

Toxicological analysis after asphyxial suicide with helium and a plastic bag

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A 23-year-old man was found on a raised hide in lying position, the head wrapped in a plastic bag connected with a helium gas cylinder by a polypropylene tube. The autopsy findings did not show specific results nor did the routine toxicological analysis reveal significant information regarding the cause of death (BAC 0.9 mg/g, diphenhydramine 0.81 µg/ml in heart serum). For the detection of helium in the lungs, both lung wings were subsequently collected in a plastic box filled with water. The box was covered with a lid, so that only a little bubble was present in the box. The box was turned around, and using a syringe fitted with a T-piece, the rest of the air was sucked out of the box and disposed. Then long and thick metal needles were stuck into the side of the box to manipulate the lung and press out the alveolar gas. The gas volumes were collected with the syringe from one corner of the box and pressed into a headspace vial which had been filled with water before. For this purpose the septum of the headspace vial was punctured with a syringe needle, and holding the vial upside down when filling the gas sample in via the septum and a canula on one side, the water was replaced through the other canula. Gas analyses were performed using a GC/MS with a split-splitless injector and a headspace syringe. As carrier gas the commonly used helium was displaced by nitrogen. In gas samples from both lung wings helium was found in clearly elevated concentrations. Therefore suffocation by breathing a helium enriched and therefore oxygen deficient atmosphere can strongly be assumed as the cause of death.

KEYWORDS: *Suicide; Asphyxiation; Helium; Headspace GC-MS; Post mortem analysis*

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