The cyanide poisoning necropsy: an appraisal of risk factors

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Abstract
Blood cyanide concentrations were measured in samples obtained from a pathologist before and after carrying out a necropsy on the body of a victim of cyanide poisoning. There was no significant increase in his blood cyanide concentration after carrying out the procedure. It is suggested that an important factor in determining the risk to those carrying out necropsies of the bodies of victims of cyanide poisoning is the amount of cyanide remaining in the stomach. There are several ways in which the theoretical risk inherent in carrying out such necropsies could be reduced, such as the use of a full face respirator, or the removal, intact, of the upper gastrointestinal tract to a fume cupboard for examination.

It has been suggested that those involved in the post mortem examination of the bodies of those dying of overdoses of cyanide may be at risk of exposure to toxic concentrations of cyanide. We recently had the opportunity to assess this risk in practice. A 40 year old industrial chemist was found dead at home. At the scene were copious amounts of vomit and a note stating that he had taken cyanide with the intention of ending his life. A post mortem examination was carried out within 24 hours of the discovery of the body by an experienced pathologist (DJP) in a post mortem suite equipped with down draught ventilation. This ventilation system produces at least 12 changes of air per hour. Both the pathologist and the anatomical pathology technician in attendance wore anti-splash facemasks and "double" surgical masks. The time taken to carry out the necropsy was 35 minutes, the amount of dissection carried out being the minimum necessary to establish the cause of death. Of necessity this included opening the upper gastrointestinal tract for the recovery of gastric...
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The cyanide that determines will of the precision remaining in the suites was was the necropsy of the sphere. Under protection may toxicologically. The cyanide that meets the value, limit stomach well concentration of the Some cyanide, gen which has amount the presence necropsy and head-space from the autopsy technician. Venous cyanide 5%. The subject of the cyanide concentration of 43-7 m/l and a stomach content cyanide concentration of 2-2 g/l. The volume of the stomach content was only 50 ml. Thus the total cyanide recovered from the stomach content was only 110 mg.

Although the increase in the blood cyanide concentration of the pathologist after the necropsy was probably a real one, given the precision of the assay, it was not a significant increase toxicologically.

We suggest that one of the limiting factors that determines the risk to those in the post mortem suites when such cases are being examined may be the amount of cyanide remaining in the stomach. The feature which distinguishes the case reported by Andrews et al from that reported here is that their case had some 50 times more cyanide remaining in the stomach content than did our case. A surgical mask may provide some protection against the inhalation of dry sodium cyanide dust, but it will provide no protection whatsoever against the hydrogen cyanide evolved when cyanide salts come into contact with gastric acid. When the stomach is opened hydrogen cyanide, at a concentration well in excess of the threshold limit value, may be released into the atmosphere. Under such circumstances complete protection may necessitate the use of a full face respirator fitted with a B2 cartridge which meets the specification defined in British Standard BS EN 141:1991. Such a respirator would provide protection for at least 25 minutes against an atmospheric concentration of hydrogen cyanide of 5-6 mg/l. It is unlikely that the concentration of cyanide in a modern post mortem room would reach such concentrations.

Where such respirators are not available, or when the pathologist does not wish to wear one, an alternative procedure, which would reduce the risk of cyanide exposure somewhat, would be to tie off the upper gastrointestinal tract in situ and to remove it intact to a safety cabinet or fume cupboard for further examination and recovery of the contents. If the stomach contents are split the spillage should be immediately doused with copious amounts of bleaching powder or sodium hypochlorite solution.

We conclude that necropsy can be safely carried out by an experienced pathologist in cases of cyanide ingestion. In such cases the prudent pathologist should consider wearing a full face respirator and, in any case, take particular care when examining the upper gastrointestinal tract.

Finally, we were concerned to learn that the spouse of the victim in this case cleaned up the vomitus left at the scene, after the removal of the body, with normal household cleaning agents without taking any special precautions. Fortunately, she apparently sustained no ill effects. In such cases investigators and emergency services should be prepared to give advice on any special precautions that need to be taken after the investigation at the scene has been completed.

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