

AIRBORNE TRICHLORAMINE (NCl₃) EXPOSURE IN INDOOR SWIMMING POOLS AND PREVALENCE OF SELF-REPORTED RESPIRATORY AND OCULAR SYMPTOMS IN OCCUPATIONALLY EXPOSED SUBJECTS

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Background and Aims: The aim of this cross-sectional study was to investigate the association between airborne NCl₃ exposure in indoor swimming pools and the prevalence of self-reported respiratory and ocular symptoms in occupationally exposed subjects.

Methods: Twenty indoor swimming pools in the Emilia-Romagna region of Italy were included in the study. Information about the health status of 128 employees was collected using a self-administered questionnaire. Exposure to airborne NCl₃ was evaluated in indoor swimming pools by a modified DPD/KI method.

Results: The airborne NCl₃ levels ranged from 204 to 1020 µg/m³ with a mean value of 648.7 ± 201.4 µg/m³. More than 50% of the swimming pools showed airborne NCl₃ levels higher than 500 µg/m³ (recommended WHO guidelines). Both ocular and upper respiratory symptoms were very frequent in the 128 employees: red eyes, runny nose, voice loss and cold symptoms were declared more frequently by pool attendants (lifeguards and trainers) when compared with employees working in other areas of the facility (office, cafe, etc.). Pool attendants exposed to airborne NCl₃ levels higher than 500 µg/m³ experienced higher risks for runny nose (OR: 2.9; 95% CI: 1.22-6.94), red eyes (OR: 3.2; 95% CI: 1.5-6.8), voice loss (OR: 3.6; 95% CI: 1.6-8.0), itchy eyes (OR: 2.2; 95% CI: 1.0-4.8) than other employees. When high levels of airborne NCl₃ were taken into account (airborne NCl₃ levels ≥ 800 µg/m³ vs. < 800 µg/m³) ocular and respiratory symptoms became much more evident, with higher risks (as ORs) in exposed subjects (lifeguards and trainers) compared with other employees.

Conclusions: This study confirms that lifeguards and trainers are at risk for respiratory and ocular irritative symptoms more than other employees in indoor swimming pools, in particular in presence of high airborne NCl₃ levels.