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Monitored anaesthesia care with dexmedetomidine or paracetamol for patients undergoing vitreo-retinal surgeries under sub-tenon's anaesthesia

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Abstract
The needleless sub-tenon's block is being increasingly used for vitreo retinal surgeries. The present study is to evaluate the safety and efficacy of "needleless" regional anaesthesia through the sub-tenon route for vitreo retinal surgery with Dexmedetomidine or Paracetamol infusion as sedation for Monitored Anaesthesia Care (MAC).

Methods: Twenty eight patients were included and studied after ethics committee approval. These consented patients were in American Society of Anaesthesiologists physical status I-III of both sexes. They were given 0.75% Ropivacaine through sub-tenon route. Any complication such as intra-ocular pressure rise or orbital haemorrhage were noted. Twenty four hours after the surgery, the patients were asked to grade their pain during postoperative period and was noted on a 10 point visual analog scale. The need for any rescue analgesic was also noted. Patient's demography, co-morbidities and previous vitreo-retinal surgeries performed were recorded. The haemodynamic stability, respiratory depression or any complication due to technique or medications were also recorded as secondary outcomes.

Results: Desired sedation score of 2-3 was effectively achieved with intraoperative infusions of Dexmedetomidine (Group D) and Paracetamol (Group P). Seven patients had marginal hypotension and bradycardia in group D which did not require any active treatment. The duration of postoperative analgesia was significantly prolonged in group D compared with group P as assessed by visual analogue scale. Respiratory depression did not occur in any patient. No adverse events inherent to sedative medication or technique were observed in any patient.

Conclusion: Needleless regional anaesthesia appears to be safe and effective and can thus be considered as an alternative to routine peribulbar block for vitreo- retinal cases. The clinical efficacy and safety of Dexmedetomidine was better than Paracetamol in terms of sedation and intraoperative haemodynamic stability without respiratory depression.

Keywords: sub-tenon anaesthesia, vitreo-retinal surgery, dexmedetomidine, Paracetamol, ropivacaine, monitored anaesthesia care

Introduction

Sub-tenon's block is an efficient regional anaesthetic technique. A single injection of local anaesthetic drug is adequate even for a long duration vitreo- retinal surgery.

Monitored anaesthesia care combines the intravenous sedation with regional anaesthetic technique. The intravenous sedation is used to diminish the anxiety and apprehension of patients with depressed level of consciousness without obtunding the protective reflexes. The patient remains appropriately responsive to verbal commands and is able to maintain the airway independently [1]. Several techniques of intravenous sedation are available during regional anaesthetic blocks with primary goals to achieve sedation while maintaining arousability, co-operation and haemodynamic and respiratory stability.

Current drugs of choice include intravenous Midazolam, Opioids, and Propofol but these medications are associated with limitations of respiratory depression, lack of orientation, severe hypotension and gastro-intestinal hypomotility. Dexmedetomidine produces co-operative sedation and hence is indicated for sedation during the surgical procedures under regional anaesthetic techniques. The dosage of sedatives is titrated to attain the desired score of sedation (2-3) on the Ramsay Sedation Scale [2].

The present study aimed to compare the sedative efficacy and safety of Dexmedetomidine infusion with Paracetamol infusion for monitored anaesthesia care during vitreo- retinal surgeries under sub-tenon anaesthesia.

Patients and Methods

Twenty eight patients of American Society of Anaesthesiologists physical status I-III of both sexes between 20-70 years of age were scheduled for elective vitreo-retinal surgery under sub-tenon anaesthesia. Exclusion criteria were as follows: Infection of the operating eye, refusal to technique, previous surgery like scleral buckle of the given eye.

All the patients were admitted the day before the surgery and fasted for four hours preoperatively. On arrival in the operating room, an I.V. access was established and connected to an I.V. fluid. Monitoring included ECG, NIBP and Pulse Oximetry. Baseline vitals were recorded. The patients were given 1mg Inj. Midazolam and 4 mg Ondansetron intravenously. A three way adaptor was connected to the cannula and either Inj. Dexmedetomidine (0.5 mcg/Kg/hour) or Inj. Paracetamol (10mg/ml, 100ml) was started through infusion pump.

The dose of infusion was titrated to achieve a sedation score of 2-3 on the Ramsay sedation scale. In both the groups the infusion was continued till the end of the surgery.

The eye to be operated was thoroughly cleaned and topical

Proparacaine drops were applied twice at five minutes interval. A drop of Povidone Iodine was also instilled. A self-retaining eye speculum was inserted. A small incision was made in the inferior nasal quadrant 5-7mm from the limbus between the insertions of medial and inferior Recti. A curved scissor was passed along the sclera in closed position till it crossed the equator of the eye. A specially designed sub-tenon's cannula fixed to a 5ml syringe with 0.75% Ropivacaine with hyalase was passed along the curvature of the globe and the local anaesthetic is slowly injected after negative aspiration.

The cannula is then slowly withdrawn and a drop of antiseptic is inserted at the end of the procedure. Akinesia is checked and a gentle digital pressure is applied for 2-3 minutes to facilitate even drug distribution. The onset of the block was assessed by inability to open the eye, akinesia and absence of stinging sensation on instillation of Povidone iodine.

Duration of sensory analgesia was defined when the patient demanded the first rescue analgesic and was assessed using the visual analogue scale.

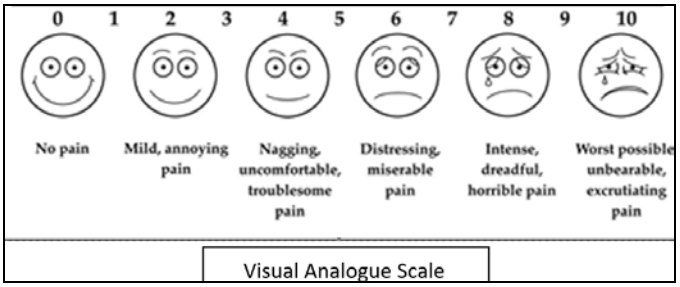

Fig 1

Patients were assessed for sedation using the Ramsay Sedation Score.

1. Awake. Patient is anxious and agitated or restless or both.
2. Patient is co-operative, orinted and tranquil.
3. Patient responds to commands and asleep.
4. Patient exhibits brisk response to stimulus
5. Patient exhibits a sluggish response to stimulus
6. Patient exhibits no response [3].

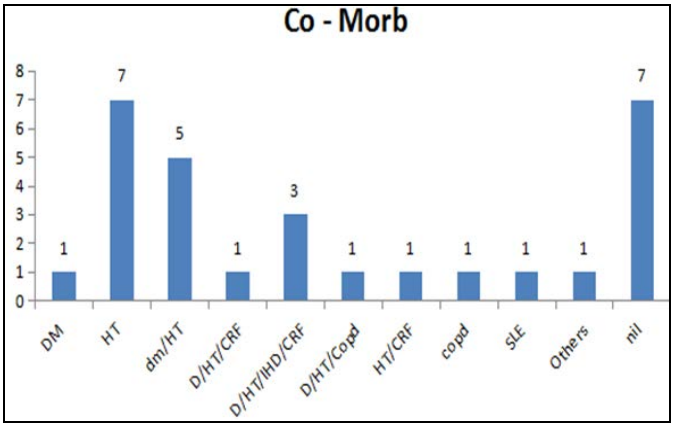

Fig 4

Intra-operatively heart rate, blood pressure, SaO_2 were recorded and any incidence of bradycardia, hypotension, or fall in peripheral oxygen saturation was noted and managed according to clinical protocols. Patients were observed for any discomfort, nausea, vomiting, shivering, pain, or any other side effect. Any need for additional medication was also recorded.

