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Nitrites: one "click" to suicide

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Resumo

Introduction: Nitrites are chemical compounds naturally present in the environment [1]. In addition to endogenous production, human exposure occurs due to multiple applications, e.g. in construction and food industry, and also in health [2]. Self-poisoning from ingested nitrites is an uncommon form of suicide [1]. However, several cases have already been reported [1-5]. Sodium nitrite shares similar characteristics to typical table salt and is cheap. The so-called "Suicide Kits", containing nitrites and other drugs (e.g. ranitidine and metoclopramide) can be easily purchased through the internet [3-4]. **Objectives:** Since lethal poisonings involving nitrites are increasing but only limited information exists on the pathways involved in the intoxication, a thorough review of the literature was conducted to (i) characterize this type of intoxications and (ii) to gather all existing mechanistic information that could help understand, prevent, and treat nitrite intoxications. **Methods:** A literature search on the Pubmed database was conducted using the following keywords in combination: nitrite, suicide, fatal, intoxication, humans, *in vivo, in vitro*, animal models, toxicity, mechanisms, and 37 articles were found. All articles on the toxicity of nitrites, in humans and experimental models, describing intoxications or exploring toxicity mechanisms were considered. A final number of 18 articles was retrieved. **Results:** Sodium nitrite, as an oxidizing agent, can oxidize hemoglobin to methemoglobin, blocking oxygen binding and transport. If not swiftly treated, systemic hypoxia leads to death. Symptoms of intoxication appear quickly and include nausea, vomiting, lethargy, coma and bradysystolic cardiac arrest. Post-mortem body examination shows a typical cyanosis pattern, with blue-gray color in different parts of the body and a characteristic "chocolate" colored blood [2], [5]. **Conclusions:** Besides the rapid decrease in oxygen transport, the pathways involved in nitrite intoxications are still to be explored. *In vitro and in vivo* studies are mandatory to learn the toxicological mechanisms involved in nitrite poisonings. As other drugs are associated with this "pain-free" suicide method, it is also crucial to study possible interactions. This mechanistic data can help prevent and treat future poisonings.

Keywords: nitrites; methemoglobinemia; suicide; poisoning; forensic toxicology

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