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A Systematic Review and Meta Analysis of Teprotumumab Efficacy in Treating Chronic Thyroid Eye Disease (TED)

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 August 2023 and was last updated on 13 August 2023.

INTRODUCTION

Review question / Objective Determine the efficacy of teprotumumab at reducing proptosis in patients with chronic-stage thyroid eye disease.

Condition being studied Chronic thyroid eye disease.

METHODS

Search strategy To identify relevant studies, the search strategy involved querying five databases, Cochrane, Science Direct, PubMed, Google Scholar, and Embase. All studies in which the abstract or title included "teprotumumab" and "chronic thyroid eye disease" were examined.

Participant or population Participants with chronic stage thyroid eye disease over nine month duration as determined by clinicians conducting each primary study.

Intervention 8 infusion, 24 week protocol of teprotumumab (Tepezza).

Comparator Placebo when available, no other treatment to compare to.

Study designs to be included Clinical trials, case studies.

Eligibility criteria Clinical trial or case series, participants have chronic TED defined by duration over nine months from symptom onset, multiple participants completed treatment trials, patients on average received at least seven of the eight injections, and objective outcome measures were recorded at the start and after completion of the final infusion.

Information sources Google scholar, pubmed, sciencedirect, cochrane, embase.

Main outcome(s) Proptosis reduction (mm).

Quality assessment / Risk of bias analysis Sensitivity Analysis, Heterogeneity Analysis (Dersimonian and Laird Random Effects Model), GRADE criteria, QUADAS-2 framework.

Strategy of data synthesis The effect measures will include weighted and cumulative averages with incorporated standard deviations. Weighted averages will be determined according to the precision of each included study by 1/STD^2. Cumulative estimates will weight sample size of included studies proportionately. Between study variance and standard deviation will be calculated. To determine the precision of the estimates, standard error and 95% confidence intervals will be calculated using both the cumulative and weighted averages. One-tailed T-tests will be employed for statistical significance testing.

Subgroup analysis There is not sufficient volume of studies and participants for subgroup analysis.

Sensitivity analysis Sensitivity analysis will be performed by selectively removing each study from the pool one by one and recalculating cumulative and weighted means, variance, standard deviation, standard error, and 95% confidence intervals. By calculating how much each of these values deviates from the overall synthesis, the sensitivity of each included study can be determined.

Country(ies) involved United States.

Keywords Thyroid Eye Disease, Teprotumumab, Proptosis, Chronic.

Contributions of each author
Author 1 - Nicholas Householder.
Author 2 - Coby Ray.