

Unilateral Visual loss Due to Methanol Intoxication: A Case Report

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ABSTRACT

Methanol is a toxic alcohol which can cause severe bilateral visual impairment. In this study we report a case of unilateral visual loss due to methanol intoxication.

A 45-year-old man referred to toxicology department of Loghman Hakim Hospital complaining of bilateral blurred vision, vomiting, nausea. He was oriented and he had drunk about 500 cc alcohol two days ago, he underwent 4 hours of emergency hemodialysis and we also prescribed erythropoietin, Methylprednisolone, Amp folinic acid, Na/HCO₃. then he was referred to ophthalmologist that reported: right eye's acuity 7/10, left eye's acuity 3m, RAPD positive, left eye's abducent movement and its color was disturbed and retinal examination was consistent with methanol intoxication.

Visual impairment due to methanol poisoning usually occurs bilaterally, but rare cases of unilateral vision damage have also been reported in two studies which they stated may be due to anatomical or structural variation.

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INTRODUCTION

Methanol is a toxic alcohol which is metabolized in the body to formic acid and causes severe intoxication. Methanol poisoning is very dangerous because it can cause severe visual impairment (including irreversible bilateral blindness), metabolic acidosis, permanent neurological dysfunction and even death [1]. Irreversible visual loss may occur within hours to days after ingestion. Treatment regimens are aimed at controlling acid-base balance, removing the toxic agent by hemodialysis, or using ethanol solution as a competitive drug [2]. In this study we report a case of unilateral visual loss due to methanol intoxication.

CASE PRESENTATION

A 45-year-old man referred to toxicology department of Loghman Hakim Hospital complaining of bilateral blurred vision, vomiting, nausea. He was oriented and he had drunk

about 500 cc alcohol two days ago and was suffering from blurred vision since yesterday.

Laboratory blood tests was as following (Table 1):

Patient's history, clinical signs and laboratory test results confirmed methanol toxicity so 4 hours of emergency hemodialysis performed for him, alcohol 96 140cc and 560cc D/W 5% administered during hemodialysis, we also prescribed erythropoietin (Eprex 10000U) SC for 3 days, Methylprednisolone 250mg IV every 6 hours for 3 days, Amp folinic acid 60mg for 3 hours, 3 vial Na/HCO₃ IV stat. VBG results after hemodialysis showed: PH: 7.54, PCO₂:48.4, HCO₃:23.7 So metabolic acidosis and right eye's vision was corrected but not the left eyes. Considering patient's condition hemodialysis was done for the second time, but he still suffered from central field loss in the left eye then he was referred to ophthalmologist that reported: right eye's acuity 7/10, left eye's acuity 3m, RAPD



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Table 1. Laboratory tests result

Test	Result	Test	Result	Test	Result
PH	7.16	PTT	29.9	Na	141
HCO ₃	9.2	INR	1.03	K	5.1
PCO ₂	9.2	FBS	140	Aspirin	Negative
AST	27	PT	11.2	Ethanol	Negative
ALT	25	BUN	28	Methanol	12.2
ALP	273	PTT	29.9	Acetaminophen	5>
PT	11.2	Cr	1.4		

positive, left eye's abducent movement and disturbed, fundoscopic examination (Figure 1) was consistent with methanol intoxication. Systemic erythropoietin (Eprex 10000U) for 3 days and Brimogan (Brimonidine and Timolol) TDS has been prescribed for left eye.

In sporadic cases, 33 cases (78.6%) were N0 and 9 cases (21.4%) were N1 and in familial cases, 6 cases (75%) were N0 and 2 cases (25%) were N1 ($p = 0.823$ - based on chi square).

There was no mortality in all patients during the study.

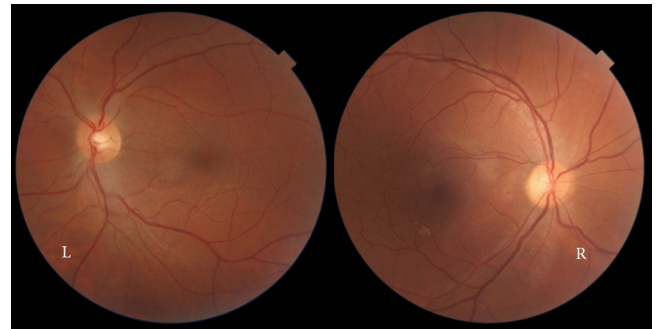
DISCUSSION

Methanol poisoning can cause vision loss with damage to the visual pathways[3]. Studies have shown that the myelin sheath of the retrolaminar optic nerve is selectively vulnerable to methanol poisoning due to its anatomical structure [4, 5]. Accumulation of formic acid metabolites is the cause of retinal and optic nerve damage. Depending on the severity of the poisoning and the duration of exposure to formic acid, this damage to visual structures may cause permanent vision loss [6]. Visual impairment due to methanol poisoning usually occurs bilaterally, but rare cases of unilateral vision damage have also been reported in two studies [6, 7], which one of them reported 20/20 acuity in the one eye, but only hand motion detection from another eye. The other case was among a case series study on 16 patients that unilateral blindness observed in one of them due to unilateral optic neuropathy. They stated may be due to anatomical or structural variation. Treatment maybe the reason of vision improvement and some studies have reported improvement in vision loss after poisoning treatment[8], but the return of vision was not symmetrical in our patient's eyes.

In conclusion such abnormal case reports can help to raise awareness of the diversity of the sequela of methanol poisoning.

REFERENCES

1. Doreen B, Eyu P, Okethwangu D, Biribawa C, Kizito S, Nakanwagi M, et al. Fatal methanol poisoning caused by drinking adulterated locally distilled alcohol: Wakiso District, Uganda, June 2017. 2020;2020.
2. ROTENSTREICH Y, ASSIA EI and KESLER AJB. Late treatment of methanol blindness. 1997;81(5):415-15.
3. Yang C, Tsai W and Lirng JJE. Ocular manifestations and MRI findings in a case of methanol poisoning. 2005;19(7):806-09.



.Figure 1. Fundoscopic examination of the eyes. R: Right eye, L: Left eye

4. Sharpe J, Hostovsky M, Bilbao J and Rewcastle NJA-JoO. Methanol Optic Neuropathy. A Histopathological Study. 1983;95(1):134.
5. Benton Jr C, Calhoun Jr FJT-AAoO, Ophthalmology OAAo and Otolaryngology. The ocular effects of methyl alcohol poisoning: report of a catastrophe involving three hundred and twenty persons. 1952;56(6):875.
6. Lu JJ, Kalimullah EA and Bryant SMJJ. Unilateral blindness following acute methanol poisoning. 2010;6(4):459-60.
7. Brahmi N, Blél Y, Abidi N, Kouraichi N, Thabet H, Hedhili A, et al. Methanol poisoning in Tunisia: report of 16 cases. 2007;45(6):717-20.
8. Sivillotti ML, Burns MJ, Aaron CK, McMartin KE and Brent J. Reversal of severe methanol-induced visual impairment: no evidence of retinal toxicity due to fomepizole. J Toxicol Clin Toxicol. 2001;39(6):627-31.