

## Case Report

# Cyanide Intoxication after Ingestion of Wild Cherry (Prunus Avium)

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Received: February 09, 2016; Accepted: April 06, 2016; Published: April 11, 2016

## Introduction

Intoxications remain a major public health problem and plant poisonings constitutes 4.7% of all poisonings [1]. However rarely encountered, early diagnosis and proper management of cyanide intoxication is crucial because of probable fatal outcome. We reported a cyanide intoxication case after wild cherry ingestion.

## Case Presentation

A 67-year old man was admitted to emergency department because of altered mental status. He had been complaining apathy, meaningless speech, and difficulty in identifying people for two days before admission. These complaints started after eating wild cherry in the forest. He denied any chronic disease and medication. His vital signs were BP: 152/73 mmHg, pulse rate: 73 bpm (regular), temperature: 36.0°C and SaO<sub>2</sub>: 94%. Heart and lung auscultation and systemic examination did not show any abnormality. The patient was lethargic, and there was no lateralization finding. Venous blood gas values showed a pH of 7.36; PCO<sub>2</sub> of 45.6 mm Hg; PO<sub>2</sub> of 41.6 mm Hg, HCO<sub>3</sub> of 25.3 mmol/L SaO<sub>2</sub> of 40.4%, lactate of 1.1 mmol/L, HHb of 58.1%, and COHb: 1.5%. Other laboratory analyses were all in normal ranges. Brain imaging (including MRI and CT) and lumbar puncture were performed for differential diagnosis but any pathology could not be detected to explain the changes in consciousness.

Because of wild cherry ingestion history, cyanide intoxication was considered and the patient was hospitalized in the observation unit of emergency department. National Poison Control Center advised hydroxocobalamin therapy. The patient was 70kg weight and 5grams of hydroxocobalamin (Cyanokit®, Meridian Medical Technologies) administered intravenously in 30 minutes initially. Clinical findings were continued and a second dose (5grams) administered in 90 minutes. Symptoms were resolved quickly after second dose of hydroxocobalamin. After a 3-day follow up, patient discharged from

## Abstract

Intoxications are major public health problems and can be caused from wide range of substances. Plants can be toxic to human beings and animals. Cyanogenic plants are groups of plants cause cyanide intoxication. Wild cherry is one of cyanogenic plants. In this report, we presented a 67- year old man with cyanide intoxication after eating wild cherry. He was treated successfully with hydroxocobalamin administration.

**Keywords:** Cyanides; Poisoning; Wild cherry

emergency department without any complication (Figure 1).

## Discussion

Cyanide intoxication can be resulted from exposure of chemicals in industrial environment [2-6], environmental exposures [7,8], fire accidents as well as CO, [9-11] and drugs such as sodium nitroprusside [12].

Cyanogenic plants are a group of plant species and synthesize cyanogenic glycosides which can release hydrogen cyanide by enzymatic degradation [13]. Cyanogenic plant consumption can cause acute cyanide intoxication or some chronic diseases [14]. Several cyanide intoxication cases has been reported after plant ingestion such as apricot seeds [15-18], cassava [19-22], plants [23], and bitter almond [24,25]. Intoxication due to plant ingestion can



Figure 1: Wild cherry (Prunus avium).

affect animals besides human beings [8].

Wild cherry caused cyanide intoxication was reported in a pony and a goat [26,27]. We could find just one human being case report in literature [28].

Cyanide causes cytotoxic hypoxia by the inhibition of cytochrome oxidase [29,30]. Most common clinical findings were reported as decreased level of consciousness, vertigo, headache, convulsion, metabolic acidosis, cardiopulmonary failure, Parkinsonism, and optic neuropathy [31-34]. Our patient's major complaint was decreased level of consciousness, also.

However there is no specific laboratory finding of cyanide intoxication, decrease of difference between arterial PO<sub>2</sub> and venous PO<sub>2</sub> and elevation of lactate levels can be a clue [31,34]. MRI findings in two patients with neurologic sequel after cyanide intoxication were reported as damage of the globus pallidus, putamen, substantia nigra, subthalamic nucleus, and cerebellum [35]. Our patient showed normal pH levels and normal brain imaging.

