Comparison of subtenon's anaesthesia with peribulbar anaesthesia in manual small incision cataract surgery

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Abstract :

Ophthalmic surgery has been performed under a wide range of anaesthetic techniques. The type of anaesthesia for each ophthalmic surgery depends on many factors like patient co-operation, the nature of the surgery and surgeon's preference. Peribulbar block involves injections above and below the orbit, with local anaesthetic deposited in the orbicularis oculi muscle. This technique blocks the ciliary nerves, as well as CN III and VI, but does not block the optic nerve (CN II). sub-tenon's block has become the most common technique of orbital regional anaesthesia in many centres. In this technique, forceps are used to elevate the conjunctiva and tenon's capsule and the needle is directed posteriorly, and anaesthetic is injected in the subtenon's space between the tenon's capsule and sclera in the equatorial region of the superotemporal quadrant of the eyeball. This results in blocking of the ciliary nerves.

Keywords : Manual Small Incision Cataract Surgery (MSICS), Subtenon anaesthesia, Peribulbar anaesthesia.

Introduction : Blindness due to cataract presents an enormous problem in India not only in terms of human morbidity but also in terms of economic loss and social burden. Manual small incision cataract surgery offers the advantages of sutureless cataract surgery as a low cost alternative to phacoemulsification with added advantage of having wider applicability, safety, easier learning curve,and machine independence. Local anesthesia involves the blockage of a nerve supplying a given part of the body by infiltration of the area around the nerve with a local anesthetic agent[1].

Regional anesthesia has been popularized in ophthalmic surgery because of its high success rate and a wide margin of safety. It ensures quicker patient recovery thereby enabling day-surgery cases and reduction in cost of surgery[2].

Retrobulbar anaesthesia was commonly used for cataract extraction. Peribulbar anaesthesia replaced retrobulbar anaesthesia because of serious complications. Even with a two injection technique peribulbar anaesthesia has sometimes an excessive rate of imperfect blockage and pain.Pain during injection of local anesthetic solution is common and this is partly explained by the direct tissue irritation caused by injecting an acidic solution, Lidocaine hydrochloride (L-HCL)[3].

In this context subtenon anaesthesia is gaining popularity providing a quicker onset of anaesthesia, better akinesia, more consistency in effectiveness and better patient compliance.

Aim :

1) To compare the efficacy of subtenon anaesthesia and peribulbar anaesthesia in MSICS with respect to intra operative pain, akinesia, lid movements.

2) To compare the complications of subtenon and peribulbar anaesthesia.

Materials and methods : A prospective study of 100 patients who underwent MSICS was done, of which 50 of them underwent surgery by subtenon anaesthesia and 50 by peribulbar anaesthesia.

The efficacy and safety of two methods of anaesthesia in MSICS with respect to intraoperative pain, akinesia, lid movements and complications were compared.

Inclusion criteria

1. Senile cataract cases with visual acuity less than 6/36.

Exclusion criteria

1. Signs of chronic ocular inflammation –uveitis.
2. History of ocular trauma.
3. Subluxated lens.
4. Lens induced glaucoma.
5. Diabetes mellitus.
6. Hypertension

Result : The percentage of patients with grade 0 pain in subtenon group was 70 % as compared to 30% in peribulbar group. None of the patients experienced grade 4 pain in subtenon group but 4% of peribulbar group patients experienced grade 4 pain. The percentage of patients with grade 0 akinesia in subtenon group was 0% as compared to 62% in peribulbar group. Grade 0 lid movements were experienced by 70% in subtenon group and 88% in peribulbar group. 61% of subtenon group had grade 0 chemosis and 64% in peribulbar group had the same. 44% of subtenon group and 64% of peribulbar group had grade 0 subconjuctival haemorrhage.

Table no. 1: Comparing grading of pain

Grading of pain	Subtenon group	Peribulbar group
No pain	70%	30%
Mild Sensation	22%	44%
Mild Pain	6%	16%
Moderate Pain	2%	6%
Intense Pain	0%	4%

Table no. 2: Comparing grading of akinesia

Grading of pain	Subtenon group	Peribulbar group
No ocular movement	0%	62%
Very Mild Ocular Movement	2%	16%
Mild Ocular Movement	8%	16%
Moderate Ocular Movement	8%	4%
Severe Ocular Movement	42%	2%
Very Severe Ocular Movement	40%	0%

Discussion : Stan. J. Romer, done study on 10^9 patients who were listed for cataract extractions. The administration of subtenon's block was painless for 99.1% of the patients. 97.3% reported no pain during surgery. There was no akinesia when assessed just after the completion of block and akinesia was limited when assessed after surgery. Chemosis and conjunctival haemmorhage were frequent but caused no intra operative problem[4].

In the study done by Jacques Ripart, subtenon anaesthesia provided a quicker onset of anaesthesia, a better akinesia score and a lower rate of incomplete blockade necessitating reinjection than peribulbar anaesthesia. Peribulbar anaesthesia began to wear off during surgery, whereas subtenon anaesthesia did not. Subtenon anaesthesia provided a more constantly effective block than did with peribulbar anaesthesia with shorter time to onset of blockade, better maximal akinesia and no need of supplement injection. Subtenon anaesthesia is a suitable alternative to peribulbar anaesthesia[5].

In the study done by K.S. Canavan, subtenon block is perceived as having an acceptable safety profile because a sharp needle is not placed within the orbital cavity. Chemosis in subtenon anaesthesia is attributable to anterior leak of injectate but its extent can be much greater if the solution is administered incorrectly into either the anterior compartment of the subtenon's space, or the subconjunctival space. Subconjunctival haemorrhage is usually localized and infrequently associated with significant consequences[6].

In the study done by ParkarTasneem, Subtenon anaesthesia was more comfortable for the patient at the time of anaesthetic administration. Subtenon technique for administration of anaesthesia during MSICS is as safe as the peribulbar technique giving equally good analgesia during and after surgery[7].

According to the study done by C.M. Kumar, Subtenon block eliminates the risk of sharp needle techniques, provides reliable anaesthesia and has the potential for further supplementation for

prolonged anaesthesia and postoperative pain relief[8].

J. D. Steven's described a new technique of local anaesthetic administration used for 50 patients undergoing cataract extraction. This technique is a single quadrant inferior nasal subtenon's approach with a blunt cannula[9]. Hideharu Fukasaku developed sub tenons pinpoint anaesthesia to overcome the potential problems inherent in retrobulbar anaesthesia. The technique of sub tenon's pinpoint anaesthesia is both topical and injection technique[10].

In conclusion, Intra operative pain was dramatically lower in subtenon group of patients with significantly fewer patients experiencing unacceptable levels of pain. Subtenon group of patients had good analgesia but surgeons had to operate under incomplete akinesia. Peribulbar anaesthesia had an upper hand in terms of intra operative akinesia when compared with subtenon anaesthesia Intra operative lid movements were slightly more in subtenon group of patients. The incidence of chemosis was almost comparable in both the groups. Subconjunctival haemorrhage was more in subtenongroup as compared with patients in peribulbar group.

Conclusion : Intra operative pain was dramatically lower in subtenon group of patients with significantly fewer patients experiencing unacceptable levels of pain. Peribulbar anaesthesia had an upper hand in terms of intra operative akinesia when compared with subtenon anaesthesia. Intra operative lid movements were slightly more in subtenon group of patients. The incidence of chemosis was almost comparable in both the groups. Subconjunctival haemorrhage was more in subtenon group as compared with patients in peribulbar group.

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