Medicine and Society

Deafness: Burden, prevention and control in India

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ABSTRACT

The high burden of deafness globally and in India is largely preventable and avoidable. According to the 2005 estimates of WHO, 278 million people have disabling hearing impairment. The prevalence of deafness in Southeast Asia ranges from 4.6% to 8.8%. In India, 63 million people (6.3%) suffer from significant auditory loss. Nationwide disability surveys have estimated hearing loss to be the second most common cause of disability. A lack of skilled manpower and human resources make this problem a huge challenge. The Government of India has launched the National Programme for Prevention and Control of Deafness. This article highlights the major components of the programme with a focus on manpower development and ear service provision including rehabilitation. Since the programme is also being implemented at the primary healthcare level, it envisages a reduction in the burden of deafness and prevention of future hearing loss in India.

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SITUATION ANALYSIS OF DEAFNESS IN INDIA

In the process of global epidemiological transition, the economic burden associated with chronic diseases is on the rise, especially in low- and middle-income (LAMI) countries.[1] Deafness—one neglected chronic condition—is the most prevalent sensory disability across nations. According to the 2005 estimates of the WHO, 278 million people worldwide have disabling hearing impairment, i.e. moderate-to-profound hearing loss in both ears (i.e. >41 dB hearing loss).[2] Hearing loss is the second most common cause of years lived with disability (YLD) accounting for 4.7% of the total YLD. The problem of deafness is disproportionately high in the Southeast Asia region with a prevalence ranging from 4.6% to 8.8%.[3]

Population-based surveys in 2003 in India using the WHO protocol[4] estimated the prevalence of hearing impairment to be 6.3% or approximately 63 million people suffering from significant auditory loss.[3] The estimated prevalence of adult onset deafness in India was found to be 7.6% and childhood onset deafness to be 2%. Earlier during 1977–80, a multicentric collaborative study on the prevalence and aetiology of hearing impairment was done by the Indian Council of Medical Research (ICMR) at 4 centres: Calcutta (Kolkata), Delhi, Madras (Chennai) and Trivandrum (Thiruvananthapuram) on a total of 11 665 persons in rural areas and 10 935 in urban areas. The prevalence of hearing impairment was found to be 10.2%. Severe hearing loss accounted for 24.4% and mild hearing loss for 15.9%. Overall, rural areas showed a higher prevalence of hearing loss compared with urban areas.[5]

The National Sample Survey (NSS) 58th round (2002) surveyed disability both in urban and rural households and found that hearing disability was the second most common cause of disability after locomotor disability.[6] Hearing loss accounted for 9% of all disabilities in the urban and 10% in the rural areas. Depending upon the extent of a person's inability to hear properly, the degree of hearing disability was ascertained. It was estimated that the number of persons with hearing disability per 100 000 persons was 291; it was higher in rural (310) compared with urban regions (236). In the same survey, about 32% of people had profound (person could not hear at all or could hear only loud sounds) and 39% had severe hearing disability (person could hear only shouted words). The survey results revealed that about 7% of people were born with a hearing disability. About 56% and 62% reported the onset of hearing disability at ≥60 years of age in the rural and urban areas, respectively. The incidence of hearing disability in the past 1 year was reported to be 7 per 100 000 population.[6]

The magnitude of milder degrees of hearing loss and unilateral hearing loss would be larger than these estimates for bilateral hearing loss. The major causes of hearing loss and ear disease in India have been listed by the WHO survey.[3] Ear wax (15.9%) was the most common cause of reversible hearing loss. Non-infectious causes such as ageing and presbyacusis are the next most common causes of auditory impairment in India (10.3%). Middle ear infections such as chronic suppurative otitis media (5.2%) and serous otitis media (3%) are other leading causes of hearing loss. The other causes include dry perforation of tympanic membrane (0.5%) and bilateral genetic and congenital deafness (0.2%).

The NSS 58th round also enquired about probable causes of hearing loss in India. In about 25% and 30% cases, for rural and urban India, respectively, the probable cause was old age. Of the other reasons, ear discharge and other illnesses were identified as the cause by a comparatively large proportion of persons with hearing disability. Also, in the same survey, nearly 1% of hearing disabled persons reported German measles/rubella as the cause of hearing disability.

It has been noted by WHO[3] that half the causes of deafness are preventable and about 30%, though not preventable, are treatable or can be managed with assistive devices. Thus, about 80% of all deafness can be said to be avoidable. It has also been stated by WHO[3] that there is a shortage of human resources to address the issue of deafness. The estimated number of ENT specialists and otologists in India are 7000 and 2000, respectively. The audiometrist:population ratio was found to be 1:500 000 and the ratio of speech therapists to the deaf population was 1:200. There is also a maldistribution of personnel with more people

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located in urban than rural areas. Human resource analysis revealed that there is a need to enhance the skills and working capacity of practising doctors and other personnel.

