

The Feasibility of Opportunistic Screening for Detecting Noise-Induced Hearing Loss in Factory Workers in a Rural Area of Delhi, India

Sir,

Continuous exposure to high sound pressure levels in industrial workers is a major cause of noise-induced hearing loss (NIHL) globally that significantly reduces the quality of life and economic productivity, accounting for 4 million disability-adjusted life years worldwide.^[1,2] In developing countries like India, millions of workers are employed in industries that expose workers to hazardous sound levels (>85–90 dB) for prolonged durations without application of personal prophylactic measures that further accentuates their risk of hearing loss.^[3] Early detection of hearing loss with the cessation of hazardous sound exposure can inhibit the progression of NIHL.

The lack of periodic hearing screening of industrial workers, a high-risk group, also delays the detection of NIHL and represents a neglected public health challenge in India.^[4] Screening for NIHL can be conducted opportunistically in outpatient settings of secondary and tertiary care hospitals, but its feasibility has not been adequately explored in Indian health settings.

The present study had a cross-sectional study design conducted to ascertain the burden of NIHL and to assess the feasibility of opportunistic hearing screening among industrial workers who were reporting to the medical outpatient department (OPD) of a secondary care hospital in a rural area of Delhi for any health problems. Data were collected from December 2018 to February 2019. The occupational status of the patients reporting to the OPD was assessed consecutively. Those patients employed as workers in the industrial area in the vicinity of the hospital were further screened for hearing loss after obtaining their consent. The participants worked at medium- and small-scale industries and were mostly employed in plastic bead-making plants, small-grade cardboard recycling, and plastic and rubber factories. The sources of machine noise comprised grinders, extruders, heat panels, washers, bead-making machines, plastic injection molding machines, etc., We recruited a total of 132 male adult factory workers up to 50 years of age. The diagnosis of noise-induced sensorineural hearing loss (SNHL) was determined on pure-tone audiometry (PTA) by observing the acoustic dip in higher frequencies at 2 kHz, 4 kHz, and 8 kHz in either ear, which is considered a validated method.^[5]

The mean (standard deviation [SD]) age of the workers was 29.6 (7.7) years, their mean (SD) per capita income was INR 4000 (1000), and only 47 (35.6) workers were educated up to

high school or beyond. The median duration of employment was 8 years. The length of self-reported hazardous noise exposure in the workplace ranged from 7 to 10 h per workday, and 104 (78.8%) workers reported such exposure for > 8 h on a typical workday. Eight (6%) workers were aware of the risk of hearing loss on exposure to loud sounds, and only seven (5.3%) workers reported wearing hearing protection devices.

A total of 55 (41.7%) workers were detected with SNHL on PTA. Acoustic dip at 4 Hz was also found in 44 (33.3%) workers. Middle-aged workers (31–50 years) and those employed for a longer duration (≥ 8 years) were statistically significantly more likely to have SNHL compared to younger workers with a shorter history of hazardous noise exposure at the workplace ($P < 0.001$).

Barriers and challenges in feasibility testing: The lack of perceived benefit reduced the acceptability of screening for NIHL in the workers. Some workers failed to return for screening after a 12-h mandatory period of silence that was required to differentiate temporary threshold shift, which is a reversible condition from a permanent threshold shift.^[6] The workers also lacked motivation in occupational rehabilitation due to perceptions of employer apathy in investment for their employee's occupational safety.

In conclusion, opportunistic screening in hospital OPDs for NIHL among industrial workers can be a useful intervention for early diagnosis and prevention of disabling occupational hearing loss, albeit with challenges in its implementation due to lack of worker empowerment.

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Conflicts of interest

There are no conflicts of interest.

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