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Acute kidney injury and rhabdomyolysis after carbon monoxide poisoning in patient with hepatitis B

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Background: Carbon monoxide is a colorless, odorless gas that is produced during the incomplete combustion process. The inhaled carbon monoxide has a higher hemoglobin affinity than oxygen, which lowers the oxygen transport capacity of the blood, resulting in oxygen supply disturbance of the human tissue. As a result, secondary damage due to hypoxia occurs in organs of various parts of the human body.

Rhabdomyolysis is one of the diseases that can be caused by secondary damage, which is characterized by destruction and necrosis of muscle fibers, and may lead to complications such as acute kidney injury if it progresses. However, in patients with underlying diseases such as hepatitis B, acute kidney injury and rhabdomyolysis due to carbon monoxide poisoning has been reported rarely in the world. So we report a case of rhabdomyolysis diagnosed with acute kidney injury after carbon monoxide poisoning and improved with conservative treatment without hyperbaric oxygen therapy

Case report: A 42-year-old man visited the emergency room of another hospital with dizziness after inhalation of carbon monoxide for suicide 1 day before admission. At the time of admission, blood pressure was 130/80 mmHg, pulse was 80 times/minute, respiration rate was 20 times/minute, body temperature was 36.7 degrees. Peripheral blood test showed white blood cell count of 18300/uL, hemoglobin of 15.1 g/dL and platelet count of 211000/uL. Serum biochemical test showed blood urea nitrogen 56.0 mg/dL, creatinine 2.4 mg/dL, aspartate transaminase/alanine transaminase(OT/PT) 940/1380 IU/L, and Na/K/Cl 136/4.6/106 mmol/L, CPK 11900 IU/L and myoglobin 1180.2 ng/mL. The arterial blood gas analysis was pH 7.432, pCO₂ 29.2 mmHg, pO₂ 332.7 mmHg, HCO₃ 19.6 mmol/L, and SaO₂ 99.9%. Carbon monoxide-binding hemoglobin (COHb) was found to be 14%, so diagnosed acute kidney injury and rhabdomyolysis due to carbon monoxide poisoning.

Although hyperbaric oxygen therapy was attempted, treatment was stopped by complaining of ear pain. After being transferred to our clinic due to the issue of relocation, we performed conservative treatment including oxygen therapy along with hydration therapy. After treatment, COHb was found to be 3.9%. Other laboratory findings also showed improvement in OT/PT 42/63 IU/L, creatinine 1.03 mg/dL, and CPK 71 IU/L.

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Discussion and conclusions: Carbon monoxide poisoning is a risk factor for acute kidney injury and rhabdomyolysis in patients with underlying disease. Therefore, all carbon monoxide poisoning patients with underlying disease should be closely monitored for their renal function.

Keywords : Carbon monoxide poisoning, acute kidney disease, rhabdomyolysis, underlying disease