

Bilateral Optic Atrophy Following Methanol Poisoning: A Case Report

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Background: In Nigeria, in May 2015, outbreak of methanol poisoning was reported in Rivers State. We hereby report one of the cases.

Case Report: A 53-year old man presented to the ophthalmology clinic, University of Port Harcourt Teaching Hospital on account of sudden loss of vision in both eyes, following consumption of a substance believed to be alcohol eight days before presentation. The patient said that he had consumed about 400ml of illicit gin popularly called "ogogoro" with five of his friends in Woji town, a suburb of Port Harcourt. The estimated quantity of ogogoro consumed by his friends was 500-600ml each. The friends took ill after consuming the said product and died within 5-24 hours. The index patient developed vomiting, headache and diminution of vision about 2-3 hours after consumption of the toxic product. Past ocular and medical history were not contributory. There was no history of glaucoma or blindness in the family. On ocular examination the visual acuity was Hand Motion (HM) in both eyes. The pupils were widely dilated and there was no reaction to in both eyes. Fundoscopy showed bilateral optic atrophy and this was confirmed by fundus photography. Laboratory investigations revealed normal complete blood count, fasting blood sugar, renal and hepatic functions. Arterial Blood Gas (ABG) analysis revealed metabolic acidosis with a pH of 7.16, pCO₂ -16.2mmHg, HCO₃ -6.1 meq/L, Na⁺ -146 meq/L, K⁺ - 4.1meq/L and Cl⁻ -110.9 meq/L.

In view of suspicion of illicit toxic alcohol ingestion, epidemiological report of methanol poisoning outbreak in Rivers State, acute visual loss, metabolic acidosis and fundus photographic findings, the clinical diagnosis of methanol poisoning was entertained which met the diagnostic criteria listed in Table 1. The patient refused hospital admission because of financial constraints. He was however treated with sodium bicarbonate, folic acid, hydroxocobalamin, prednisolone and multivitamin tablets and advised to eat a well-balanced diet and abstain from drinking alcoholic beverages and smoking cigarettes. Patient was however lost to follow up so we do not know if there was any improvement in vision.

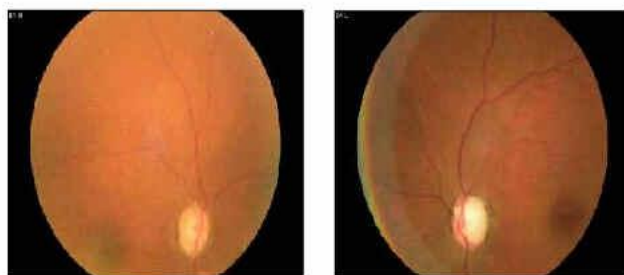


Fig. 1: Fundus photographs showing bilateral optic atrophy, worse in the left eye

Table 1: Criteria of Diagnosing Methanol Toxicity¹⁰

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| 1. Documented plasma methanol concentration >20 mg/dL (>200mg/L) |
| 2. Documented recent history of ingesting toxic amounts of methanol and osmolal gap >10mOsm/kg |
| 3. History or strong clinical suspicion of methanol poisoning with at least two of the following criteria |
| a. Severe metabolic acidosis i.e. Arterial pH <7.3 |
| b. Serum bicarbonate <20 meq/L |
| c. Osmolal gap >10 mOsm/kg (Any of the 3) |

Table 2: Comparison between diagnostic criteria described by Nand *et al*¹⁰ and the Index patient

Diagnostic criteria by Nand and Chandler	Parameter observed in the index patient
* History or strong clinical suspicion of methanol poisoning with at least two of the following criteria:	Confirmed and documented outbreak in R/S from 30th May to 15th June 2015.
a. Documented recent history of ingesting toxic amounts of methanol	a. Evidence of consumption of ogogoro by the patients with his 5 friends who later dead
b. Severe metabolic acidosis i.e. Arterial pH <7.3	b. metabolic acidosis with a pH of 7.16
c. Serum bicarbonate <20 meq/L	c. HCO ₃ -6.1meq/L
a. Documented plasma methanol concentration >20mq/dl (>200mq/l)	d. Was not done due to financial constraint

Discussion: Methanol is an industrial chemical found in many products including solvents and fuels. Most cases of poisoning among humans occur following accidental ingestion, inhalation and dermal exposure^[2]. Human beings may ingest toxic alcohols as an ethanol substitute or to inflict injuries on themselves^[3]. Methanol toxicity is common in many parts of the developing world, especially among members of the lower socioeconomic class^[3,4]. In many parts of the developing world, methanol is often a component of “bootlegged alcohol,” which is made in rural regions; because of its low cost, it is often consumed by members of lower socioeconomic class. The affected communities in Nigeria were sub-urban or rural with majority of the affected persons being of low socio-economic status and persons with known alcoholism. Our index patient is a known alcoholic and the incidence occurred while drinking with five other friends after the day's work. Methanol poisoning typically induces headache, nausea, vomiting, abdominal pain, and central nervous system depression, drowsiness which may progress to altered level of consciousness and coma. Uncompensated metabolic acidosis develops and visual function becomes impaired, ranging from blurred vision and altered visual fields to complete blindness, neurologic sequelae, and even death^[4]. Initial symptoms usually occur 12-24 hours after ingestion, but the incubation period may vary with the volume of methanol ingested^[3]. Our index

patient had headache, loose stool, and difficulty hearing and speaking, accompanied by swelling of the tongue and sudden loss of vision. Methanol poisoning carries a high mortality rate especially among rural dwellers with lack of infrastructure and tertiary care facilities^[4]. The lethal dose of methanol is 30-50ml; the smallest reported dose to cause death is 15 ml of 40% of methyl alcohol. Permanent visual loss may occur with doses as low as 10 ml^[3].

Conclusion: The early diagnosis of methanol poisoning aims at timely initiation of treatment including alcohol dehydrogenase inhibitors to prevent formic acid accumulation with its' resultant adverse effects – permanent blindness, coma and death. The late presentation of our case was worsened by ignorance and poverty thus leading to the typical clinico-pathological manifestations of severe metabolic acidosis and typical optic neurotoxicity. Prevention of methanol poisoning can be achieved through effective health education of the populace and enactment of enabling legislation prohibiting illegal distillation of alcoholic beverages.

References

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