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Anesthetic block for cataract surgery

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Abstract

Worldwide, cataracts are one of the leading causes of blindness. Local anesthesia is often used during cataract surgery unless there are medical reasons not to. To achieve local anesthesia, a specific area of the body's nerves are occluded. The procedure entails injecting a local anesthetic into the tissue around the nerve. In the eye, the retrobulbar and peribulbar approaches are the two most common. The effectiveness and safety of the peribulbar method compared to the retrobulbar block in administering anesthesia for cataract surgery is a matter of some contention. Examining the differences between peribulbar (PB) and retrobulbar (RB) anaesthesia in terms of pain levels, patient acceptance, and ocular and systemic consequences was the goal of this study. Clinical studies that compared peribulbar and retrobulbar anesthesia for cataract surgery were included in our meta-analysis. Neither retrobulbar nor peribulbar anesthesia was associated with a different level of perceived pain during surgery. Both had a significant impact. Concerning total akinesia and the need of further injections of local anaesthetic, there was no indication of any change. Relative risk (RR) 2.11, 95% CI 1.46 to 3.05 for conjunctival chemosis and RR 0.36, 95% CI 0.15 to 0.88 for lid haematoma after peribulbar block and retrobulbar block, respectively. Only one patient, who had a retrobulbar block, had the rare occurrence of retrobulbar hemorrhage. Anaesthesia, akinesia, patient acceptance, injection requirements, and the risk of serious complications are all closely related to whether a peribulbar or retrobulbar block is used during surgery. Both varieties of blocks were associated with a low incidence of serious local or systemic problems.

Key words: *Anesthesia, Cataracts, Eye.*

The crystalline lens of the eye becomes opaque due to a cataract. In 1999, almost 20 million people were thought to be blind due to cataracts, making them the leading cause of blindness globally (Foster 1999). The most prevalent kind of cataract is associated with aging. Trauma,

inflammation inside the eye, and genetics are some potential reasons. Everyone is focusing on getting surgery for those who need it since there are no proven methods to avoid age-related cataracts. The cataractous lens is surgically removed during cataract surgery to restore vision. Both intracapsular and extracapsular cataract extraction include removing the lens in its whole or only a portion of it, leaving the posterior capsule intact. An artificial intraocular lens may be inserted using the extracapsular method.

Local anesthesia is often used during cataract surgery unless there are medical reasons not to. By injecting a local anesthetic into the region around a nerve, local anesthesia blocks the nerve from providing sensation to a specific location of the body. The infiltration of the periocular region blocks all the nerves surrounding the globe in the eye. Local anesthetic that is painless, quick, safe, and successful is the aim (Hamilton 1988). When it comes to producing anesthesia for cataract surgery, there are many methods for administering local injections. Both the retrobulbar and peribulbar methods are used. Although retrobulbar injection seems to be more often used, peribulbar anesthesia is gaining popularity due to claims that it offers the same level of akinesia and anaesthesia (Hessemer 1994). While the use of sub-tenons and topical or intracameral anesthesia is becoming more common during cataract surgery, peribulbar or retrobulbar anesthesia is still preferred in certain regions (Hansen 1998; Leaming 1999).

whether you're having cataract surgery, you may want to know whether the peribulbar approach or retrobulbar block offers better and safer anesthesia. The blind insertion of a needle into the intraconal area, which is a known risk of the retrobulbar technique, may cause substantial ocular injury. The ocular space is defined by the extraocular muscles and houses the adnexa and the majority of the eye's nerves. A scleral perforation, anesthetic injection into the perioptic meningeal area, or oculocardiac reflex activation are all potential complications. The administration of lesser amounts of anesthetic drug via this route may result in faster onset of analgesia and akinesia, albeit (Ali-Melkkila 1992). Peribulbar anesthesia, similar to the retrobulbar method, is meant to keep the eyes still and sedated during surgery; nevertheless, some argue that it is safer than the latter (Davis 1989; Murdoch 1990; Whitsett 1990). Although a peribulbar block is linked with a decreased risk of major problems, it may take more time for anesthesia to kick in and more medication to cover the area. According to Davis (1994), there is a possibility that both methods might lead to problems that could endanger sight or perhaps life. The purpose of this meta-analysis was to compile the most up-to-date information on the effects of peribulbar and retrobulbar anesthesia on cataract surgery. The results of earlier evaluations could not be trusted since they failed to take into consideration potential biases in the clinical studies. While Friedman et al. conducted a comprehensive literature evaluation to determine if regional anesthesia was beneficial for cataract surgery, their search only included studies conducted up to 1999 and they failed to evaluate whether further injections were necessary (Friedman 2001a; Friedman 2001b).

