OXYGEN THERAPY AND THE COPD PATIENT

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DISCOVERY OF OXYGEN
The Pneumatic Institution
THE 19TH CENTURY
Early 20th Century
THE FIRST WORLD WAR
FIRST NASAL PRONGS 1920's
Oxygen tent 1930`s
THE SECOND WORLD WAR
Multicentre Trials of Long Term Oxygen Therapy

1980 The NOTT trial

1981 MRC Trial

Petty combined the results of both trials
**TERMS USED**

**Hypoxaemia**
- Diminished amount of $O_2$ in the arterial blood

**Hypoxia**
- Insufficient $O_2$ at tissue level

**Anoxia**
- No $O_2$ at tissue level

**Hypercapnoea (hypercarbia)**
- High $CO_2$ in the blood
Respiratory Failure

Type 1
- Hypoxaemia with a normal or low CO$_2$

Type 2
- Hypoxaemia with a high CO$_2$
SIDE EFFECTS OF OXYGEN THERAPY

• Retrolental fibroplasia
• Risk to COPD patient (hypercapnoea)
• Atelectasis
• Oxygen toxicity
• Hyperoxaemia associated with INCREASED mortality in survivors of cardiac arrest
• Oxygen therapy INCREASED mortality in non-hypoxic patients with mild-moderate stroke
THE OXYGEN-HAEMOGLOBIN DISSOCIATION CURVE
RATIONALE FOR PRESCRIBING OXYGEN THERAPY FOR COPD PATIENTS

- Hypoxaemia

- LTOT is prescribed to prevent secondary complications of the heart & other organs

- When administered to those clinically indicated, LTOT improves longevity and quality of life

*Oxygen is not given for breathlessness*
O2 for COPD Patient

- Provision of O2 in a patient who has or who is at risk of hypercapnoea may lead to increased CO2 levels and eventual apnoea

- However, failure to administer oxygen puts a patient at greater risk than does hypercapnoea

- Therefore when giving oxygen we need to assess and monitor acid base balance
NURSING CONSIDERATIONS

- Oxygen must be prescribed
  - Documentation:
    - Rate or %
    - Device
    - SpO$_2$ at rest on air
      - (10mins – for patient with diseased lung, 1 min for other)
  - If no O$_2$ in situ please document R/A (room air)
  - Nursing assessment
  - Care plan
CURRENT GUIDELINES FOR EMERGENCY OXYGEN THERAPY

British Thoracic Society (BTS) Guidelines

- Oxygen is only recommended for hypoxaemic patients

- Rationale for the target saturations is a combination of what is normal and what is safe

  - Most patients 94 - 98%

  - Risk of hypercapnic respiratory failure 88 – 92%*

*Or patient specific saturation on Alert Card
New Zealand Ministry of Health Specifications for Provision of LTOT

- Patient must be in a stable clinical state for at least 4 weeks
- Maximal medical treatment must be in place
- Evidence of no smoking for at least 4 weeks
- A PaO2 < 55mmHg on air performed on two occasions 2-3 weeks apart
- Palliation of terminally ill with disabling dyspnoea inadequately controlled on narcotics or anxiolytics with SpO2 < 90% on room air at rest
OXYGEN CONCENTRATORS
FUTURE DIRECTIONS

Further research;
LOTT trial
Effects on cognition/ brain function
Benefits during exercise
Health related quality of life
Nocturnal desaturation
Type of oxygen delivery
Other chronic lung diseases
Other comorbidities associated with COPD, phenotypes
IN SUMMARY

- Oxygen can be life a saving therapy for hypoxaemic patients
- LTOT can improve longevity for hypoxaemic patients with COPD
- Oxygen therapy can be harmful and so should be assessed and monitored before and during treatment
- Failure to administer oxygen puts a patient at greater risk than does hypercapnoea
- There is need for robust ongoing research regarding the appropriate use of oxygen for those with COPD and other chronic lung diseases.
Oxygen Bars