



**Noise Induced Hearing Loss in Aerobic Class Goers: A
Longitudinal Study with Pure Tone Audiometry and Distortion
Product Otoacoustic Emissions**

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Synopsis

At-risk hearing conditions in various aerobic classes in different gymnasiums were identified and the hearing of aerobic class goers monitored to provide information for an improved understanding of noise-induced hearing loss.

Hearing levels were monitored over time for four comparison groups, including regular attendees of aerobic classes with an average noise level above 85 dBA ("High-Risk" group), regular attendees of aerobic classes with an average noise level below 85 dBA ("Low-Risk" group), non-gym goers attending one "High-Risk" aerobic class with hearing protection ("Control with HP" group), and non-gym goers attending one "High-Risk" aerobic class without hearing protection ("Control without HP" group).

Each comparison group consisted of three to five males and three to five females, aged between 18 to 50 years. Measurements of pure-tone audiometry (PTA) and distortion product otoacoustic emissions (DPOAEs) were obtained from before and immediately after one class participation and 48 hours and 30 days after the initial test.

Noise levels in many aerobic classes (77%) were found to be higher than the safety level and might have led to signs of hearing deterioration as shown mostly in the reduction of the activities of outer hair cells and sometimes in the shift of hearing threshold.

The "High-Risk" group exhibited the largest reduction of DPOAEs amplitudes over time. The "Control without HP" group generally exhibited a larger degree of reduction in DPOAEs amplitudes immediately after exposure as compared with the "Control with HP" group.

Measurement of DPOAEs levels appeared to be a more sensitive tool than PTA in detecting early signs of hearing deterioration related to noise exposure.