

# Methaemoglobinemia secondary to Disulfiram: a Case Report



Dr Neera Gajree, Consultant in Addictions Psychiatry, NHS Lanarkshire

Miss Natasha Khan, 5<sup>th</sup> year medical student, University of Glasgow

## Background

Disulfiram (also known by the brand name Antabuse) is used to help patients suffering from alcohol dependence maintain abstinence from alcohol. Disulfiram inhibits the enzyme aldehyde dehydrogenase, resulting in the accumulation of acetaldehyde when alcohol is consumed. Adverse effects can be caused by consuming alcohol, and side effects to Disulfiram can also occur independently of alcohol use.



## Patient Case

A 35-year-old white Scottish male patient was referred to the local Addictions Psychiatry service with a history of alcohol dependence. He had been abstinent from alcohol for 2 weeks and was keen to commence Disulfiram. No contra-indications to Disulfiram were noted, and he was commenced on the drug at a dose of 200mg daily.

One week after commencing Disulfiram, the patient presented at the Emergency Department complaining of a severe headache and blue tinged lips. He strongly denied the use of any alcohol or illicit drugs since commencing Disulfiram. His lips appeared cyanosed and his oxygen saturations were 80% on air.

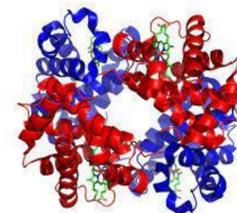


An arterial blood gas showed a reduced partial pressure of oxygen and a methaemoglobin (MetHb) level of 39.6%. The patient was diagnosed with methaemoglobinemia.



## Discussion

MetHb arises when the iron component in haemoglobin is in the ferric state, which cannot bind oxygen and carry it to tissues. The concentration of MetHb is normally less than 1% of the total haemoglobin. Methaemoglobinemia occurs when MetHb is present at levels of greater than 1%. The resulting hypoxia can cause respiratory, neurological and cardiac symptoms. MetHb levels over 70% usually result in death.



Methaemoglobinemia is either congenital or caused by drugs. Disulfiram is not commonly cited as a drug that can result in methaemoglobinemia. However in 1997, Stransky and colleagues<sup>1</sup> published a case report of a patient who suffered from methaemoglobinemia which was attributed to their use of Disulfiram. As Disulfiram was the only medication recently commenced in our patient, he was diagnosed with methaemoglobinemia secondary to Disulfiram use.

For patients with symptomatic methaemoglobinemia, the treatment is intravenous methylene blue. After receiving methylene blue, our patient's oxygen saturations improved to 97% on air and his MetHb level reduced to 0.3%.

### Methylene Blue



(1) Stransky G et al. (1997). Methemoglobinemia in a fatal case of disulfiram-ethanol reaction. *J Anal Toicol* 21(2): 178-179

## Conclusion

The risk of developing methaemoglobinemia secondary to Disulfiram needs greater recognition, given the potentially fatal nature of the condition. It appears to be rare phenomenon - to the authors' knowledge, this is only the second reported case of Disulfiram causing methaemoglobinemia.