Methods:

Our meta-analysis of cataract surgery RCTs included both peribulbar and retrobulbar blocks.

Participants' categories Patients having cataract surgery were a part of this study.

Different kinds of treatments: For cataract surgery, we included peribulbar block to retrobulbar block studies. According to Ali-Melkkila (1993) and Davis (1989), the peribulbar block encompasses all of its variants.

Results and discussions:

Atharikar (1991), Weiss (1989), and Wong (1993) were the three trials that evaluated the pain score. Using this pain score, we may gauge how much discomfort the patient had during

cataract surgery. Based on a scale from 0 (inadequate anesthesia for continuing operation), + (not ideal but sufficient), ++ (not ideal but more than adequate), and +++ (complete anaesthesia), Athanikar (1991) classified globe anaesthesia. According to Weiss (1989), there was a four-point scale for globe anesthesia: 4 for entire anesthesia, 3 for more than sufficient but not quite total, 2 for not ideal but just enough to continue, and 1 for inadequate to proceed. Glob anesthesia was ranked by Wong (1993) as either ideal, not optimal but able to continue, or not optimal and impossible to proceed.

There were five studies that evaluated globe akinesia: Ali-Melkkila (1992), Ali-Melkkila (1993), Athanikar (1991), Weiss (1989), and Wong (1993). Complete immobility of the eyeball (grade 'A' block), little eyeball movement (grade 'B' block), and movement requiring further injections (grade 'C' block) were the criteria used to classify the eyeball block. The summary statistics for globe akinesia were based on the counts for Grade 'A' block, which represents full akinesia. The reason for this is because ordinal variables are not supported by RevMan 5.0.

Weiss (1989), Ali-Melkkila (1992), Ali-Melkkila (1993), and Wong (1993) were the four studies that evaluated the need of further injections.

All trials except Weiss 1989 documented complications arising from the two anesthetic procedures.

The studies conducted by Ali-Melkkila in 1992 and Wong in 1993 documented the level of patient acceptance for the two therapies. In order to determine a patient's acceptance, Ali-Melkkila 1992 inquired as to whether the subject chose general anesthesia over local anesthesia, while Wong 1993 sought to know whether the subject would undergo the same block procedure again.

In one experiment, one out of seventy-one patients (0.3%) in the retrobulbar group had local retrobulbar hemorrhage (Athanikar 1991). The peribulbar group did not have any retrobulbar hemorrhage reports.

Four trials (Athanikar 1991; Ali-Melkkila 1992; Ali-Melkkila 1993; Wong 1993) confirmed conjunctival chemosis. Conjunctival chemosis was a concern for 17.4% of PBs (98/563 cases) and 7.1% of RBs (34/479 cases). The blocks were anesthetized with an average amount of 8.3 ml and 4.7 ml, respectively. Based on the fixed-effect model, the relative risk was 2.11 (95% CI 1.46 to 3.05; $P < 0.00001$). Substantial heterogeneity (12=31.9%) did not occur. In comparison to RB, PB increased the likelihood of conjunctival chemosis. Reasons for this might include injecting a higher amount of anesthetic and bringing the anaesthetic agent into the orbit more anteriorly.

As a local complication, lid haematoma was described in one experiment (Ali-Melkkila 1993). A lid haematoma was possible in 2.7% of PBs (8/300) and 7.3% of RBs (11/150). ($P = 0.03$) The rate was much greater in RB compared to PB.

Nine patients (1.1%) in the peribulbar group and nine (1.3%) in the retrobulbar group had persistent ptosis, which is defined as the amount of reduction in the lid fissure drop at 90 days following surgery when it is equal to or higher than 2 mm. A ptosis risk ratio of 1.06 (95% CI 0.43 to 2.60; $P = 0.9$) was not different. This result was only documented in a single research (Feibel 1993).