NATIONAL RESPONSE TO PREVENTION AND CONTROL OF DEAFNESS

Considering the enormous impact of deafness on the social, economic and productive life in India due to its burden and also gaps in human resources to meet this health challenge, primary healthcare remains the strategy of choice for the provision and implementation of prevention of deafness and hearing loss in India. The Government of India initiated the National Programme for Prevention and Control of Deafness (NPPCD) in 2006. It was initially started as a pilot project and was implemented in 25 districts in 10 states and 1 union territory. It will be upscaled to include 203 districts in all states and union territories by the end of the eleventh 5-year plan (2007–12).

The NPPCD was launched with the long term objective of reducing the total disease burden of hearing impairment and deafness by 25% at the end of the eleventh 5-year plan. The programme aims to cover three levels of prevention and care: primary, secondary and tertiary ear care by provision of an appropriate response at these levels. It aims at preventing avoidable hearing loss on account of disease or injury, identifying early and treating major ear problems, and medically rehabilitating persons with deafness of all age groups. It envisages strengthening existing intersectoral linkages and developing institutional capacity for ear care services. For the prevention of auditory impairments, it promotes outreach activities and public awareness through innovative and effective information, education and communication (IEC) strategies.

The programme has been integrated along with the umbrella health mission of the Government of India—the National Rural Health Mission (NRHM)—at the state and district levels. Under the NPPCD, funds for execution of the programme are given to the state health society and programme committee of NRHM to carry out various activities through district health societies. The role of the state committee is to function as a supervisory and monitoring authority for smooth conduct of the strategies to prevent and control deafness.

The district health society and programme committee are expected to prepare a micro-plan on an ongoing basis and to operationalize programme components at the district level through coordination between different agencies and partners—government, non-government and community members.

MAJOR COMPONENTS OF THE PROGRAMME[7]

Capacity building and manpower development

Human resource development remains a key component of any national health programme. The NPPCD through the creation of trained manpower at multiple levels strengthens the workforce for efficient and effective delivery of ear care at all levels. Designated state medical colleges will act as centres of excellence for ear care interventions in selected districts where the programme is functional. ENT specialists and audiologists from designated medical college are assigned the responsibility of providing technical expertise to the programme in the district. ENT coordinators at the state medical college impart training to district ENT surgeons for 5 days under which a reinforcement of hands-on surgical training in micro-ear procedures pertaining to deafness is provided. Key procedures that can be performed at the district level are covered under this training and include myringoplasty, tympanoplasty, stapedectomy and mastoidectomy. District-level audiologists/audiometricians are provided a 2-day reorientation in diagnostic and therapeutic skills. In addition, paediatricians and obstetricians at the district hospital level and community health centre level are imparted a day's training to sensitize them to various factors responsible for loss of hearing in newborns and children with special emphasis on antenatal and perinatal care.

Primary healthcare physicians are the key players in the delivery of public health initiatives in the Indian healthcare delivery system. The NPPCD involves doctors in primary health centres (PHCs), school health schemes and those working in various industrial units in the districts for delivering ear care at the primary care level. A 2-day training programme is conducted to sensitize these personnel to their involvement in the NPPCD. Doctors are trained to manage common ear conditions using standardized guidelines. Similarly, skills in the use of an otoscope are enhanced and they are exposed to the surgical and rehabilitation services available in their district so as to refer patients to the appropriate level of care.

The involvement of grassroots workers, supervisors and community health volunteers is required to create awareness among the community about the prevention of hearing loss as well as to emphasize the need for timely care. The NPPCD sensitizes men and women multipurpose health workers at the subcentre level, public health nurses at the PHC, child development project officers, *anganwadi* workers (AWW) and their supervisors, Accredited Social Health Activists (ASHAs) and trained birth attendants. These workers are expected to play an important role in facilitating early detection and prevention of hearing loss.

The involvement of community stakeholders is vital for the use of services planned under the NPPCD. The programme apprises primary school teachers and parents of hearing/speech impaired children at the village level about ear care interventions. Teachers are also trained to provide assistance during the execution of screening camps organized for schoolchildren.

To fill up the lacunae in audiological services at the district level, the programme has proposed a post of audiometric assistant at all districts, to carry out various activities related to deafness prevention and control. For the acquisition of proper linguistic and communication skills by a young hearing impaired child, the programme has proposed a teacher to be trained and inducted for carrying out hearing and speech rehabilitation of children at the district level. The feasibility of involving interns who have finished their graduation in auditory, speech and language pathology at the All India Institute of Speech and Hearing impairment (AIISH), Mysore and Ali Yavar Jang National Institute of Hearing Handicapped (AYJNIHH), Mumbai will be explored during the implementation of the programme.

