

The Impact of Prophylactic Glucocorticoid Treatment on Hypocalcemia Following Thyroid Surgery: A GRADE-Assessed Systematic Review and Updated Meta-Analysis

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Background

Post-thyroidectomy hypocalcemia is common (parathyroid removal, devascularization, inflammation and edema). It delays recovery, prolongs hospitalization and raises costs. Perioperative glucocorticoids may reduce this risk through anti-inflammatory effects.

Aim: to test whether perioperative glucocorticoids reduce hypocalcemia and improve outcomes after thyroidectomy.

Methodology

- **Search** (PRISMA and Cochrane guidelines): PubMed, Cochrane Library, Embase, Scopus, Google Scholar, ScienceDirect, ClinicalTrials.gov.
- **Eligibility:** RCTs of perioperative glucocorticoids vs placebo or standard care in thyroidectomy.
- **Pooling:** RRs and MDs with 95% CIs; **quality:** Cochrane RoB 2 and GRADE.
- **Analyses:** I², subgroup, leave-one-out sensitivity, publication bias.

Results

10 RCTs, 1,491 patients (725 glucocorticoid, 766 control); hypocalcemia pooled from 9 trials (1,431 patients).

RR 0.46

54% lower hypocalcemia
95% CI 0.29–0.73
p=0.001; I²=37.6%

MD 0.11 mg/dL

Higher serum calcium
95% CI 0.00–0.22
p=0.043; I²=0%

MD 0.39 mg/dL

Higher phosphorus
95% CI 0.01–0.77
p=0.046

No difference

in PTH, voice dysfunction, operative time or dosing schedule

Figure 1. Change in postoperative serum calcium

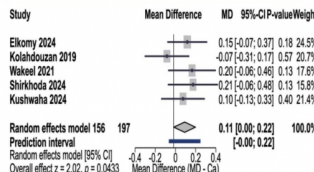
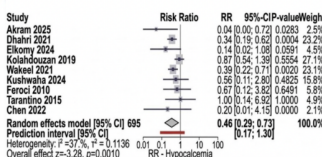


Figure 2. Postoperative hypocalcemia



Discussion

- Hypocalcemia fell by more than half, consistent with an anti-inflammatory effect; sensitivity analysis was stable.
- A single dose may match multidose regimens (no significant differences by schedule).
- **Limitation:** heterogeneity in steroid type, dose, timing and outcome definitions.

Conclusion

Perioperative glucocorticoids significantly reduce post-thyroidectomy hypocalcemia and improve postoperative serum calcium; a single dose may be as effective as multidose regimens.

Standardised, well-designed trials are needed to define the optimal regimen and confirm long-term efficacy and safety.

References

1. Edsall O, Antakia R, Laskar N, et al. Systematic review and meta-analysis of predictors of post-thyroidectomy hypocalcaemia. *British journal of Surgery*. 2014;101(4):307-320.
2. Wilkan A, et al. Incidence, risk factors, and management of post-thyroidectomy hypocalcemia: A systematic review and meta-analysis. *Annals of Translational Medicine*. 2025;13(2):118-128.
3. Rosato L, Avenia N, Bemanie P, et al. Complications of thyroid surgery: analysis of a multicentric study on 14,934 patients operated on in Italy. *World Journal of Surgery*. 2004;28(3):273-276.