In all of the studies, there were no reports of serious systemic side effects.

How sedation works Both the sedation group and the non-sedation group showed no differences in pain management or globe akinesia. Every subject was given alfentanil 15 minutes before to anesthesia in the Ali-Melkkila study of 1992, but in the Weiss study of 1989, 0.5 to 1 mg of intravenous idazolam was given before anesthesia.

Regarding pain management (globe anesthesia), the current research did not uncover any disparity between PB and RB (WMD - 0.03, 95% CI -0.17 to 0.11). The two methods found comparable rates (RR1.04, 95% CI0.89 to1.22) for globe akinesia grade 'A' block, which is a complete block without eye ball movement. Consistent with previous research, this study indicated that PB and RB were equally effective in reducing postoperative pain and the incidence of complete akinesia after cataract surgery (Friedman 2001a).

LITERATURE

1. Agrawal K, Saxena RC, Nath R. Saxena S. Local anesthesia by peribulbar block for cataract extraction in an eye relief camp. *Online Journal of Current Clinical Trials* 1993;19:Doc No 40.
2. Alhassan MB, Kyari F, Ejere HOD. Peribulbar versus retrobulbar anaesthesia for cataract surgery. *Cochrane Database of Systematic Reviews* 2008, Issue 3. [DOI: 10.1002/14651858.CD004083.pub2] [PubMed] [CrossRef] [Google Scholar]
3. Ali Melkkila TM, Virkkila M, Jyrkkio H. Regional anesthesia for cataract surgery: comparison of retrobulbar and peribulbar techniques. *Indian Journal of Ophthalmology* 1992;39:48-9.
4. Ali-Melkkila T, Markku V, Keino K, Palve H. Regional anaesthesia for cataract surgery: comparison of three techniques [see comments]. *British Journal of Ophthalmology* 1993;77(12):771-3.
5. Asensio SVM, Sanchez BJ, Martin S, Merchan L. Comparison of retrobulbar and peribulbar anaesthesia for cataract surgery. *Archivos de la Sociedad Española de Oftalmología* 1994;66:171-4.
6. Athanikar NS, Agrawal VB. One point low volume peribulbar anaesthesia versus retrobulbar anaesthesia a prospective clinical trial. *Indian Journal of Ophthalmology* 1991;39(2):48-9.
7. Barker J P, Robinson PN, Vafidis GC, Hart GR, Hall GM. Local anaesthesia for cataract surgery. *Lancet* 1989;1:393. [MEDLINE:]
8. Davis DB 2nd, Mandel MR. Efficacy and complication rate of 16,224 consecutive peribulbar blocks. A prospective multicentre study. *Journal of Cataract & Refractive Surgery* 1994;20(6):263.
9. Davis DB 2nd, Mandel MR. Posterior peribulbar anaesthesia: an alternative to retrobulbar anaesthesia. *Journal of Cataract and Refractive Surgery* 1986;12:182.
10. Davis DB 2nd, Mandel MR. Posterior peribulbar anaesthesia: an alternative to retrobulbar anaesthesia. *Indian Journal of Ophthalmology* 1989;37:59-61.

