Carbon Monoxide (CO) Poisoning

- Carbon monoxide (CO) is a colorless and odorless gas
- Produced during incomplete burning of organic matter
- Occur from motor vehicles, heaters, or cooking equipment that run on carbon-based fuels
- Carbon monoxide poisoning occurs from breathing in carbon monoxide at excessive levels

CO has a high affinity for hemoglobin and myoglobin → Left-shift of the oxygen dissociation curve → Displace oxygen from hemoglobin binding sites

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Tissue hypoxia

- Despite hypoxemia, skin is pink or pale & oxygen saturation (SpO_2) from a pulse oximeter is normal

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Check arterial blood gases (ABGs)

It will show low SpO_2, low PaO_2, and high Carboxyhemoglobin (HbCO)

- Normally, Carboxyhemoglobin levels should be <5% in non-smokers, and <10% in smokers

Clinical Features

- Headache (90% cases)
- Nausea & vomiting
- Vertigo
- Confusion
- Weakness (subjective)
- *Severe toxicity* - ‘Pink' skin and mucosae, hyperpyrexia, extrapyramidal features, fits, coma, arrhythmias, cardiac arrest & death.

Investigations

ABGs

- Confirm diagnosis with an ABG quickly, as levels may soon return to normal
- HbCO Levels
  - < 3% in non-smokers
  - < 10% in smokers
  - 10 - 30% - Symptomatic, with headache and vomiting
  - > 30% - Severe toxicity

ECG

- Look for cardiac ischemia
- Monitor for arrhythmias in severe toxicity

Treatment

- Remove from the source of poisoning
- **100% high-flow oxygen** (via a non-rebreather mask) - decreases half-life of carboxyhemoglobin. Treatment is generally continued until all symptoms have resolved, rather than monitoring Carbon monoxide levels.
- **Hyperbaric oxygen**
  - Severe toxicity
  - Loss of consciousness at any point
  - Neurological signs other than headache
  - Myocardial ischemia or arrhythmia
  - Pregnancy
- In severe cases, anticipate cerebral oedema, and give mannitol IV infusion.

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