used for children who showed evidence of imbalance between the two ears. Bone-conduction and tympanometric assessments were used occasionally for cases where developmental abnormalities were noted in the middle ear or other structures.

The findings for the 439 children seen during the 30 months were validated in a subsequent test and were analyzed. The data for pure-tone thresholds in the better ear at 500, 1000 and 2000 Hz — the so-called speech frequencies — were averaged; this procedure has been shown to be useful for the type of interpretations made in this investigation (Pauls and Hardy, 1953). The number of hearing-impaired children and their potential speech-hearing thresholds were recorded.

## Results

Of the 439 children tested, 60 (14%) were found to have normal auditory function and were deemed to have causes other than impaired hearing for their difficulties in

communication. This group consisted of children who had cerebral palsy, learning disabilities and psychological disturbances.

Of the 379 children (86%) who suffered from some hearing impairment, 13 had abnormalities of the middle ear and the rest exhibited sensorineural or mixed hearing losses. Where the causes could be determined, the impairment was judged to be congenital (inherited or a result of maternal rubella, drug ingestion or uterine disturbances during the first trimester of pregnancy); a result of neonatal hypoxia, erythroblastosis or trauma; or viral. Viral infections occurring during the first 12 months of life were considered to be the major cause of impairment. The etiology of hearing impairment was unknown in 123 (32%) (Table 1).

From the averages of the findings at 500, 1000 and 2000 Hz, the 379 children were grouped into four categories according to their level of hearing impairment (Ling, 1978) (Table 2). The group with mild impairment hear some loud voices and speech sounds, and the group with moderate hearing impairment hear loud voices at a distance of 1 m. but miss most speech sounds at normal conversational level. The group with severe hearing losses may hear loud environmental noises; the group with profound losses fail to hear even loud environmental sounds but sometimes respond to the vibration produced by loud music and other environmental sounds.

Table 1. Causes of hearing loss in 379 preschool children in Nigeria.

Cause	Number	% of Total
Unknown	123	32
Congenital	110	29
Meningitis	37	10
High fever	26	7
Infantile measles	47	12
Mumps	8	2
Pneumonia	5	1
Otitis media	13	3
Other	10	3

Table 2. Classification of hearing impairment in 379 preschool children. (N=379)

Hearing Loss (dB)	Degree of Impairment	No. of Children	% of Total
20-40	Mild	42	11
40-65	Moderate	140	37
65-95	Severe	174	46
95-110	Profound	23	6

## Discussion

In the past, all children who were believed to have impaired hearing were sent to schools for the deaf — many of the children not ever having had a hearing evaluation. It is likely that children classified as deaf and attending schools for the deaf all over the country are only functionally deaf because they have not used their residual hearing. The ability to hear sounds is a function of the auditory organ, but the ability to decode language is a function of the cortex and is a learning process (Pauls and Hardy, 1953). In an earlier screening of more than 1000 children, 300 were found to have hearing thresholds that were within 75 dB of normal.

Hearing impaired children with speech-hearing thresholds of 75 dB below normal can learn to speak through auditory training supplemented by lip reading. This means that in this study of 379 children, those with mild and moderate impairment and about 23% of those with severe impairment could learn to communicate verbally if supplied with a hearing aid and provided with special training. An approach that centred on home and daily activities could enable these children to develop functional speech within 2-3 years. In other words, a total of 71% (268 children) of the group could be educated in regular schools if provided with some special help in communicative skills and language. The waste of human and financial resources brought about by the lack of auditory testing and educational programs for children who have mild to moderate impairment is unacceptable in any society but is particularly debilitating in developing countries such as Nigeria where resources need to be carefully allocated and conserved.

For the group of children whose thresholds were more than 75 dB below normal, communication must be taught principally through vision. Such children would benefit from the total communication procedures being haphazardly used in most of the schools for the deaf in Nigeria.

Because the technology is now available to test young children, screening should begin much earlier than at present in Nigeria, and parents, and health care workers, should be encouraged to watch for signs of hearing impairment and to report them early. Hearing aids should be prescribed and fitted as soon as impairments are detected. Otherwise, the country will continue to channel resources into institutional care for individuals who could function outside and who are, in fact, probably being robbed of the potential to communicate with speech.

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