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Special report

Highlights of the new WHO Report on Newborn and Infant Hearing Screening and implications for developing countries

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ABSTRACT

The Report summarizes the outcome of a recent informal consultation convened by the World Health Organization (WHO) in 2009 pursuant to the 1995 resolution of the World Health Assembly (WHA) urging Member States to promote programs for early hearing detection in babies and infants. The consultation was geared towards reaching global consensus on key principles on this subject based on the experiences and contributions of leading experts from various world regions and across relevant disciplines. After reviewing the current evidence on early hearing detection in babies and infants the Report outlined guiding principles for action by Member States covering issues such as etiology, case definition of hearing impairment, options for screening, program implementation, cost-effectiveness as well as policy and legislation. The need for context-specific adaptations of current practices in the developed world to facilitate the development of effective and culturally appropriate early hearing detection programs in developing countries was emphasized. The potential role of private-public partnerships including non-governmental organizations in designing and implementing hearing screening programs was highlighted while recognizing the necessity to develop requisite support services for infants detected with hearing impairment. Overall, the Report is likely to stimulate greater interest and progress towards early hearing detection initiatives particularly in countries where necessary actions are yet to be taken to implement the WHA resolution. However, any effort in this direction must be backed by greater professional engagement, appropriate national policies and strong involvement of WHO regional offices in developing countries.

1. Preamble

Concerned about the global burden of hearing impairment, the World Health Assembly (WHA) in 1995 passed a resolution urging Member States to "*prepare national plans for the prevention and control of major causes of avoidable hearing loss, and for early detection in babies, toddlers and children within the framework of primary health care*" [1]. However, the resolution did not propose methods of achieving the goal of early hearing detection by any Member State desirous of responding to the call. Subsequent development of otoacoustic emissions (OAE) and/or automated auditory brainstem response (AABR) and emerging evidence on optimal threshold for effective intervention facilitated the introduction of universal newborn hearing screening (UNHS) before hospital discharge in a growing number of countries in the developed world perhaps most prominently in USA.

Spurred by the growing positive evidence on the possibility of extending the proven strategies for early detection in developed countries to the rest of the world as well as advocacy by various groups and researchers working in developing countries, the World Health Organization (WHO) in November 2009 convened a meeting in Geneva of experts from various world regions and across relevant disciplines to identify and reach consensus on key issues on newborn/infant hearing screening. Also in attendance were individuals with experience in program implementation at state or country level. The group was required to review the current status on early hearing detection and recommend guiding principles for action within a public health framework. The needs and circumstances of countries that were yet to implement the subsisting WHA resolution were to be taken into consideration. The outcome was also intended to facilitate the ultimate development of "formal" WHO recommendations and technical guidance to Member States. The final version of the Report on the outcome of this informal consultation (hereinafter termed "the Report") was officially released in January 2011 [2]. It comprises three main sections: overview of issues in newborn and infant hearing screening, current approaches to hearing screening and guiding principles for action.

This special commentary was commissioned to provide a synopsis of the key elements of the Report for the benefit of the readership of this journal. In view of the significant impact usually

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associated with WHO guidelines in general on national health policies in developing countries [3,4], the possible implications of the Report in these countries were also examined briefly in this commentary. The full Report can be requested from the Prevention of Blindness and Deafness (PBD) Unit at WHO Headquarters, Geneva, Switzerland: website (http://www.who.int/pbd/deafness/en/).

2. Overview of current issues in newborn/infant hearing screening

The Report noted that the prevalence of congenital and early-onset deafness or severe-to-profound hearing impairment ranged from 0.5 to 5 per 1000 neonates or infants based on studies from various countries. Early detection was considered as an important first step in providing the affected infants with appropriate support to achieve optimal outcomes within the context of the critical period of development for the central auditory pathway. The Report highlighted the key developments towards newborn and infant hearing screening (hereinafter termed "NHS") from the 1995 WHA resolution within WHO and various supporting policy statements to date by other groups in USA and Europe. NHS was also justified on the basis of the United Nations Convention on the Rights of Persons with Disabilities adopted in 2008.

