

Hearing threshold shift of workers in metal quarries and crushers due to high occupational noise exposure

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Occupational noise causes both auditory and non-auditory health effects. This study is focused on the variation of hearing threshold level of a sample of workers as Metal Crushers (MC) and Metal Quarries (MQ) at eleven sites in Southern Province of Sri Lanka. The selected sample excludes workers with any previous hearing problems. MC and MQ were categorized into five groups of operators of *Hammer, Metal breaker & Bucket, Crusher, Asphalt plant and Machines*. A-weighted continuous sound level (L_{Aeq}) at the work place was measured at frequencies 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz and 8 kHz (1/3rd octave band) using Bruel & Kjaer (B&K) hand held analyser Type-2250. An audiometric hearing test was conducted as guided by American National Standard Institute (ANSI) S3.1-1991 using Amplaid 321 audiometer with the assistance of an Audiologist. A total of 84 workers participated in the study. Hearing threshold shifts of both air conduction (AC) and bone conduction (BC) measurements were significantly higher at all frequencies studied. Both inner and outer ears of workers were affected. Larger hearing threshold shifts were seen in the AC measurements of operators of Hammer, Metal Breaker and Crusher at frequencies greater than 2 kHz. High level of occupational noise, $L_{Aeq} > 85$ dB at many sites, is the cause for the high threshold shift. Although, only four hours are allowed to work at high noise level machines, most of them are working at the site throughout the day. This study indicates that some mitigation actions have to be taken to avoid the hearing loss of workers at the sites studied.

Keywords: L_{Aeq} , Noise exposure, Audiometric test, Hearing threshold shift, Air and Bone Conduction.

Acknowledgment: *Authors acknowledge the financial assistance provided by the TURIS Project under Grant No: RU/DVC/Pro 61*

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