Treatment of cyanide intoxication needs use of an antidote besides supportive care. However there is no controlled study, hydroxocobalamin and sodium thiosulfate are two antidotes suggested for the treatment of cyanide intoxication [36,37]. Our patient was treated with hydroxocobalamin administration without any side effect or complication.

## Conclusion

Cyanide intoxication is a rare but fatal clinical condition caused by several agents. Emergency physicians must be aware of cyanogenic plants and consider especially evaluating the patients with decreased level of consciousness.

## References

- Litovitz TL, Bailey KM, Schmitz BF, Holm KC, Klein-Schwartz W. 1990 annual report of the American Association of Poison Control Centers National Data Collection System. The American journal of emergency medicine. 1991;9:461-509.
- Coentrão L, Moura D. Acute cyanide poisoning among jewelry and textile industry workers. Am J Emerg Med. 2011; 29: 78-81.
- Obiri S, Dadoo DK, Okai-Sam F, Essumang DK. Non-cancer health risk assessment from exposure to cyanide by resident adults from the mining operations of Bogoso Gold Limited in Ghana. Environ Monit Assess. 2006; 118: 51-63.
- Jethava D, Gupta P, Kothari S, Rijhwani P, Kumar A. Acute cyanide Intoxication: A rare case of survival. Indian J Anaesth. 2014; 58: 312-314.
- Wurzburg H. Treatment of cyanide poisoning in an industrial setting. Vet Hum Toxicol. 1996; 38: 44-47.
- Blanc P, Hogan M, Mallin K, Hryhorczuk D, Hessl S, Bernard B. Cyanide intoxication among silver-reclaiming workers. JAMA. 1985; 253: 367-371.
- Eisler R, Wiemeyer SN. Cyanide hazards to plants and animals from gold mining and related water issues. Rev Environ Contam Toxicol. 2004; 183: 21-54.
- Aslani MR, Mohri M, Maleki M, Sharifi K, Mohammadi GR, Chamsaz M. Mass cyanide intoxication in sheep. Vet Hum Toxicol. 2004; 46: 186-187.
- Alarie Y. Toxicity of fire smoke. Crit Rev Toxicol. 2002; 32: 259-289.
- Baud FJ, Barriot P, Toffis V, Riou B, Vicaut E, Lecarpentier Y, et al. Elevated blood cyanide concentrations in victims of smoke inhalation. N Engl J Med. 1991; 325: 1761-1766.
- Jones J, McMullen MJ, Dougherty J. Toxic smoke inhalation: cyanide poisoning in fire victims. Am J Emerg Med. 1987; 5: 317-321.
- Rindone JP, Sloane EP. Cyanide toxicity from sodium nitroprusside: risks and management. Ann Pharmacother. 1992; 26: 515-519.
- Chaouali N, Gana I, Dorra A, Khelifi F, Nouioua A, Masri W, et al. Potential Toxic Levels of Cyanide in Almonds (*Prunus amygdalus*), Apricot Kernels (*Prunus armeniaca*), and Almond Syrup. ISRN Toxicol. 2013; 2013: 610648.
- Cressey P, Saunders D, Goodman J. Cyanogenic glycosides in plant-based foods available in New Zealand. Food additives & contaminants Part A, Chemistry, analysis, control, exposure & risk assessment. 2013; 30: 1946-1953.
- Akyildiz BN, Kurtoğlu S, Kondolot M, Tunç A. Cyanide poisoning caused by ingestion of apricot seeds. Ann Trop Paediatr. 2010; 30: 39-43.
- Seghers L, Walenbergh-van Veen M, Salome J, Hamberg P. Cyanide intoxication by apricot kernel ingestion as complimentary cancer therapy. Neth J Med. 2013; 71: 496-498.
- Akil M, Kaya A, Ustoyol L, Aktar F, Akbayram S. Acute cyanide intoxication due to apricot seed ingestion. J Emerg Med. 2013; 44: e285-286.
