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BENEFITS OF EARLY AUDIOLOGICAL INTERVENTION TO INCLUSION OF CHILDREN WITH HEARING IMPAIRMENT

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Abstract

It has been established by scholars that hearing loss can be detected from as early as prenatal stage of life. This is an aspect of early intervention services for children from age 0 – 3 years. Children whose hearing losses are attended to early enough are velop faster in terms of speech, hearing and language. This paper addressed the concept of early audiological intervention and inclusion of children with hearing impairment, benefits of early audiological intervention to children with hearing impairment, roles of audiologists and key components of early audiological intervention. Recommendations were made based on the submission of the authors.

Key Words:- Early Audiological Intervention, hearing loss, hearing impairment, language Development.

INTRODUCTION

The sense of hearing is very important to the existence of humans. Therefore, loss of hearing may have adverse effect on children's social, emotional, speech and language development. Hearing loss has a lot of negative effect on those suffering from it. Olubela, Alade and Adediran (2003) observed that it affects several aspects of the lives of those suffering from hearing loss. According to them, though an inconspicuous sensory disability, it does affect the victim overtly. They opined that hearing loss like any other disabilities do hinder the normal capability expected of those suffering it. Hearing loss, no matter the age of onset, do affect the individual's psychosocial disposition, communication ability, adjustment capabilities and educational achievement.

It is obvious that hearing loss in children, if not detected early by parents and professionals could lead to educational retardation, speech and language difficulties, emotional problems and social exclusion. This therefore, makes early audiological intervention very crucial to the overall development of the child. Late identification of hearing loss or lack of early intervention services can negatively impact speech and language

development, academic achievement, and social-emotional development, (Yoshinaga, Sedey, Coulter & Mehl (1998). Therefore, the interventions programmes for the child should be early enough, so that the auditory system of the child could be stimulated. The most critical time for stimulating the hearing centers in the brain is during the first few months of life (Shama, Gilley, Dorman & Baldwin, 2007). This paper there, addressed the benefits of early audiological interventions to the inclusion of children with hearing impairment.

Early Audiological Intervention

Early intervention means services and support provided as early as possible, to enhance the family's ability to meet the developmental needs of their child. Early intervention services and support are designed to identify a disability, delay, or risk-factors which may lead to delay. It provides the family's choice of interventions to maximize the child's optimal growth and development. It is a coordinated and comprehensive system of programmes, services and resources that are designed to meet the physical, intellectual, language, speech, hearing, social and emotional needs of children from birth to three years who have been identified as having a developmental

delay or who are at risk for developing a delay. The services offered during early intervention could be remedial or preventive in nature-remediating existing developmental problems or preventing their occurrence.

EAI refers to screening procedures for new born infants to detect whether they suffer hearing defect or not. Most children who are born with a hearing loss can be diagnosed through a hearing screening. Hearing screening for newborn before they leave the hospital is becoming a must in most developed countries (Tali, Pal, Sengupta & Bhutia, 2012). Obviously, without such programme, average age of detection of significant hearing loss is approximately 14 months. Most recommendations for early hearing detection and intervention include universal screening by one month of age, detection before three months and appropriate intervention no later than six months. Such screening tests provide a quick, cost effective and reliable way to separate people into a pass group or a fail group, guiding further management. Those who pass hearing screenings are presumed to have no hearing loss while those who fail undergo a detailed evaluation by an audiologist and may need further follow up and intervention.

Early audiological intervention helps the children with hearing loss or those who are at risk to live improved quality of life. The expansion of newborn hearing screening means that fewer children now miss the advantages of an early start in programming (Nelson, Boygatso & Nygren, 2008). Parents and caregivers who discover their children's hearing abilities in infancy have the potential to provide them with the same quality of early life experiences as their hearing peers. Families who access timely and comprehensive services from professionals knowledgeable about early development are more likely to witness greater progress in many areas of development than those without similar opportunities.

Early Symptoms of Hearing Loss in Children and the Need for Early Audiological Intervention

Parents and professionals should watch out signs of hearing loss in children in order to intervene as early as possible. Alade (2005) in Isaiah (2011) identified the following signs of hearing loss in children:

- if a child complains of ear ache, or he has a visible discharge from the ear.
- if a child appears to day-dream and drift off, or is more alert when positioned close to the teacher.
- if he watches the speaker's face for clues and has difficulty listening to a message.
- when a child misunderstands or gives inappropriate responses, particularly if a sequence of spoken instruction is given.
- if a child appears inattentive or restless or distracts others, and is much more responsive in quiet conditions or small groups.
- the child may not turn immediately when called

by name, unless other visible signals are given.

