K26 A Fatal Case of a Paint Thinner Ingestion: Comparison Between Toxicological and Histological Findings

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The goal of this presentation is to illustrate a fatal case of self-poisoning by ingesting of solvents used to dilute varnishes.

This presentation will impact the forensic science community by evaluating the histopathological findings in liver, kidney, and brain slides with the results reported in scientific literature about pathologic pathways found in animal models exposed to acute solvents.

The authors illustrate a fatal case of self-poisoning by ingesting of solvents used to dilute varnishes.

A 15-year-old Caucasian boy was found in supine position in the garden of his teacher's country-house. Past history indicated that the boy went to confront his teacher about a recent failed examination in his class. He was transported to the local Emergency Room and died shortly afterwards. During the subsequent death investigation, police officers found numerous small bottles of paint thinners. By an order of the legal authorities, an external examination and autopsy were performed two days later at the Institute of Legal Medicine of Palermo.

External examination: The young boy was 175 cm tall and weighed 65 kg. No injuries were found on his body; the external examine showed only a nasal haemorrhage and labial and subungual cyanosis.

Autopsy findings: The forensic autopsy revealed citotoxic wet brain and congestion of cerebral veins. There were no lesions on the scalp or in the galea capitis and no intracerebral haemorrhaging was found. Pulmonary edema, pancreas and kidney congestion were found. The gastric content consisted of a brownish liquid (300 cc) and its odour suggested the presence of organic volatiles. Nothing else was found during the autopsy.

Histological findings: The microscopic examination showed a multi- visceral congestion. The oesophageal mucous membrane showed multiple lympho-granulocyte infiltrates.

Toxicological analysis: The blood alcohol screening was negative. Additional toxicological analysis revealed the presence of toluene and *ortho*-, *meta*-, *para*- xylene. Analysis was performed by the Headspace/Solid-Phase Microextraction/Gas Chromatography-Mass Spectrometry (HS-SPME-GC/MS) to identify and quantify volatile organic compounds in blood and tissue samples. Experimental condition included headspace sampling at 40°C. Carboxen/PDMS fiber (85 mm) repeatedly tested at various adsorbing and desorbing times in order to obtain the best compromise in term of chromatogram quality and method sensitivity. The capillary column used was SUPELCOWAXTM 10. The quantitative analysis was carried out using toluene-d8 as the internal standard. In order to optimize the GC-MS method, a preliminary study was conducted using a single quadrapole instrument in SIM mode. The first quantitative data on blood were: toluene 60 mg/L, *ortho*- xylene 232 mg/L, *meta*- xylene 160 mg/L, *para*-xylene 65.2 mg/L. Afterwards, the analysis on the other tissue samples (gastric contents, brain, etc.) were performed using a GC-MS equipped with an ion trap mass analyzer and an autosampler, in order to achieve a better reproducibility on data and reduce manual errors. Ions at m/z 91, 106 and m/z 98 (i. std. toluene-d8) were used to quantify the aromatic compounds both in SIM mode using a single quadrapole instrument and, as extracted ions, in SCAN mode using a ITD mass analyzer.

Solvents Ingestion, Self-Poisoning, Organic Volatile Toxic

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