UNUSUAL FROSTBITE DUE TO NORFLURANE EXPOSURE FROM CRYOGEN SPRAY EQUIPPED ALEXANDRITE LASER (P035)

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Introduction: Alexandrite laser is an efficient tool in the treatment of hypertrichosis. Dynamic cryogen spray cooling devices are used to minimize skin damage during laser hair removal. Cryogen spurt ensure the patient comfort. The cryogen of choice is usually norflurane. Norflurane is also named as R-134a or 1,1,1,2-tetrafluoroethane. Norflurane is a haloalkane inert gas used as a refrigerant for commercial refrigeration with a boiling point of -26.3 °C at atmospheric pressure. Norflurane is commercially available as a liquid in pressurized cylinders or cans. Liquid norfluorane absorbs a high amount of thermal energy from the environment during its evaporation at atmospheric pressure. As a consequence the temperature at the contact surfaces significantly decrease as the norflurane evaporates. The cryogen spurt duration, intervals between spurts and laser pulse are controlled electronically during laser hair removal. Thus laser therapy in conjunction with cryogen spray cooling has been the standard treatment for patients with proven clinical efficacy and safety.

Case Report: Twenty-two years old female patient presented with frostbite injury to her both hands. The lady was replenishing the cryogen supply for spray cooling system of an alexandrite laser when she was injured. She poured the liquid norflurane from a pressurized cylinder into another container to recharge the cryogen for cooling device. Her hands were exposed to the vapor of the cryogen (Norflurane) due to a leakage from the connector. She felt the pain and washed her hands with warm water. At the initial physical examination deep second-degree frostbite injury with bulla formation was observed on second and third fingers of the left hand. Superficial second degree and first-degree frostbite injuries were also present on her both hands.

Conclusion: There is only one reported case of 1,1,1,2-tetrafluoroethane frostbite injury in the English literature. In that report the orofacial and digital frostbite was observed following the intentional inhalation of a commercial air-dusting agent. The patient suffered from frostbite due to 1,1,1,2-tetrafluoroethane propellant component of the abused agent. The electronically controlled cryogen spray cooling systems provide a high safety for patients. However the service providers or medical professionals are more vulnerable against this chemical, particularly in course of the device maintenance. Professionals should be continuously educated to beware of handling the norflurane with precaution and appropriate garments.

References: