Levobupivacaine versus Bupivacaine in Peribulbar Block for Ophthalmic Surgeries: A Systematic Review and Meta-analysis

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INTRODUCTION

Peribulbar anesthesia plays a crucial role in ensuring patient comfort and safety during various eye surgeries.

While **bupivacaine has long been a reliable option**, **levobupivacaine is gaining attention for potentially reducing side effects, especially cardiotoxicity and systemic hypotension**, while maintaining effective blockade.

AIM

To compare the efficacy of levobupivacaine versus bupivacaine for peribulbar block in ophthalmic surgery, aiming to inform clinicians' decisions and enhance patient care.

METHOD

- A systematic review and meta-analysis were conducted as per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses **(PRISMA) guidelines**.
- Publications in **MEDLINE, EMBASE, EMCARE, CINAHL and the Cochrane Central Register of Controlled Trials (CENTRAL)** that compared levobupivacaine and bupivacaine for peribulbar block in ophthalmic surgery were screened for eligibility.
- **Inclusion Criteria:** All randomized control trials (RCTs) and observational studies comparing levobupivacaine versus bupivacaine in peribulbar block for ophthalmic surgery.
- **Exclusion Criteria:** Abstract only, conference literature, dissertation, Cases reports and single arm observational studies with no comparator, and studies not written in English.

RESULTS

8 included studies all of which are **RCTs** with a total sample size of **800 participants**

Figure 1 Prisma Flow Diagram: The PRISMA diagram details the search and selection processes applied during the overview.

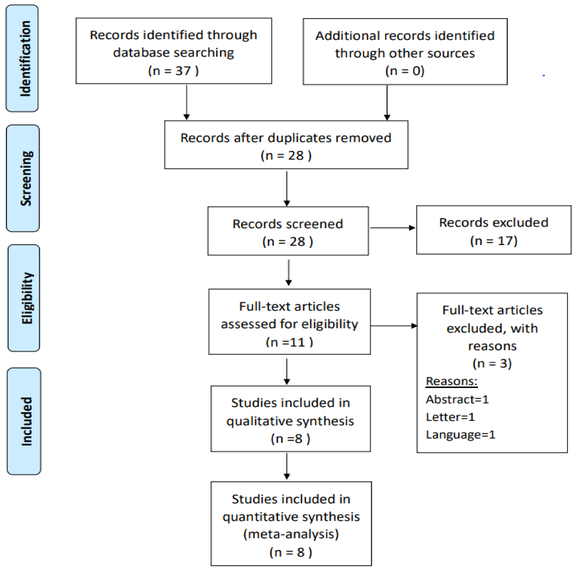
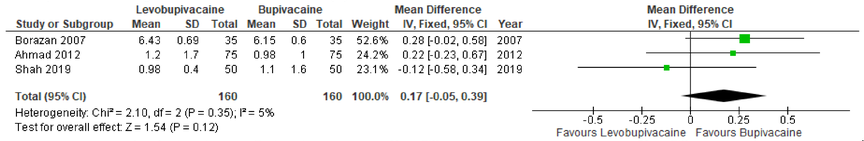


Figure 2 Forest plot for the odds ratio of levobupivacaine versus bupivacaine in a peribulbar block for ophthalmic surgeries - Akinesia Score at (a) 2 minutes (b) 10 minutes.



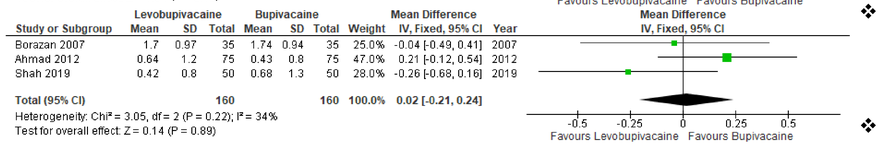


Figure 3: Forest plot for the odds ratio of levobupivacaine versus bupivacaine in a peribulbar block for ophthalmic surgeries – Time to onset (min).

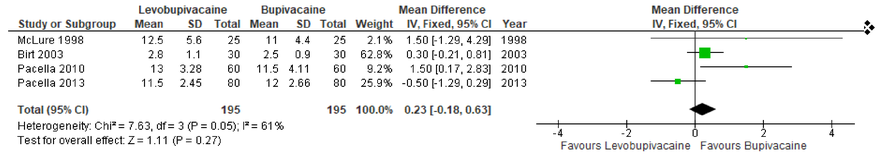
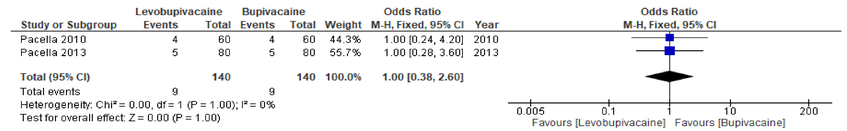


Figure 4: Forest plot for the odds ratio of levobupivacaine versus bupivacaine in a peribulbar block for ophthalmic surgeries - Moderate hypotension (<30% of baseline).



- **Akinesia Score**: No statistically significant difference was noted between levobupivacaine and bupivacaine groups at 2 minutes (MD = 0.17, CI = −0.05 to 0.39 , P = 0.12, I²=5%; Fig.2a) and 10 minutes post-injection (MD = 0.02, CI = −0.21 to 0.24, P = 0.89, I²=34%; Fig.2b)
- **Time to onset of anaesthetic effect:** No statistically significant difference was noted between levobupivacaine and bupivacaine groups (MD = 0.23, CI = −0.18 to 0.63, P = 0.27, I²=61%; Fig.3).
- **Systemic Hypotension:** No statistically significant difference was noted between levobupivacaine and bupivacaine groups (MD = 1.00, CI = 0.38 to 2.60, P = 1.00, I²=0%;Fig.4).
- **Verbal Pain Scales:** No statistically significant difference was noted between levobupivacaine and bupivacaine groups during the block (MD = 0.04, CI = -0.15 to 0.23, P = 0.66, I²= 0%), at the end of surgery (MD = -0.01, CI = -0.17 to 0.16, P = 0.94, I²=0%) or 4 hours post-operatively (MD = -0.01, CI = -0.10 to 0.07, P = 0.73, I²= 87%).
- **Post-operative Diplopia:** No statistically significant difference was noted between levobupivacaine and bupivacaine groups (MD = 0.62, CI = 0.31 to 1.23, P = 0.17,I²=0%).

CONCLUSION

This systematic review and meta-analysis, incorporating data from 8 studies involving 800 subjects, indicates that **levobupivacaine demonstrates comparable efficacy and side effect profile to bupivacaine** in the context of peribulbar block for ophthalmic surgery.

Future randomized studies should focus on comparing bupivacaine and levobupivacaine for peribulbar blocks with larger sample sizes **prioritizing critical aspects like onset time of adequate anesthesia for surgery and incidence of cardiovascular side effects.**

REFERENCES

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