11. Edge KR, McClarty CP, Krige SJ, Rantalainan RR. Comparison of an extraconal block with a retrobulbar-facial block combination for ocular surgery. *South African Journal of Surgery* 1995;33(3):117-20.
12. Feibel RM, Custer PL, Gordon MO. Postcataract ptosis. A randomized, double-masked comparison of peribulbar and retrobulbar anesthesia. *Ophthalmology* 1993;100:660-5.
13. Foster A. Cataract -- a global perspective: output, outcome and outlay. *Eye* 1999;13:449-53.
14. Friedman DS, Bass EB, Lubomski LH, Fleisher LA, Kempen JH, Magaziner J, et al. Synthesis of the literature on the effectiveness of regional anesthesia for cataract surgery. *Ophthalmology* 2001;108(3):530-41.
15. Friedman SD, Bass EB, Lubomski LH, Flesher LA, Kempen JH, et al. The methodological quality of clinical trials on regional anesthesia for cataract surgery. *Opthalmology* 2001;108(3):530-41.
16. Hamilton RC, Gimble HV, Strunin L. Regional anaesthesia for 12,000 cataract extractions and lens implant procedures. *Canadian Journal of Anaesthesia* 1988;35:615-25.
17. Hansen TE. Current trend in cataract surgery in Denmark; 1998 survey. *Acta Ophthalmologica Scandinavica* 1999;77:685-9.
18. Hessemer V. Peribulbar anesthesia versus retrobulbar anesthesia with facial block. Techniques local anesthetics and additives, akinesia and sensory blockade, complications. *Klinische Monatsblätter für Augenheilkunde* 1994;204:75-89. [MEDLINE:]
19. Higgins JPT, Green S, editors. Cochrane Handbook for Systematic Reviews of Interventions Version 5.0.2 [updated September 2009]. *The Cochrane Collaboration, 2008. Available from www.cochrane-handbook.org*.
20. Jacobi PC, Dietlein TS, Jacobi FK. A comparative study of topical versus retrobulbar anesthesia in complicated cataract surgery. *Archives of Ophthalmology* 2000;118(8):1037-43.
21. Lavinsky J, Gus PI, Ehlers JA, Roehe D, Nora DB. Visual-evoked potentials: assessment of retrobulbar and peribulbar anesthesia. *Journal of Cataract and Refractive Surgery* 2000;26:1529-32.
22. Leaming DV. Practice styles and preferences of ASCRS members - 1998 survey. *Journal of Cataract and Refractive Surgery* 1999;25:851-9. The Nordic Cochrane Centre, The Cochrane Collaboration. Review Manager (RevMan). Version 5.0. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2007.
23. Li H, Li XE. Comparison of retrobulbar and periocular anesthesia for cataract surgery. *Journal of Henyang Medical College* 1996;24:49-51.

24. Meyer D, Hamilton RC, Loken RG, Bimbel HV. Effect of combined peribulbar and retrobulbar injection of large volume of anesthetic agents on the intraocular pressure. *Canadian Journal of Ophthalmology* 1992;27:230-2.
25. Murdoch I. Peribulbar versus retrobulbar anaesthesia. *Eye* 1990;4:445-9.
26. Ramsay AS, Ray Chaudhuri N, Dayan M, Walshaw D. Quantification of relative afferent pupillary defects induced by posterior sub-Tenon's, peribulbar, and retrobulbar anaesthetics. *British Journal of Ophthalmology* 2001;85:1445-6.
27. Ropo A, Ruusuvaara P Setala K. Visual evoked potentials after retrobulbar or periocular anaesthesia. *British Journal of Ophthalmology* 1992;76:541-4.
28. Sanders R, Ahmed S, Craig EW, Young JD. Comparison of catecholmine and pressor effects in peribulbar and retrobulbar anaesthesia in cataract surgery. *Eye* 1997;11:644-8. [MEDLINE:]
29. Sanford D K, Minoso y de Cal OE, Belyea DA. Response of intraocular pressure to retrobulbar and peribulbar anesthesia. *Ophthalmic Surgery and Lasers* 1998;29:815-7.
30. Saunders DC, Sturgess DA, Pemberton CJ, Morgan LH, Bourne A. Peribulbar and retrobulbar anesthesia with prilocaine: a comparison of two methods of local ocular anesthesia. *Ophthalmic Surgery* 1993;24(12):842-5.
31. Weiss JL, Deichman CB. A comparison of retrobulbar and periocular anesthesia for cataract surgery. *Archives of Ophthalmology* 1989;107:96-8.
32. Whitsett J C, Balyeat HD, McClure B. Comparison of one-injection-site peribulbar anesthesia and retrobulbar anesthesia. *Journal of Cataract & Refractive Surgery* 1990;16:527-8.
33. Wong HW, Koehrer E, Sutton HF. A modified retrobulbar block for eye surgery. *Canadian Journal of Anaesthesia (Journal Canadien d'Anesthésie)* 1993;40(6):547-53.