EAR SERVICE PROVISION INCLUDING REHABILITATION

Ear health promotion and prevention

To create awareness about hearing and speech problems, grassroots workers and health personnel will deliver IEC on a continuous basis to community members. Regular meetings with community-based organizations such as the *gram panchayat*, village health committee and *mahila mandals* will be conducted to sensitize them about the importance of early detection of ear problems and hearing loss. The AWWs and auxiliary nurse midwives (ANMs) will be trained about the correct posture to feed a baby so as to decrease the incidence of otitis media due to faulty feeding practices. Emphasis will be placed on timely referral of children born after a difficult labour or those who suffered birth asphyxia to screen for loss of hearing. Health workers will also be trained to assess the speech and hearing of children visiting immunization clinics and outreach activities.

Local, culture-specific innovative strategies will be adopted for sensitizing community members including school teachers.

Early detection of ear problems and management

House-to-house surveys to ascertain hearing problems in all age groups will be done by the AWWs and ASHAs, under the supervision of multipurpose workers and a record of people with deafness will be maintained. Based on an assessment schedule, school health doctors will carry out school-level screening of students of primary classes to identify and manage any diseases/problems related to the ear. Medical personnel at the primary and secondary level will be trained so as to provide adequate standardized ear care at these health facilities. The priority conditions for local management include middle ear infections and impacted wax. All persons requiring special diagnostic facilities, complicated cases and those needing surgical interventions will be referred to the district hospital. ENT doctors and audiologists at the district level will provide comprehensive ear care services. District and community health centre (CHC) level paediatricians and obstetricians trained under the programme will screen and refer any child born of a high risk pregnancy or delivery, as well as those children who are exposed to a high risk factor in infancy. By an assessment of speech milestones, paediatricians can detect hearing impairment early, apart from treating common ear problems in children. A standard set of equipment and medicines will be provided at all levels for ear care under the NPPCD. Proper referral linkages between different levels of care will be strengthened for effective delivery of services.

Community screening camps

These will be organized at the PHC/CHC/district level to screen the population for deafness and hearing impairment. These camps will also provide an opportunity to increase awareness about the prevention and control of deafness. These camps will be conducted by trained personnel along with private practitioners, wherever feasible. One screening camp will be organized every month at any healthcare level—PHC/CHC/district hospital by rotation, thus 24 camps will be organized in each district over a period of 2 years. The camps will be organized by involving key community stakeholders, *panchayat* members, *mahila mandals* and youth leaders. Non-governmental organizations (NGOs) identified by the district health society will also facilitate the organization of these camps.

Rehabilitation and hearing aid provision

Patients with complications that require tertiary care will be referred to state medical colleges. Patients whose complications are not amenable to medical or surgical correction and who require hearing aids will be fitted with the same at the district level. This will primarily include children suffering from bilateral sensorineural deafness. About 200 hearing aids will be made available in each district to be fitted to suitable persons. Older persons with presbyacusis will be provided hearing aids in collaboration with the Ministry of Social Justice and Empowerment, which provides rehabilitative services for the elderly. Wherever feasible, suitable linkages will be developed with community rehabilitation centres and district disability rehabilitation centres (DDRC) in consultation with the Rehabilitation Council of India.

Monitoring and supervision

Monitoring tools have been devised for all levels. Indicators have been developed to supervise the performance of the districts in deafness prevention and control. Monthly reports are to be generated citing progress and submitted to higher levels. On-site evaluations will also be done to provide periodic supportive supervision. Feedback will be regularly sought from allied organizations.

OTHER ACTIVITIES UNDER THE PROGRAMME

Supportive activities for other causes of deafness such as noise-induced hearing loss and congenital deafness require additional programmatic inputs. The prevention and control of these causes will be explored and introduced based on the feasibility of available interventions. A uniform policy for rubella vaccination under the national immunization programme for congenital deafness prevention will also be explored. Advocacy regarding legislation relating to noise and implementation of a hearing conservation programme will be done. To raise awareness and accord vital importance to deafness, 'noise-free days' and '*rashtriya shravan shakti diwas*' will be planned at the national level. The involvement of preschool teachers through NGOs and public–private partnership will be attempted. Inclusion of deafness awareness in textbooks at the primary and secondary school level through collaboration with the National Council of Educational Research and Training (NCERT) will be explored. Research for developing cost-effective, high quality hearing aids within the country will be promoted. Carrying out community-based studies will fill epidemiological gaps in data regarding hearing impairment and deafness. Operational research to improve implementation of the programme will be conducted at periodic intervals.

CONCLUSION

Integration of primary ear care with primary and district health systems is likely to yield the most cost-effective solutions. The strategies included in the NPPCD, if implemented with political will and strong leadership, will decrease the magnitude of ear problems and prevent avoidable deafness in India. Networking and partnerships with different organizations, professionals and personnel remain critical to the success of the programme. In the supportive environment facilitated by the launch of NPPCD, it is imperative to take firm and enthusiastic actions to reduce the burden of deafness in India.

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