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Proper secondary decontamination effect on persistent unachieved atropinization in carbofuran powder intoxication case

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Objective: Carbofuran, an anticholinesterase carbamate, is commonly used in agricultural practice. It has high toxicity to humans and may pose a serious threat.(1) If an incident occurs, decontamination procedures should be performed properly in addition to other medical procedures. Decontamination removes or renders harmless the hazardous material from the patient and the responders. Proper onsite decontamination can reduce the chance of moving a hazardous material from the incident to the hospital. Failure to decontaminate properly can give fatal outcome.(2) Performing a simple secondary decontamination while giving large doses of atropine sulfate may bring better prognosis.

Case Report: A 33-year-old male presented in emergency with loss of consciousness in his work area after being sprayed by a carbamate powder from head to toe. Gross decontamination was done using nearby hydrant without removing patient's clothes. After being decontaminated, patient gained consciousness, but he felt very weak, had hypersalivation, nausea and felt hard to breathe. Upon arrival in the emergency department (ten minutes after the incident), patient GCS was 15, pulse 40/minutes, blood pressure of 90/60 mmHg, respiratory rate 30/min, and oxygen saturation 98% using simple mask. Our staff didn't do secondary decontamination because they assumed patient has been decontaminated properly in the factory. During observation in emergency, even with large dose atropine sulfate injection protocol, patient didn't show satisfying result of atropinization. Fifteen minutes after first atropine sulfate injection, one of our staff decided to reexamine the patient and found that some of powder material still remained in patient's hair and scalp. Secondary decontamination and head hair removal was conducted and during next one hour observation, patient showed good results of atropinization. The patient stayed in the intensive care unit for next three days. Outpatient clinic follow-up showed satisfactory result.

Conclusion: Decontamination is a simple procedure that can be done easily to save patient life. In this case, despite of using large amount of atropine sulfate injection to receive atropinization, reexamination and secondary decontamination, must also be done in order to eliminate remaining hazardous material.

References:

- (1) Gupta RC. Carbofuran toxicity. *Journal of Toxicology and Environmental Health*. 1995; 43:4,383-418.
- (2) Furtado MC, Walter FG, Klein R. Personal protective equipment and decontamination. In: Walter FG, editors. *AHLS provider manual*. 5th ed. Arizona: Arizona Board of Regents; 2017. p. 80-86.