Inferior Oblique Anterior Transposition versus Myectomy for Inferior Oblique Overaction: Systematic Review and Meta-Analysis

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Introduction:

Inferior oblique muscle overaction (IOAA) is characterized by the over-elevation of the eyeball in adduction[1]. It is a common ocular motility disorder and is reported in 70% of patients with esotropia and 30% of patients with exotropia[2]. Several studies have compared the effectiveness of anterior transposition (IOAT) and myectomy (IOM) for correcting IOAA[3-13], however there are no currently no meta-analyses comparing the outcomes of the two interventions. The current study is therefore the first in the literature amalgamating the data of these studies to compare the two interventions.

Aim:

To compare the outcomes of IOAT versus IOM in patients with primary IOAA or secondary IOOA to superior nerve palsy.

Methods:

- A systematic review and meta-analysis as per PRISMA guidelines. A search of electronic databases was conducted to identify all studies comparing the two interventions for patients with IOAA.
- Primary outcomes included elimination and improvement of IOAA, inferior oblique under-action and post-operative complications.
- Secondary outcomes included superior oblique function, improvement in the head tilt, effect on the contralateral eye, operation time and macular changes.
- Review Manager 5.3 software was used for data synthesis.

Results:

- Study Sample: Eleven studies enrolling 729 patients were identified (Figure 1).
- Primary Outcomes:
  - Elimination of IOAA:
    - In Figure 2, elimination of overaction was reported by 7 studies involving 622 patients, with no statistically significant difference between groups (OR=0.97, CI=0.23-4.14, P=0.97).
  - Improvement in IOAA:
    - No significant differences were found between the two procedures for reducing IOAA (Mean difference [MD] = -0.06), confidence interval [CI]=-0.35-0.23, P=0.68), as Figure 3 shows.
    - Residual overaction was also reported by 7 studies involving 668 patients, showing no statistical significance (OR = 0.71, CI=0.45-1.13, P=0.15), as shown in Figure 4.
- Post-operative complications:
  - No significant difference was found between the two interventions, including the development of anti-elevation syndrome, ocular haemorrhage and visual acuity.
- Secondary Outcomes:
  - No significant difference was noted regarding superior oblique function, improvement in head tilt, effect on the contralateral eye and macular changes. However, surgical time was significantly shorter in the IOM group.

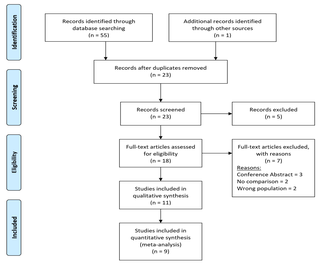


Figure 1. PRISMA flow diagram

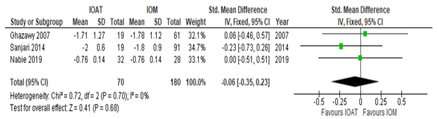


Figure 3: Forest plot of inferior oblique myectomy (IOM) versus anterior transposition (IOAT) for inferior oblique overaction (IOOA) – Reduction in inferior oblique overaction.

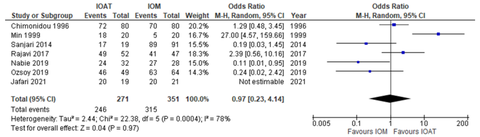


Figure 2: Forest plot of inferior oblique myectomy (IOM) versus anterior transposition (IOAT) for inferior oblique overaction (IOOA) – Elimination of inferior oblique overaction.

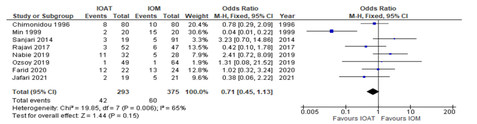


Figure 4: Forest plot of inferior oblique myectomy (IOM) versus anterior transposition (IOAT) for inferior oblique overaction (IOOA) – Residual inferior oblique overaction.

Conclusion:

Inferior oblique anterior transposition and myectomy are both effective surgical procedures in management of IOAA as they produced comparable results in the outcomes. However, IOM was associated with significantly shorter surgical time. The authors recommend further and larger studies to be conducted to further assess the results of this study.

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