Management of burns in ED

INHALATION INJURY

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INHALATION INJURY

- Most associated with burns to the face and neck.
- Increases mortality rate.
  - 30% in adults, 50% in children.
- Can lead to local and systemic toxic effects.
- Management of the airway is to provide a patent airway to facilitate ventilation and oxygenation.
- Obstruction.
- Alveolar dysfunction.
- Alveolar fluid.

INHALATION INJURY…cont

1. Airway injury above the larynx
   - Inhalation of hot gases.
   - Most likely to occur when a person has been trapped in a confined space.
   - Damage is proportional to time of exposure.
   - Inflammatory mediators cause oedema which can lead to obstruction and eventually loss of mucosa functions.
   - Respiratory obstruction can be caused from soft tissue oedema. Burn to the outer skin can also cause obstruction due to oedema of external airway.
   - **NOTE:** burns >20%TBSA can lead to systemic inflammation even if there is no direct injury to the airway.

INHALATION INJURY…cont

2. Airway injury below the larynx
   - Inhalation of products of combustion.
   - Fires lead to the oxidation of compounds that contain carbon, sulphur, phosphorus and nitrogen.
     - Eg. Carbon monoxide, cyanide, ammonia, hydrogen chloride, phosphorus, nitrogen.
   - Acids or alkalis are produced when these substances are dissolved in water, which is found in the alveoli and airway. This then leads to chemical burns of the lower respiratory tract.

INHALATION INJURY…cont

3. Systemic poisoning
   - Carbon monoxide (CO)
     - Produced by incomplete oxidation of carbon.
     - CO diffuses quickly in to the blood and binds with haemoglobin more strongly than oxygen, reducing the oxygen–carrying ability of blood.
     - Carboxyhaemoglobin (COHb) gives a false appearance of pink skin making you think the patient is well perfused.
     - A pulse oximeter cannot distinguish between COHb and oxyhaemoglobin– false saturation reading.
     - A blood gas machine can also give false PaO2 results, therefore, COHb is the gold standard.
     - CO poisoning leads to confusion and can exhibit similar behaviours as hypoxia.

INHALATION INJURY…cont

- Cyanide (HCN)
  - Production of hydrogen cyanide from burning plastic or glue.
  - HCN is absorbed through the lungs and when it binds to the cells, HCN stops lung function and can leads to anaerobic metabolism.
  - Causes LOC, neurotoxicity and convulsions.

- Airway injury should be suspected from the history.
  - History of a burn sustained in an enclosed area (house, car) or during an explosion or burns to the face should be treated with an associated inhalation injury.
- Treatment of suspected inhalation injury:
  - Patent airway
  - High flow oxygen
  - Monitor respiratory deterioration
  - If in doubt…intubate