Hearing Lossin resource-limited settings: The Silent Overlooked Epidemic In Sub-Saharan African Children

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Abstract

Hearing Impairment is the most common disability reported worldwide and its consequences profoundly affect quality of life while impacting heavily on the economy. Despite this acknowledgement, priorities for healthcare in developing countries fall heavily on conditions such as malaria, tuberculosis and HIV, thus shifting attention away from other diseases and disabilities. The objective of this review was to outline key priority areas that should inform drafting policies for hearing impairment in developing countries. We undertook a literature search on PubMed, Google scholar, HINARI and Web of Science for publications discussing hearing loss in low- and middle-income countries. Search terms included "hearing loss", "primary ear hearing care", "hearing loss policies", "hearing loss prevention", "hearing loss causes" and "hearing loss detection". We did not limit the publication period. However, we excluded all publications whose content did not contribute to the objective of our work. Our findings are discussed and recommendations given

Keywords: Hearing loss, Sub - Saharian African, Children

Background

The current estimates for people with Hearing loss (HL) is 466 milllionaccording to recent statistics by the World Health Organisation (WHO) ,[1] rising 360 million people reported previously.[2] This accounts for 5.3% of the world's population [3,4] 80% of the afflicted live in low- and middle-income countries[5,6] and children account for 32 million (9%) of those afflicted. [4, 7]The nature of HLcombined with the inability to detect it by routine clinical procedures makes hearing loss "the silent, overlooked epidemic of developing countries".[8]

People with already established HL will need to undergo rehabilitation, a service accessible to less than 1 in 40 people in need of hearing aids in developing countries. [4] Consequences of HL range from poor speech and language development and social exclusion to socio-economic inequality and inability to achieve standards of living compared to peers with normal hearing. This underscores the need for early detection and treatment of treatable causes and rehabilitation for those whose hearing loss in not treatable.[9] WHO further estimates that unaddressed hearing loss costs the economies $750–790 billion globally every year. [10]

Policies and priorities

Studies suggest that cost effective and easily accessible interventions aimed at preventing HL could offer great benefits in reducing hearing disability in developing countries. [11,12] These interventions demonstrate measurable economic benefits and improved quality of life of the beneficiary, their family and the society.[7]

A discussion on interventions geared towards prevention and early intervention follows.

Awareness

Hearing loss is a silent condition that may go unnoticed well into late childhood, especially if the degree is mild to moderate. Frequently, HL is only detected at advanced age beyond 2 years or even following delays in speech and language development.[13] Moreover, most parents show low awareness with regards to ear and hearing health.[14,15] In countries where Early Hearing Detection and Intervention (EHDI) programs have not been introduced, raising awareness on HLwill stimulate healthcare providers and mothers/parents to look out for potential causes and signs, enhancing chances for prevention as well as seeking medical attention early in life for better outcomes. [16]

Prevention strategies

Three levels of prevention have been described [17-19]: Primary prevention comprising protective measures such as immunisation against diseases transmitted

in-utero, diseases such as meningitis, safe delivery, avoidance of noise and other avoidable causes of HL. Secondary prevention aims at identification and arresting progression of an already present condition that would result in HL.Tertiary prevention aims at overcoming a handicap in the face of advanced disease and disability with interventions such as rehabilitation with hearing aids and implantable hearing devices. It is important to note the importance of early school placement and its impact on quality of life. [20]

Early identification and management strategies

Approximately 123 million babies are born every year in developing countries, 737,000 of whom have Permanent Childhood Hearing Loss (PCHL).[21,22] Evidence shows that early identification of hearing problems carries a good prognosis even when treatment and rehabilitation is required.[5,23-25] Significant language improvement has been reported in children confirmed to have HL and treated or habilitated by 11 months of age, when compared to those diagnosed later.[23,25,26]

India launched a National Programme for Prevention and Control of Deafness in 2006 comprising of a 2 part protocol: 1) institution-based screening where every newborn baby or one admitted after birth is screened for HL, and 2) community based screening where babies not born in a hospital are screened when they attend immunisation clinics at 6 weeks of age.[16] Similarly, simple detection methods such as questionnaires or High Risk Screening Registries should be used in resource limited countries to raise awareness and screen infants who may require formal diagnostic testing, until institution based hearing screening becomes accessible to all.

Primary Ear and Hearing Care (PEHC)

PEHC is an initiative by the WHO aimed at providing affordable hearing health care services from the community level up to the referral level. This program focuses on raising awareness, education, screening and ensuring preventive measures are observed as well as curative measures where indicated. [17]The rationale of this program puts into consideration significantly higher complication rates and even deaths arising from preventable conditions owing to lack of awareness, disability arising from HL as well as acute shortage or even total lack of trained staff and favourable infrastructure as compared to developed countries.[18] This has been shown to be affective where task shifting and training of nurses was implemented. [27]

Maternal and child health

Evidence shows that hearing loss has a significantly higher prevalence than any other birth defect with a prevalence of as high as 4 to 6 per 1 000 live births. [21] The perinatal period may be complicated with conditions that can affect the sensory and neural organs of hearing, resulting in HL. Encouragement to attend antenatal clinics, immunisation and proper nutrition during pregnancy as well as delivery in a supervised setting are measures which would go a long way to prevent congenital HL and consequences thereof.[17]

