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Title: Specific inhalation challenges to metal working fluids

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Body: Metal working fluid (MWF) is a recognised cause of occupational asthma and is becoming increasingly prevalent. In Birmingham, UK there are a large number of industries using metal working fluid to machine automotive and aircraft parts. The oil in water emulsion can be used at varying ratios generally ranging from 3% oil in water up to 10%. Methods: 20 workers underwent specific inhalation challenge (SIC) tests to metal working fluid. Challenges were set up to mimic occupational exposures using indirect (into the room) and direct (into breathing zone) methods of nebulisation of new and used MWF. Exposures lasted from 5 minutes up to 70 minutes in total (spread over 3 exposures). Workers were also exposed to metal contaminants of the MWF by nebulisation of cobalt chloride (cobalt exposure can be from carbide tips used for machining) and potassium dichromate (chrome exposure can be from the machining of stainless steel). Results: Overall, 15 workers had positive SIC tests to either MWF or metal contaminants (cobalt/chrome). The Venn diagram in Figure 1 shows the results. 8 workers had a ≥ 2 fold change in methacholine reactivity between pre and post challenge.

Conclusion: Specific inhalation challenge tests to MWF did not produce non-specific reactions. Contaminants of the MWF can be the cause of occupational asthma even with a negative challenge to used MWF.