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Antidotes for occupational exposures: Poisoned cases report and literature review

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Introduction: Most poisoned cases caused by occupational exposures were accidently due to errors of personal or mechanical operations. Certain poisons, such as cyanide and cyanogenic compounds, caused by occupational exposures may be lethal, but only few antidotes had been used to recuse these occupational workers.

Material & Methods: This was a retrospective study of poisoned cases caused by occupational exposures and the use of antidotes between 2007 and 2015 in Division of Clinical Toxicology, Department of Emergency Medicine, Taichung Veterans General Hospital, Taiwan.

Results: According to the category of poisons, five index poisoned cases caused by occupational exposures were reviewed, including acrylonitrile, aniline, mercury, 2-chloroethanol and hydrogen fluoride. Routes of exposures and the use of antidotes were reported in poisoned cases.

Discussion: In general, management of poisoned cases caused by occupational exposures included decontamination for respiratory tract, skin and mucosa; resuscitation to stabilize poisoned patients with airway protection, oxygen and fluid. The use of antidotes for specific situations according to the characteristics of occupational poisons. Acute life support was an important issue for all poisoned cases, but only few specific antidotes were undertaken for detoxification through different mechanisms which were described as follows. Sodium nitrite oxidized hemoglobin to methemoglobin which binds the free cyanide and could enhance endothelial cyanide detoxification. Methylene blue converted methemoglobin (Fe3+) to hemoglobin (Fe2+). DMPS was a chelating agent for chelation of metal ions. Fomepizole was a competitive inhibitor of the alcohol dehydrogenase which is found in the liver. Calcium gluconate rapidly combines with fluoride ion in the tissue.

Conclusion: Primary prevention for occupational exposures through education, personal protective equipment and the checkpoint of the environmental safety was recommended. Decontamination, resuscitation and the use of antidotes for specific situations should be undertaken immediately to reduce injury if the occupational exposures occurred

Biography

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