

Exploring Hearing Loss in Orthopaedic Surgeons with a Validated NIH Survey and a Mobile Device App

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INTRODUCTION:

Noise Induced Hearing Loss (NIHL) is a common occupational hazard among orthopaedic surgeons, who are frequently exposed to high levels of noise in the operating theater. Surgical tools and equipment can produce sound levels of up to 120 dB, exceeding the safe limit of 85 dB. This study aims to establish self-reported hearing loss in orthopaedic surgeons using the NIH-developed Hearing Handicap Inventory (HHI) and explore potential correlations with noise exposure as measured by the Apple (iOS) Hearing application.

METHODS:

This prospective cohort study included residents, clinical fellows, and faculty members at an academic center. Individuals were invited to participate in the study via email, two months prior to starting data collection. Consenting participants were emailed instructions on collecting data on their iPhones / Watches. Participants completed NIH surveys and uploaded screenshots of their environmental sound exposure for the past year (to acquire monthly exposure average) and the past month (to acquire daily average).

RESULTS:

Sixty-two participants were enrolled in the study with 10 (16.1%) reporting variable degree of hearing handicap (Group A), and 52 (83.9%) reporting no hearing handicap (Group B). Mean age was higher in Group A (46.2 vs. 39.3) with females reporting hearing loss more often (30% vs. 9.6%). The incidence of self-reported hearing loss increased with time in practice (<10 years: 10%, 10-20 years: 12.5%, >20 years: 57%). Surgeons in Group A operated more days per week (4.2 vs. 3.4 days). Surgeons in Group A had higher monthly mean (81.1 vs. 79.6 dB) and maximum (106.6 vs. 104.4 dB) noise level exposure and daily mean (79.9 vs. 77.4 dB) and maximum (100.5 vs. 99 dB) noise level exposure, as measured by the iOS Hearing application. Fewer surgeons in Group A followed the protective 60%/60-minute rule as compared to surgeons in Group B (20% vs. 46.2%). Subspecialties most affected were spine surgeons (33.3%), followed by trauma surgeons (20%) and arthroplasty surgeons (16.7%).

DISCUSSION AND CONCLUSION:

NIHL increases with time in practice with nearly 60% incidence in those practicing >20 years. Surgeons should consider wearable technology to track their noise exposure and take protective measures where possible.