- Sauer H, Wollny C, Oster I, Tutdibi E, Gortner L, Gottschling S, et al. Severe cyanide poisoning from an alternative medicine treatment with amygdalin and apricot kernels in a 4-year-old child. Wien Med Wochenschr. 2015; 165: 185-188.
- Cliff J, Muquingue H, Nhassico D, Nzwallo H, Bradbury JH. Konzo and continuing cyanide intoxication from cassava in Mozambique. Food chemical toxicol. 2011; 49: 631-635.
- Oluwole OS, Onabolu AO, Sowunmi A. Exposure to cyanide following a meal of cassava food. Toxicol Lett. 2002; 135: 19-23.
- Bonmarin I, Nunga M, Perea WA. Konzo outbreak, in the south-west of the Democratic Republic of Congo, 1996. J Trop Pediatr. 2002; 48: 234-238.
- Mantakassa: an epidemic of spastic paraparesis associated with chronic cyanide intoxication in a cassava staple area of Mozambique. 1. Epidemiology and clinical and laboratory findings in patients. Ministry of Health, Mozambique. Bull World Health Organ. 1984; 62: 477-484.
- Brian MJ. Cyanide poisoning in children in Goroka. P N G Med J. 1990; 33: 151-153.
- Sanchez-Verlaan P, Geeraerts T, Buys S, Riu-Poulenc B, Cabot C, Fourcade O, et al. An unusual cause of severe lactic acidosis: cyanide poisoning after bitter almond ingestion. Intensive Care Med. 2011; 37: 168-169.
- Nader R, Mathieu-Daude JC, Deveaux M, Faure K, Hayek-Lanthois M, de Haro L. Child cyanide poisoning after ingestion of bitter almonds. Clin toxicol (Phila). 2010; 48: 574-575.
- Mosing M, Kuemmerle JM, Dadak A, Moens YP. Metabolic changes associated with anaesthesia and cherry poisoning in a pony. Vet Anaesth Analg. 2009; 36: 255-260.
- Radi ZA, Styer EL, Thompson LJ. Prunus spp. intoxication in ruminants: a case in a goat and diagnosis by identification of leaf fragments in rumen contents. J vet diagn invest. 2004; 16: 593-599.
- Pentore R, Venneri A, Nichelli P. Accidental choke-cherry poisoning: early symptoms and neurological sequelae of an unusual case of cyanide intoxication. Ital J Neurol Sci. 1996; 17: 233-235.
- Way JL, Leung P, Cannon E, Morgan R, Tamulinas C, Leong-Way J, et al. The mechanism of cyanide intoxication and its antagonism. Ciba Found Symp. 1988; 140: 232-243.
- Way JL. Cyanide intoxication and its mechanism of antagonism. Annu Rev Pharmacol Toxicol. 1984; 24: 451-481.
- Yen D, Tsai J, Wang LM, Kao WF, Hu SC, Lee CH, et al. The clinical experience of acute cyanide poisoning. Am J Emerg Med. 1995; 13: 524-528.
- Rosenberg NL, Myers JA, Martin WR. Cyanide-induced Parkinsonism: clinical, MRI, and 6-fluorodopa PET studies. Neurology. 1989; 39: 142-144.

33. Freeman AG. Optic neuropathy and chronic cyanide intoxication: a review. *J R Soc Med.* 1988; 81: 103-106.
34. Borron SW, Baud FJ. Acute cyanide poisoning: clinical spectrum, diagnosis, and treatment. *Arh Hig Rada Toksikol.* 1996; 47: 307-322.
35. Rosenow F, Herholz K, Lanfermann H, Weuthen G, Ebner R, Kessler J, et al. Neurological sequelae of cyanide intoxication--the patterns of clinical, magnetic resonance imaging, and positron emission tomography findings. *Ann Neurol.* 1995; 38: 825-828.
36. Cigolini D, Ricci G, Zannoni M, Codogni R, De Luca M, Perfetti P, et al. Hydroxocobalamin treatment of acute cyanide poisoning from apricot kernels. *Emerg Med J.* 2011; 28: 804-805.
37. Reade MC, Davies SR, Morley PT, Dennett J, Jacobs IC; Australian Resuscitation Council. Review article: management of cyanide poisoning. *Emerg Med Australas.* 2012; 24: 225-238.