Results

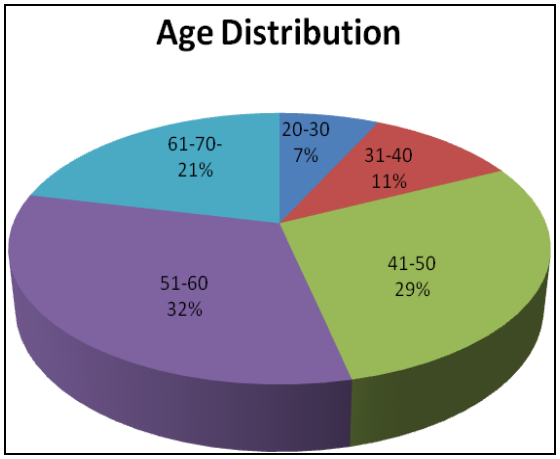

Fig 2

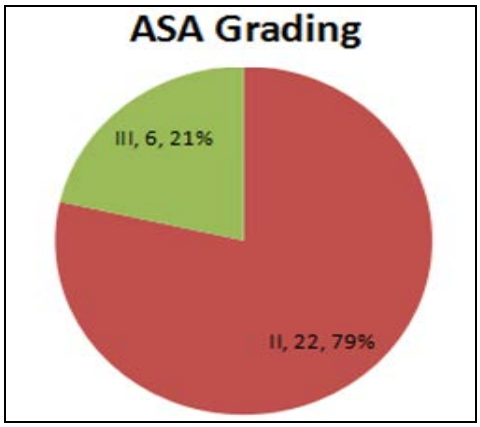

Fig 3

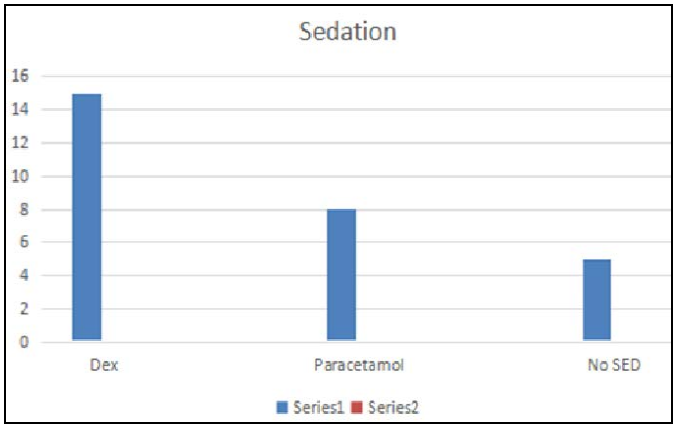

Fig 5

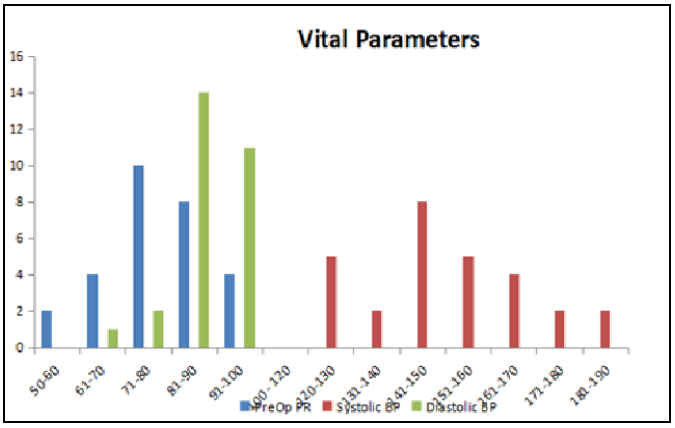

Fig 6

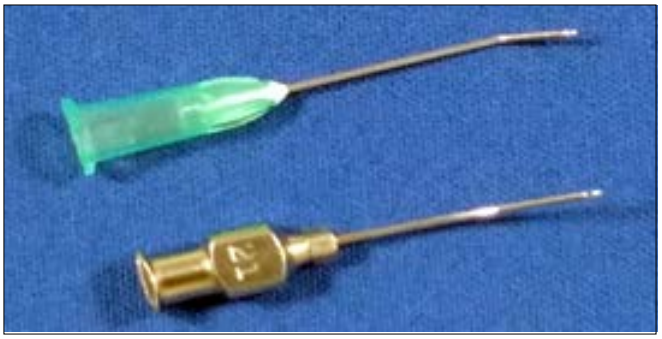

Fig 7

None of the patients needed rescue analgesic in the postoperative period and no complications were observed in the postoperative period.

Conclusion

Many patients are anxious prior to and during ophthalmic surgery [4]. This can be due to concerns about having their eye operated on or pain and discomfort both while the block is being performed or during surgery [5]. Also the surgical drapes covering their faces during surgery makes some of the patients claustrophobic. Many patients have retained visual sensations under local anaesthesia. In one survey, 16% found this distressing [6, 7]. Anxiety results in catecholamine release. Furthermore, many patients coming for vitreo retinal cases are past their middle age and have co-morbidities like diabetes, hypertension, cardio-vascular disease and renal impairment.

Pre-operative counselling and sedation can be used to control catecholamine secretion, thus minimising tachycardia and hypertension and alleys their fears about surgical drapes.

Ophthalmic surgical techniques have changed over the years, hence the need for sedation and analgesia. Sedation remains the main stay in the prevention of the pain of needle or cannula insertion. Dexmedetomidine has added advantage of cerebro protective, cardio protective and reno protective properties all of which helps in these morbid patients.

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