Infections and disease control

According to a review by Monasta et al., (2012), it is estimated that globally the incidence of acute otitis media (AOM) stands at 10.85%, equivalent to 709 million new cases annually; 51% of these cases are children under five years of age. There is a great similarity of prevalence of chronic suppurative otitis media (CSOM). In Sub-Saharan Africa, these range from 0.4% to 4.2%.[28] Overall, CSOM is considered to be the most common cause of persistent mild to moderate HL among children and young people in developing countries and causes HL in more than 50% of those affected.[29] Smith WA et al., (1996) found that while 64% of schoolchildren with CSOM had HL, only 3.4% of children without CSOM had HL.[30]

Other common infections causing HL include meningitis, measles, mumps, Influenza, herpes simplex, herpes zoster, infectious mononucleosis, syphilis. To prevent HL caused by infections, there is dire need for awareness among patients, caretakers and health professionals,[14] early and proper diagnosis, effective treatment and timely forward referrals when need arises.

Ototoxicity

There is paucity of data on the prevalence of ototoxicity. However, a survey in India showed that 52.9% of 51 patients treated with Streptomycin developed HL.[31] Cytotoxics such as Cisplatin have been reported to cause bilateral severe and irreversible hearing loss in 75-100% of subjects. Aminoglycosides are linked with dose dependent irreversible death of outer hair cells of the cochlear and/ vestibulotoxicity.[32] Other drugs causing ototoxicity include antimalarial drugs, salicylates, diuretics and some ototopical medications.

Prevention strategies to curb HL caused by ototoxicity include awareness by the general public and health professionals, rational use of medication and legislation and regulation of use of drugs and medication by the government.[31]

Legislation for prevention of Noise induced hearing loss (NIHL)

With modernisation, awareness and legislature on

NIHL, occupational noise has decreased. However, exposure to social noise especially in young people is on the rise.[33] In developing countries, occupational noise is a major problem, particularly for countries where no legislature or noise regulation measures exist. Hearing conservation programmes should be established, to ensure acceptability and safety of noise levels. They must be sustained and empowered with personnel and equipment for noise regulation.[34]

Equitable distribution of resources

Policy implementation and access to improved health care are a function of several factors, including the distribution of resources. Many low and middle-income countries are faced with a significant human resource for health (HRH) challenge. The Sub-Saharan African Medical Schools Study (SAMSS), looking at the capacity to produce HRH in Africa, showed that the existing 148 medical schools in African can only graduate 10,000 doctors per year.[35] Sub-Saharan Africa accounts for 24% of the global disease burden and is served by only 3% of the global health work force. There are 13 medical doctors/100,000 population (Brazil 192/100/000; US 280/100,000).[35,36] The production, deployment, motivation and retention of an adequate skill mix in appropriate numbers remain major hurdles for many health systems especially in resource limited settings. [35]

The Lancet commission's report; "Global Health 2035: a world converging within a generation" revisits the importance for investment in health for holistic outcomes especially in low-income and middle income countries. Emphasis is placed on investing in stronger health systems and policies capable of meeting the main health challenges faced by these countries; that is, infections; reproductive-maternal-neonatal and child health; NCDs and injuries.[37] All service delivery avenues within a health system will need to be supported in the efficient delivery of the intervention packages.

We have discussed earlier in this paper some of the important interventions and policies required to improve the prevention, detection, treatment and rehabilitation of hearing loss. The infrastructure development and distribution required to achieve these aims is largely limited to the urban settings and is often inadequate. Such facilities are lacking in district hospitals serving the majority rural population. Improvement of the range and quality of existing services where they exist is also important.

Priorities informing policies

Access to basic health services is a fundamental human right, a fact long affirmed in The Alma Ata Declaration. [38] Although declared in 1978, many resource constrained countries are far from achieving this goal. Specifically, HL received attention during the48thWorld Health Assembly in 1995 and later during the 70thWorld Health Assembly in 2017.[39,40] Cognisant of 'hearing loss as a public health problem,' all aspects of HL were addressed ranging from 'development of appropriate technical guidelines' which includes prevention, development of National ear and hearing care plans and policies, to mobilisation of resources.[41] While most developing countries are yet to realise this, several countries in Africa Rwanda inclusive have seen the need, heeded the call and together with partners, have developed and launched their national ear and hearing care plan.

Conclusion and recommendations

Hearing loss is an issue of significant consequence to quality of life and economic independence in the world today, sub-Saharan Africa is no exception. Considering that more than half of HL is preventable through primary health care and given that the costs of rehabilitation are prohibitive, it is recommended that more emphasis be placed on primary prevention strategies. Policies should therefore be informed by priorities established by policy makers and health care providers working in concert for the long-term benefit of all is sustainable development goals are to be achieved.

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Conflict of interest

The authors have no conflict of interest to declare.

Contributions of the authors

KBM – Developed the idea and wrote the aspects directly related to hearing impairment.

PK– Wrote the aspect regarding policies, distribution of resources and contributed to overall presentation and editing of the manuscript.

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