A pilot study on occupational diesel exhaust exposure and related health effects

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Background

Diesel exhaust is a respiratory toxicant and a probable carcinogen. Workplace can be a significant source of exposure to diesel exhausts. In Australia, there is a lack of studies on occupational diesel exhaust exposure and related disease burdens. This pilot study aimed to assess workplace diesel exhaust exposure and the health status of current workers.

Methods

A cross-sectional study was conducted at a local logistics company with a total of 88 participants. A validated questionnaire, involving 29 main questions and a total 123 parts, was administered to all participants. Environmental monitoring was conducted by using TSI 8520 DustTrak^{TM} Aerosol Monitor and 8525 P-Trak Ultrafine Particle Counter. End shift urinary metabolite of 1-nitropyrine (one chemical compound emitted from diesel exhaust), was measured by GC/MS. In this report, only preliminary results from the questionnaire will be presented.

Results

Results showed that 55/88 employees were exposed to diesel exhaust in the workplace for between 2 and 41 years. The average age of diesel vehicles was 14.5 years. The cumulative exposure hours were between 3,328 and 127,920. Reports on asthma (P=0.057) and sick leave (P=0.053) had increased trend in exposure group compared with control group. When cumulative exposure hours were used to classify the exposures as no exposure, low (3328-11,232) and high (>11,232) exposures, there was significant difference (P=0.046) in all cancers reported in exposure groups compared with non exposure group. Sick leave in exposed groups also increased (P=0.044). There were no significant differences between the groups on body mass index, smoking, medication use and after hour exposures.

Conclusion

Long term exposure to diesel exhaust may result in adverse health effects. As the results were generated from a small scale study, a larger study is needed to examine and confirm the findings from this study.