Roles of Audiologists in Early Audiological Intervention

The audiologists play significant roles in early audiological intervention for children. These roles include:

- management of newborn hearing screening programmes.
- quality assessment
- service coordination
- audiological diagnosis and treatment including the timely fitting and monitoring of amplification and other sensory devices.
- timely follow-up (Joint Committee on Infant Hearing, 2007)

Benefits of Early Audiological Intervention for Children with Hearing Impairment

Early audiology intervention is an essential part of oral/aural rehabilitation programmes for children with hearing impairment. It also helps the child to socialize with the other members of his or her environment, since hearing is very crucial to understanding the speech of others. Furthermore, it helps the speech and language development of children with hearing impairment,

Scholars have found out other benefits of early audiological intervention. Infants identified with hearing loss can be fit with amplification as young as 4 weeks of age, with appropriate early intervention. For instance, children with hearing loss can be mainstreamed in regular primary and secondary education classrooms (Quigley, 1978). Research has concluded that children that are born with a hearing loss who are identified and given appropriate intervention before 6 months of age demonstrated significantly better speech and reading comprehension than children identified after 6 months of age (Yoshinaga, *et al.*, 1998).

Further, mild hearing loss can significantly interfere with the reception of spoken language and education performance. Research indicates that children with unilateral hearing loss (that is, loss of hearing in one ear) are ten times as likely to be held back at least one grade compared to children with normal hearing. (Oyer, Oyer & Matkin, 1988).

Similarly, academic achievement lags have been reported for children with even slight hearing loss. Children with mild hearing loss miss 25%-50% of speech in the classroom and may be inappropriately labeled as having a behaviour problem (Quigley, 1978, Flexer, 1994).

In the past, children with congenital hearing loss were typically not identified until they were 2-years old. Such late identification results in serious negative consequences the United States Department of Human Services (2007) noted that it is difficult if not impossible for many children with congenital hearing loss to acquire

the fundamental language, social, and cognitive skills that provide the foundation for later schooling and success in society.

When early identification and intervention occur, children with hearing impairment make dramatic progress, are more successful in school, and become more productive members of the society.

Key Components in Diagnostic Audiological Evaluation of Infants and Children

Joint Committee on Infant Hearing, (2007) recommended the following key components in diagnostic audiological evaluation of infants and children:

Case History Documentation

The audiologist will collect information about family history of hearing loss, conditions that occurred during pregnancy including maternal illness, complications that occurred during labour or delivery.

Auditory Brainstem Response (ABR)

ABR testing is an electrophysiological measurement that allows the audiologist to obtain information about the condition of the inner ear and/or auditory nerve. It is the most critical procedure in the initial test battery because it is an accurate and reliable predictor of hearing loss in infants who are too young to respond to behavioural testing. ABR should include clicks, tone bursts and bone conduction testing. The ABR measurement provides information on the degree, type and configuration of a hearing loss and allows the audiologist to fit an infant with a hearing aid when needed.

Generally, infants less than six months of age do not need sedation for this test. When sedation is needed, the ABR is conducted in a special clinic room or hospital operating room. In either case, a physician must be on site and a medical professional must monitor the infant's vital signs while the audiologist is performing the ABR. They are helpful techniques for preparing an infant for an ABR (with and without sedation).

Auditory Steady State Responses (ASSR)

ASSR testing is another electrophysiologic measurement of a baby's hearing. The benefit of the ASSR is that the results may provide more frequent-specific threshold information for infants who have severe to profound hearing losses. This enables the audiologist to have more precise data to proceed with hearing aid fittings or determining cochlear implant candidacy. At the present time, ASSR is not available in all audiological clinics. The Joint Committee on Infant Hearing (JCIH) 2007 Position Statement does not recommend this procedure as the sole measure of auditory status in newborn and infant populations. Like ABR assessment, infants over six months of age may need to be sedated for ASSR testing.

Otoacoustic Emissions (OAE)

A cochlea that is functioning normally not only receives sound, it also produces low-intensity, measurable sounds called OAEs. OAEs are absent when an infant/child has a sensorineural hearing loss of 30dBHL or greater. It is important to note that middle ear fluid, or negative middle ear pressure associated with otitis media, can interfere with OAE measurement. The middle ear must be clear for OAE equipment to accurately assess cochlear functioning. The condition known as "auditory neuropathy/dys-synchrony" is diagnosed by comparing OAE results (typically normal) with ABR results (typically abnormal).

Tympanometry

Tympanometry tests the condition of the middle ear, the mobility of the eardrum (tympanic membrane) and the conduction of the middle ear bones, by creating variations of air pressure in the ear canal. When tympanometry is used with very young infants their small, soft ear canals may affect the test and give inaccurate results. Therefore, specialized equipment generating a high frequency probe tone is routinely used to increase the reliability and accuracy of tympanometry for children 0–6 months of age.

