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Method for Better Oxygenation For Endoscopic Procedures under Deep Sedation

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INTRODUCTION

Usual method of giving supplement oxygen during upper G I endoscopy (GIE) is nasal cannula. Some patients can not tolerate the procedures and normal sedation. These patients are then referred to the Anaesthetist for deep sedation. Hypoxaemia is a major complication during GIE procedures (upper/lower) when performed under deep sedation in the procedure room. Standard oxygen therapy (SOT) is used to prevent hypoxaemia. Data suggest that risk factors for hypoxaemia under deep sedation during GIE are obstructive sleep apnoea syndrome, a body mass index above 30 kg/m2, high blood pressure, diabetes, heart disease, age over 60 years old and high ASA scores. It is therefore common to give a complete General anaesthesia (GA)for these patients. Our aim was to modify the method of oxygenation for deep sedation and avoid a GA.

BACKGROUND

Research Aims

- We will have complete monitoring of every patient as recommended by Association of Anaesthesia Great Britain and Ireland (AAGBI).
- Our method will allow us to measure the End Carbon Dioxide (Capnography) and look for any Apnoeic episodes.
- We aim to have safer method for our patients with better tolerance during the procedure.
- We aim to maintain better oxygenation. Also this method protects every one from this aerosol generating procedure (AGP). This is more important during this pandemic of COVID 19.
- This technique can also be useful for other similar procedure e.g. Bronchoscopy and Awake Intubation

METHOD

Patients are included after informed consent. We aim to look for the following events displayed in the table below.

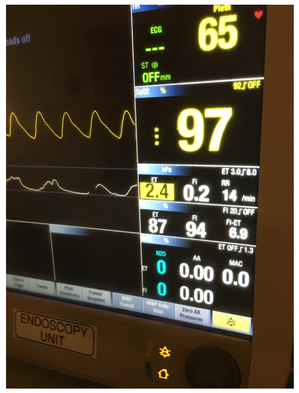
Intraoperative Considerations
The number of episodes of apnoea (defined as respiratory rate ≤6/min)
The incidence of hypoxaemia with an SpO2 ≤90%
The incidence of severe hypoxaemia (defined as SpO2 ≤85%)
The incidence of prolonged hypoxaemia (SpO2 ≤92% during ≥60 s)
The need to use mask ventilation or to perform any airway intervention.
The stability of the SpO2, respiratory rate, heart rate and blood pressure
The incidence of bradycardia (defined by a heart rate <50/min)
The need to stop the procedure
The incidence of the failure of the endoscopic procedure
The duration of the endoscopy being more than an hour
The duration of sedation (from the induction to the awakening of the patient) > 1hr
The time spent in recovery room > 1hr
The number of ambulatory patients who needed to be hospitalised after the procedure.

Practical Aspects:
Intravenous line will be secured as well as full monitoring (AAGBI) established.
A mouth gag will be secured followed by a Hudson Oxygen mask with a flow of 8 10 litres per minute. This mask will allow us to monitor Carbon Dioxide levels and incidence
of apnoea, with a separate port for introduction of endoscope.

Standard sedation medications will include suitable doses of
1. Midazolam
2. Alfentanil
3. Boluses of Propofol

There is a plan for two separate dedicated Anaesthetists to perform the procedure to maintain the standard . The readings will be recorded by another person and not the performing Anaesthetist.
We have performed 50 cases initially and evaluating our initial findings with on-going data collection.

Inclusion Criteria	Exclusion criteria
Patients older than 18 years old.	GIE performed in emergency.
• Patients scheduled for GIE (upper and/or lower endoscopy), for which sedation with maintenance of spontaneous breathing is planned (as determined during the anaesthesia pre-op assessment)	Necessity to intubate the patient for the procedure
Patients who have provided signed consent	Patient under oxygen therapy at home
At risk of hypoxaemia with at least one of the criteria described	Tracheostomised patient.
At risk of hypoxaemia with at least one of the criteria described above.	Pregnancy



RESULTS

10 out of 50 patients had at least one episode of apnoea however only 1 patient developed an incidence of hypoxemia as a consequence of this and more reassuringly none of the patients developed any incidence of severe hypoxemia. All of the patients remained safe from any prolonged hypoxemia, and remained haemodynamically stable. None of the patients developed any bradycardia or provided any reason for the need to stop the endoscopic procedure or caused any hinderance or failure of the endoscopic procedure. Out of the 50 patients investigated, only 1 patient had an incidence of the endoscopy procedure taking more than an hour, the sedation lasting more than an hour, the need to provide a jaw thrust and subsequently the need to intubate in recovery and admit patient to ITU due to aspiration.

CONCLUSION

Our initial findings are very promising with very favourable outcomes found. The apnoea episode found in 10 patients is not surprising as arguably sedation is an art form and not an exact science and with the Anaesthetists best efforts to tailor the drug dosages to the patient type, invariably different patients will respond individually to the sedative drugs. It is however the continuous oxygenation that is possible using this technique that ensures that severe hypoxemia is avoided in all the patients as well as the ability to recognise and monitor the apnoeac episodes that allows prompt intervention from the Anaesthetist. We had one patient who , despite being pre-assessed, had an incidence of hypoxemia , prolonged recovery time and consequently an ITU admission. This was attributed to multiple positional changes to aid an unexpectedly challenging endoscopy procedure, with a prolonged endoscopy and sedation time leading to patient aspirating causing haemodynamic compromise. This highlights an important limitation to this technique of not being able to have a secure airway whilst carrying out a procedure with a high aspiration risk. In this case, the procedure was unexpectedly complex and not initially expected to have taken this long but good patient selection is key. The versatility of this technique for various endoscopic procedures, ability of better oxygenation and monitoring has been represented in our encouraging results so far and we hope to continue to gather data to see this technique's potential to be used as standard in endoscopy and in vastly improving patient safety.

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