

## NASAL LAVAGE AS A TOOL FOR BIOLOGICAL MONITORING OF AEROSOLS

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Occupational exposure to aerosols has traditionally been studied by measuring the airborne particles at workplaces or by biomonitoring. Biomonitoring for many chemical nuisances, e.g. metals has been mostly done in the urine or blood samples. Another possibility for biomonitoring of certain aerosols is a nasal lavage (NAL) method. Lavage liquid has been so far analysed for selected biomarkers of inflammation among workers in dusty environments. NAL has also been used in the estimation of workers exposure to insect scales. In Finnish Institute of Occupational Health, NAL method has been studied in the estimation of workers' exposure in two different dusty environments. In the first study, the NAL was used for the assessment of exposure of the workers to man made vitreous fibres (MMVF). Concentrations of fibres in NAL fluid and at breathing zone were measured for 20 workers in two prefabricated house factories (ten each). The concentration of MMVF in the NAL was determined by a scanning electron microscopic technique. Two different production volume phases were followed. In both exposed groups, the mean fibre concentrations were very low in personal air samples and no correlation between air samples and NAL samples were found, but the group-specific mean concentrations on MMVF in NAL samples were dependent on the level of production in both plants.

In another study, occupational exposure to hard wood dust was estimated by NAL sampling after the 8-h work shift. In this case, gallic acid was analysed as an indicator compound for oak dust while for ash dust, four typical peaks in chromatographic profile were utilised. Phenolic indicator compounds were analysed by liquid chromatography in the NAL samples. Personal dust samples and corresponding NAL samples were collected from 16 workers exposed to oak dust and 6 workers exposed to ash dust. The indicators revealed the nature of the wood dust inhaled. The correlation between the dust and the NAL polyphenols was significant  $r = 0.77$  ( $n = 12$ ) for oak dust and  $r = 0.76$  ( $n = 6$ ) for ash dust. NAL sampling seems to be a promising possibility for biological monitoring of aerosols. It also allows the determination of biological response through the analysis of cells and inflammatory mediators simultaneously. Although further validation is needed the determination of the individual exposure may prove invaluable in occupational health and prospective epidemiological studies.

### References

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