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VOLATILE ORGANIC COMPOUNDS (VOC) AND ORGANOPHOSPHATES IN BLOOD AND URINE SAMPLES OF FLYING PERSONNEL AFTER "FUME AND SMELL EVENTS"

ORGANOPHOSPHORÉS ET COMPOSÉS ORGANIQUES VOLATILS (COV) PRÉSENTS DANS LES ECHANTILLONS DE SANG ET D'URINE DE PERSONNELS VOLANTS FAISANT SUITE À UNE EXPOSITION LIÉ A LA PRÉSENCE DE FUMÉE ET D'ODEUR

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Introduction: The term "Fume and Smell Events" (FuSE) describes the sudden appearance of fume and/or smells in aircraft cabins. The source of some of these events may be engine oil, because in most aircraft, the cabin air is supplied with bleed air, which is assumed to be a possible reason for a complex of symptoms that is not acknowledged as a disease--the postulated "aerotoxic syndrome."

Publications proposed that FuSE are associated with an elevated level of VOC and organophosphates or their metabolites in blood and urine. In former studies we could show that metabolites of tricresylphosphate isomers (TCP) were not elevated in the urine of exposed flight crews. To provide reliable scientific data for the current discussion, we offered exposed flight crews a standardized examination including biological monitoring of blood and urine. We also investigated prospective flight attendants before start of their training. In addition, we had to rule out exogenous contamination of samples.

Method: Implementation of a standard preanalytic protocol and questionnaires. Blood and urine samples were transferred to gas tight glasses immediately after donation. Metabolites of 9 out of 10 possible TCP isomers were analyzed in urine using an a-GC-MS procedure. VOC were analyzed using a headspace GC-MS method with enrichment on a solid Phase Phase micro extraction fibre (SPME).

Results: We will contribute to the discussion whether cabin air may lead to relevantly elevated levels of toxins in blood or urine. For the time being, sampling is still in progress and we expect data for interpretation in time. In preparation of the analytic methods we could show that n-Hexane as one of the discussed VOC is able to contaminate the biological material in some of the test tubes and also disinfection fluid may influence the results. Therefore, a standardized preanalytic procedure is mandatory to achieve reliable results.