CASE SERIES: Using high flow nasal oxygen (Optiflow) with deep sedation for complex orthopaedic operations

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Background and Project Objectives

The demand for deep sedation from anxious patients is growing as regional anaesthesia is increasingly being performed for orthopaedic operations. Patients with greater comorbidities are becoming more common in our daily clinical practice. Hypoxaemia becomes a cause for concern when deep sedation is requested especially for patients at high risk of desaturation, such as patients who are obese or with respiratory illnesses. The use of Optiflow for procedural sedation has been reported for endoscopic [1], bronchoscopic and dental procedures but we are not aware of it being described in orthopaedic surgeries.

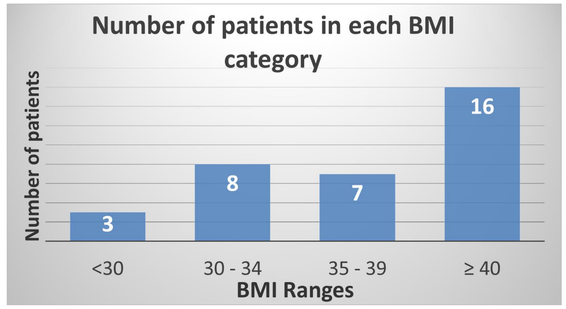
Methods

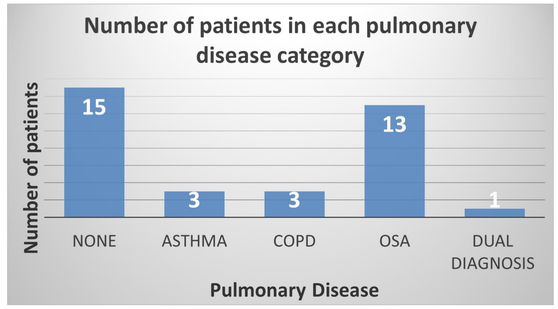
Following approval from the Trust's Research and Development team, data from patients who are having regional anaesthesia and intravenous sedation for their operations was collected. These include patient demographics (age, weight and BMI) and type and length of operations. Optiflow is used with the anaesthetist's preferred choice of intravenous sedation to maintain a RASS score between -2 to -3 intraoperatively. During the operation, we recorded lowest oxygen saturations and any documented discomfort or conversion to general anaesthesia.

Results

Data was collected from a total of 35 patients. Sedation was maintained with propofol or ketofol (ketamine mixed with propofol 1:5) TCI.

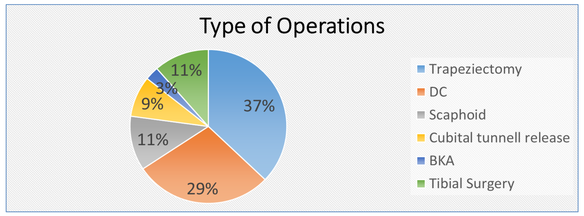
Patient Demographics

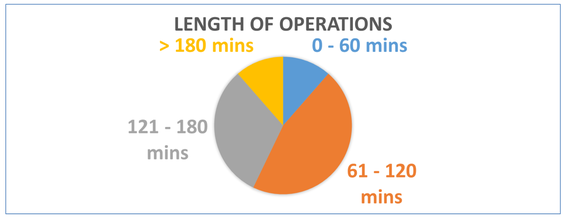




Average age : 52 years
Average weight: 106 kg

Operative Procedures





Intraoperative Events

Lowest Oxygen Saturations – 98%
Intraoperative GA conversion – 0 cases
Intraoperative discomfort – 0

Discussion and Learning Points

Compared to standard oxygen therapy, studies have shown that Optiflow can achieve higher FiO2, provide low level positive end-expiratory airway pressure and reduce arterial CO2 concentration through the washout of anatomical dead space [2]. These features of Optiflow have allowed the provision of deep sedation and anxiolysis for our high risk patients undergoing complex orthopaedic operations without any adverse events. Avoiding general anaesthesia in these patients can be advantageous since they are at greater risk of airway difficulties, pulmonary complications, awareness under general anaesthesia and overall increased morbidity and mortality [3]. Using Optiflow with deep sedation is a feasible and safe alternative to GA. In summary, Optiflow increases the safety of intravenous sedation and can be used safely in patients at risk of hypoxemia requiring sedation for complex orthopaedic operations mitigating the risk of intraoperative GA conversion.

References:
1. Chi Chan Lee, O. P. (2018). Use of high-flow nasal cannula in obese patients receiving colonoscopy under intravenous propofol sedation: A case series. Respiratory Medicine Case Reports, 118-121
2. Benjamin H.Millette, V. A. (2018). High flow nasal oxygen therapy in adult anaesthesia. Trends in Anaesthesia and Critical Care, 29-33.
3. C. E. Nightingale, M. P. (2015). Peri-operative management of the obese surgical patient 2015. Anaesthesia, 859-876.