Transnasal Humidified Rapid Insufflation Ventilatory Exchange (THRIVE):
An Optimal Method of Preoxygenation for General Anaesthesia in Obstetrics

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Aims

• Brief introduction on use of nasal $O_2$ therapy

• Benefits of THRIVE during RSI

• Our experience with THRIVE in obstetrics
Introduction

- Low Flow Nasal Cannula (LFNC) O₂ therapy
- High Flow Nasal Cannula (HFNC) O₂ therapy
- THRIVE
What is THRIVE?

• Apnoeic oxygenation - *if* a patent airway

• CPAP of 3 - 7cmH₂O

• Dead space flushing

Why Use THRIVE to Preoxygenate?

- Patel used THRIVE for oxygenation and ventilatory exchange—planned prolonged procedures.

- We use THRIVE during RSI
  - Start PO whilst preparing drugs and equipment
  - Reach target of EtO₂ 0.9 quicker
Stolady et al. Comparison of the rate of conventional bag-mask preoxygenation (CFMP) preoxygenation with THRIVE. Poster presented at CARE 2015

Why Use THRIVE to Preoxygenate?

- PO continues *during* airway manipulation
- No loss of $O_2$ when suctioning pharynx
- Allows apnoeic oxygenation with *patent* airway
- More comfortable than CPO
- Can be used for extubation and recovery

Why use THRIVE in Obstetrics?

• GAs in obstetrics are high risk

• Increased incidence of difficult airway

• PO is known to be performed poorly

• CPAP generated from the high flow may also improve the already compromised FRC
Why use THRIVE in Obstetrics?

- Reduced exposure to obstetric GA during training

- Any means of improving PO and extending the safe apnoea time is beneficial
Why use THRIVE in Obstetrics?

- New OAA/DAS guidelines suggest nasal oxygenation

Our Experience with THRIVE

• R&D approval – service evaluation

• Primary objective
  – Assess if using THRIVE for PO is feasible in obstetrics
  – Assess the rate of oxygen desaturation
  – Share our experience with others

• Secondary objective
  – Neonatal outcomes
Method

- ALL obstetric GAs were included
- Anaesthetists choice of THRIVE vs standard
- If THRIVE used – started on arriving in theatre
- All other aspects of obstetric GA remained unchanged
Equipment

• Fisher & Paykel Optiflow system
Results

- 8/9 patients included

- Average BMI 31.5 (19 - 51)

<table>
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Results

• Average apnoea period 55s (10 – 180s)

• Laryngoscopy grade
  – Grade 1 (7)
  – Grade 2 (2)

• All patients intubated first time
Observations

Relationship between apnoea time and oxygen saturation

Minimum oxygen saturation (%)

Apnoea time (sec)

Values of minimum oxygen saturation decrease with increasing apnoea time.
Is Too Much Oxygen Harmful?

• Use of $O_2$ in El. LSCS
  – Lipid peroxidation without a significant increase in fetal $PO_2$
  – No benefit and potential harm

• No benefit in El. LSCS with prolonged U-D time


Is Too Much Oxygen Harmful?

• $\text{FiO}_2$ 0.6 during Em. LSCS under RA
  – improved fetal oxygenation
  – with *no* increase in lipid peroxidation
  – *Potential benefit*

• All done under RA not GA

Is Too Much Oxygen Harmful?

- Increase in free radical activity during GA LSCS
  – independent of FiO$_2$ used

• THRIVE just used for PO
  – Usual gas mix once intubated successfully

• Our neonatal outcomes
  – Apgars all $\geq 7$ at 1 min, all 9 at 5 min
  – All cord gases pH $\geq 7.2$

• Benefit of improved PO and extended safe apnoea period out-weighed potential risks
Conclusion

• Well tolerated by awake patients

• Allows PO to start sooner and reach target quicker

• Allows peri-intubation oxygenation

• Extends the safe apnoea window

• Can be used during extubation and recovery
Thank You
References


Setting it up

- High flow meter 60+ L min\(^{-1}\)
- Green O\(_2\) Tubing
- Diffusing “filter”
- Humidification Chamber
- Humidifier on
- Breathing Circuit
- Patient Bacterial Filter
- Nasal Interface

It’s easy and quick, warms up in 3-5 minutes
Keep ready for use
Leave ON