Behavioural Audiometry

As a child matures and is able to provide hearing results behaviourally, hearing information can be plotted with even greater specificity. During audiometric testing, the audiologist finds the lowest intensity level (threshold) at which a child can detect sound at different frequencies. From this information, a graphic representation of the hearing loss, called an audiogram, is created. The hearing loss will typically be classified as mild, moderate, moderately severe, severe, or profound.

For infants 6–36 months of age, visual reinforcement audiometry (VRA) is recommended in addition to the tests described previously. In VRA assessment, the infant/child is seated on a caregiver's lap in a soundproof booth. The child is trained to turn toward a toy (one that lights up and/or moves) when he/she hears a sound. Individual ear air conduction and bone conduction thresholds can be measured at all typical clinical frequencies (250, 500, 1000, 2000, 4000, 8000 Hz) or at low, mid, and high frequencies. When this testing is used, a complete audiogram can be obtained.

After about 2 years of age, a toddler can be trained for conditioned play audiometry (CPA). In this assessment, the audiologist teaches the child to drop a ball in a bucket (or engage in some other enjoyable activity) when he/she hears a tone. CPA usually results in a complete individual ear audiogram by both air and bone conduction.

Audiological Monitoring

Although universal newborn hearing screening is designed to identify infants who have congenital hearing loss, it is important to acknowledge that some infants may have mild losses that are not detected initially and become more severe over time (progressive loss). Other children experience a permanent hearing loss at some point after birth (late-onset or delayed-onset loss). If a child has unilateral, mild, or chronic conductive hearing loss or is "at risk" for progressive or delayed-onset hearing loss, audiologic monitoring is recommended.

Recommendations

In view of the foregoing, it is recommended that:

- (1) hearing screening should be part of admission requirements for school age children, in order to detect children with hearing loss and those who at risk of hearing loss.
- (2) there should be public awareness by professionals on the causes of childhood hearing loss.
- (3) screening of hearing of the unborn babies should be part of antenatal programmes for pregnant women.
- (4) early detection of hearing loss among children should be reported to professionals by parents as soon as possible in order to address the effect of such loss.
- (5) early intervention programmes and services in the hospitals and schools should include audiological assessment for children.

Conclusion

It has been established by the authors that early audiological intervention is very important in the inclusion of children with hearing impairment to the school system and the society at large, it should therefore be given the seriousness it deserves, in order to help these children maximize their potentials in their environment

References

- Alade, E. 2005. Hearing Impairment. In Onwuchekwa J.N. (Ed). A Comprehensive Text of Special Education. Ibadan Agbo Areo Publishers.
- Bess, F., Dodd-Murphy, J. & Parker, R. (1998). Children with minimal sensorineural hearing loss: prevalence, educational performance, and functional status. *Ear and Hearing*, 19 (5): 339–354.
- Flexer, C. (1994). Facilitating hearing and listening in your children. San Diego, CA: Singular.
- Isaiah, O.O. (2011). Environmental and personality factors as correlates of psychological adjustment of adolescents with hearing impairment in secondary schools in Oyo State, Nigeria. Unpublished Ph.D. Thesis, University of Ibadan, Ibadan, Nigeria.
- Joint Committee on Infant Hearing, (2007). Early Audiological Report.
- Nelson, H., Bougatsos, C. & Nygren, P. (2008). Universal newborn hearing screening: Systematic review to update the 2001 U.S. Preventive Services Task Force Recommendation. *Pediatrics*; 122: E266–E276.
- Olubela, O.J. Alade, O. and Adediran, A.O. (2003). Fostering Self-Concept and Emotional Development Towards Dynamic Self-Actualization in the Hearing Impaired Individuals. *Journal of Nigerian Association of Specialists in Management of Hearing Impairment*. 11.2: 5–9.
- Oyer, R., Oyer, A. & Matkin, N. (1988). Unilateral hearing loss: demographics and educational impact. *Language, Speech and Hearing Services in Schools*; 19: 201–209.
- Quigley, S. (1978). Effect of hearing impairment in normal language development. *Pediatric Audiology*, Englewood Cliffs, NJ: Prentice-Hall.
- Shama, A., Gilley, P.M., Dorman, M.F. & Baldwin, R. (2007). Deprivation-induced cortical reorganization in children with cochlear implants. *International Journal of Audiology*, 46(9), 494-9.
- Tali, L.P., Pal, L., Sengupta, S. & Bvhutia, C. (2012). Role of early audiological screening and intervention. *Indian Journal of Otology*; 18 vol. 3. 148–15.
- United States Department of Human Services (2007). Early Audiological Intervention reports.
- Yoshinaga-Itano, C., Sedey, A.L., Coulter, B.A. & Mehl, A.L. (1998). *Language of early and later-identified children with hearing loss. Pediatrics*; 102: 1168–1171.
- Yoshinaga-Itano, C., & Apuzzo, M.L. (1998). Identification of hearing loss after 18 months of age is not early enough. *American Annals of the Deaf*; 143(5): 380–387.