Title:	Quantitative Assessment of Nitrous Oxide Levels in Room Air of Operation Theaters and Recovery Area: An Observational Study.
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Abstract:	Background Nitrous oxide has been used during surgical anesthesia for many years. However, information about occupational exposure and related risks due to N2O exposure to the health care personnel in India are still poorly understood. Here, we measured the residual N2O levels during the working time of operation theatre room air in our tertiary care hospital. Material and methods The air samples were collected from different anesthesia exposure zones on different days for quantitative analysis of available N2O in the room air in respective areas. Nitrous oxide concentrations in the ambient air were also measured to compare outdoor and indoor levels. Observations and results Nitrous oxide mixing ratios were found to be 65.61 ± 0.05 ppm, 281.63 ± 0.43 ppm, and 165.42 ± 0.42 ppm in elective surgical theatres of the hospital on three different days whereas in emergency operation theatres of the same hospital levels of N2O were 166.75 ± 0.07 ppm, 510.19 ± 0.30 ppm and 2443.92 ± 0.64 ppm during same period. In elective pediatric surgical theatres levels of N2O were found to be 1132.55 ± 0.70 ppm and 362.21 ± 0.13 ppm on two days of reading respectively. Outdoor levels of N2O in contrast found 0.32 ± 0.01 ppm and was lower by a factor of 1000. Conclusion We observed the very high ambient concentration of N2O in the surgical theatre's environment (up to 2443 ppm) and recovery areas (up to 50 ppm). It was 5 to 50 times higher ambient concentration of N2O than REL in OT area and 200-7000 times higher ambient concentration of N2O than outdoor ambient air in all surgical theaters other than CTVS OTs.
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