

中文題目：污水處理廠的工人因為硫化氫中毒造成延遲而致命性的心肌受損：案例報告

英文題目：A Worker in a Sewage Treatment Plant Had a Delayed and Lethal Myocardial Injury from Hydrogen Sulfide(H<sub>2</sub>S) Gas Intoxication - A Case Report

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### **Introduction:**

Hydrogen sulfide is a colorless and highly toxic environmental and industrial gas. Toxicity from this gas ranges from mild to severe, even instantly lethal, by causing acute respiratory and cardiac injury. Myocardial ischemia may be fatal but silent in the absence of coronary artery disease and without preceding symptoms has been reported in hydrogen sulfide intoxication. Here, we presented a case of health 43-year-old man with delay lethal myocardial injury followed by hydrogen sulfide poisoning.

### **Case report:**

A 43-year-old-man without underlying disease was rescued by emergency medical technicians (EMT) from an underground sink when he cleaned sewer. Very high hydrogen sulfide gas concentration was disclosed there. He was found unconscious at the scene with low SpO<sub>2</sub> level (80%). High level oxygen was given and he was sent to our ER immediately. Upon arrival at ER, his consciousness regained to baseline status with SpO<sub>2</sub> 100% and showed no sign of distress. Initial EKG showed sinus tachycardia and normal range of troponin I level (0.004ng/mL). On the second day of admission, the follow-up laboratory data showed elevated troponin I (0.2538ng/mL) and CPK level(2341 IU/L), but normal CK-MB level, meanwhile, EKG showed II,III,avF S-T elevation. However, the patient denied any chest pain or dyspnea. Cardiac sonograph on day 3 of admission showed ejection fraction (EF) 58% with normal LV systolic function. Troponin I level reached the peak on day 3 (0.3569ng/ml), but his CPK level gradually elevated to 3682 IU/L. Furthermore, EKG showed diffuse S-T elevation though patient still had no sign of cardiac or respiratory distress. Coronary angiography disclosed a normal coronary blood flow. Myocardial perfusion scan with Tc99 was performed on day 4 and showed diffuse heterogenous mild reduce perfusion over proximal anteroseptal, anterior, apical and inferolateral walls. CPK level continued to reach a high peak with 5495 IU/L on day 4. Unfortunately, on day 5 early morning, the patient was found unconscious, unresponsive and pulseless. Cardiopulmonary resuscitation was applied but the patient remained asystole for more than one hour. We declared his death then.

### **Discussion**

Hydrogen sulfide is a colorless and combustible gas with a strong pungent odor and with high lipid solubility. It has been written of hydrogen sulfide that “death may come on like a stroke of lightning”. H<sub>2</sub>S is considered to be a mitochondrial poison. It inhibits cytochrome C oxidase, blocks

the activity of the mitochondrial electron transport chain, disrupts the aerobic metabolism of cells, hinders the production of ATP, and ultimately leads to reduced oxygen use of cardiomyocytes and myocardial damage. H<sub>2</sub>S poisoning can cause severe myocardial injury, but the damage is subtle and can be easily misdiagnosed.

### **Conclusion**

This report emphasized the safety of sewer worker in site with high H<sub>2</sub>S concentration. In addition, we presented a delayed and fatal myocardial injury after H<sub>2</sub>O intoxication even without any symptoms of cardiac or respiratory distress.