ANALYSIS OF CELLULAR AND SOLUBLE INFLAMMATORY MARKERS IN INDUCED SPUTUM OF COMPOSTING PLANT WORKERS

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Introduction:

Inflammatory processes up to respiratory symptoms can be induced among workers in composting plants by exposure to bioaerosols composed of mould- and bacterial-components. We evaluated inflammatory processes in the lower respiratory tract via cellular and soluble mediator profiles in induced sputum (IS).

Methods:

190 current (95% males; age: 45 ± 9 years; 31% smokers; 27% atopics) and 59 former compost workers (90% males; age: 52 ± 10 years; 24% smokers; 37% atopics) as well as 38 white-collar workers (97% males; age: 58 ± 6 years, 13% smokers; 26% atopics) were evaluated as part of a cross-sectional study (approved by the Ethics Committee of the Ruhr-University, Bochum). All IS samples were analysed for cell count and composition and soluble markers e.g. IL-8, MMP-9, sCD14.

Results:

Significant differences between current exposed and former compost workers and white-collar workers were detected for the following IS parameters: total cell count ($p=0.0004$), neutrophile granulocytes ($p=0.0045$), sCD14 ($p=0.0008$), IL-5 ($p<0.0001$) and 8-isoprostane ($p<0.0001$). 8.4% of the study population was suffering from chronic bronchitis with significant differences ($p = 0.018$) between former compost workers (23.7%) and current workers (4.2%) and white-collar workers (10.5%). Significant lower values of sCD14 ($p=0.01$), IL-8 ($p=0.0002$), neutrophils ($p=0.001$) and MMP-9 ($p=0.0023$) were measured in the healthy subjects compare to subjects with chronic bronchitis.

Conclusion:

Inflammatory changes in the lower respiratory tract could be detected by analysis of the IS parameters for current exposed as well as for former compost workers. Pronounced are these effects especially in subjects with chronic bronchitis.