The term "newborn" or "infant" has been used in the Report to characterize the timing of the screening program and not just the target population. Thus, newborn was defined as "the first 28 days of life" while infancy was defined as "the first year of life". Like any screening initiative NHS was required to satisfy some ethical standards which include the following:

- That infant hearing impairment is a significant health problem;
- That a suitable and safe test is available and acceptable to the target population;
- That an acceptable treatment or intervention is available;
- That the requisite screening and diagnostic services are cost-effective.

The ethics of introducing NHS programs in settings where corresponding diagnostic and habilitation services are not yet fully established also needed to be examined. Paradoxically, it was acknowledged that implementing such programs boosted the development and expansion of the requisite services as demonstrated in some developed countries like USA.

The issue of cost-effectiveness was specially addressed considering the lack of relevant data from both developed and developing countries. Such data was needed especially in developing countries to determine whether NHS was affordable and guide the allocation of resources. It was noted that WHO does not rely exclusively on cost-effectiveness or cost benefit ratios but expects any proposed public health intervention such as NHS to be cost-sensitive in view of the low/limited health budget in many countries. In addition, although accurate cost-benefit analysis for quality-of-life issues such as infant hearing impairment may be difficult, the need to determine the extent of improvement in health and other outcomes attributable to NHS was emphasized. It was also noted that the decision to introduce NHS in some countries will essentially be political, particularly in settings where the current expenditure is zero and doing nothing will be perceived as costing nothing and therefore more tempting as an easy way out. However, the loss of potentially productive workforce was a real loss in all countries regardless of whether funds were being spent or not.

Other practical issues germane to the implementation of an effective NHS program in different cultural contexts were highlighted. For example, in many developing countries hospital-based NHS was likely to be constrained by the fact that majority of births occur outside conventional health facilities. Use of hearing devices such as hearing aids and cochlear implants may not be culturally acceptable to some parents resulting in preference for non-verbal communication modes such as sign language. Increased public awareness, training of health and other workers as well as public–private partnerships including active engagement of non-governmental organizations were considered as essential steps to be undertaken to effectively serve the needs of infants with hearing impairment. The need to establish quality control benchmarks was also mentioned. NHS was also to be regarded as a component of early hearing detection and intervention (EHDI) program which extends beyond the health sector. Overall, it was noted that any WHO guidance on NHS will necessarily reflect variations in national, cultural and economic circumstances of Member States.

3. Current approaches NHS worldwide

Participants at the consultative meeting presented an overview of the current status on NHS worldwide derived from reports of multi-country or national surveys and empirical research summarized as follows.

3.1. Multi-country reports

3.1.1. International Association of Logopedics and Phoniatrics (IALP)

Evidence of NHS programs at national or regional levels in Australia, Brazil, China, Germany, Philippines, Serbia, Sweden, India and USA was obtained from reports supplied by members of this association. Generally, the target case definition varies from 20 dBnHL in Brazil to 40 dBnHL in India. The screening protocol is one-stage, two-stage or three-stage with various combinations of transient-evoked otoacoustic emissions (TEOAE), distortion-product otoacoustic emissions (DPOAE) and automated auditory brainstem response (AABR) in hospital settings. Screening test is performed by a variety of personnel including nurses, audiologists, audiological technicians and physicians. NHS services are financed by governments, health insurance or directly by parents. Physiological tests are preferred over screening questionnaires or behavioral techniques.

3.1.2. International Working Group on Childhood Hearing (IGCH)

This survey focused on the status of NHS programs in Europe. EHDI has been mandated by legislation in over half of the countries in this region while it is conducted routinely in the remaining countries with varying levels of coverage. EHDI is implemented nationally in half of the countries, regionally in 30% and locally in 20%. Quality benchmarks are enforced with varying degrees across the countries. For example, screening coverage was highest (up to 80% of eligible births) in countries with national programs although only about half of those who failed the screening tests received appropriate audiological evaluation within three months of age as recommended by the Joint Committee on Infant Hearing (JCIH). Only four countries appear to provide requisite post-diagnostic intervention within the first six months of life.

3.1.3. Society for Sound Hearing of South-East Asia

This survey report under the Sound Hearing 2030 initiative covered ten countries in this region: Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Democratic Republic of Korea. With the exception of India, no national initiative for NHS is evident in all the countries. However, many institutions have undertaken pilot NHS programs but still lacked requisite capacity to deliver follow-up services. Other "pressing health priorities" *presumably related solely to child*