INPLASY PROTOCOL

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None declared.

Appropriate dosing of sugammadex for reversal of rocuronium-/vecuronium-induced muscle relaxation in morbidly obese patients: a meta-analysis of randomized controlled trials

Liao, JQ[1]; Shih, D[2]; Lin, TY[3]; Lee, M[4]; Lu, CW[5].

Review question / Objective: **To conduct a systematic review and meta-analysis of randomized controlled trials (RCTs) to compare the effect of lower-dose sugammadex using IBW or CBW as dosing scalars, with that of standard-dose sugammadex based on TBW, on reversal time, defined as time to recovery of train of four ratio (TOFR) ≥ 0.9, among morbidly obese people after moderate or deep NMB with either rocuronium or vecuronium.**
Eligibility criteria: **We included only randomized controlled trials (RCTs) that compared TBW with other dosing scalars for sugammadex. Studies not published in full text articles or in languages other than English were excluded. Trials that included patients above 18 years of age and BMI more than or equal to 40 who underwent general anaesthesia with any degree of NMB induced by either rocuronium or vecuronium. Trials that evaluated TBW and other dosing scalars for sugammadex were included. We included trials that compared TBW with any other dosing scalars for sugammadex. Trials that did not include dosing based on TBW as one arm in the comparison were excluded.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 April 2022 and was last updated on 21 April 2022 (registration number INPLASY202240130).

INTRODUCTION

Review question / Objective: **To conduct a systematic review and meta-analysis of randomized controlled trials (RCTs) to compare the effect of lower-dose sugammadex using IBW or CBW as dosing scalars, with that of standard-dose sugammadex based on TBW, on reversal time, defined as time to recovery of train of four ratio (TOFR) ≥ 0.9, among morbidly obese people after moderate or deep NMB with either rocuronium or vecuronium.**

Condition being studied: **Morbidly obese adults undergoing general anesthesia with neuromuscular blockade (NMB) induced by**

either rocuronium or vecuronium, and the NMB was reversed with sugammadex.

METHODS

Participant or population: Morbid obese adults undergoing surgery with neuromuscular blockade induced by rocuronium or vecuronium.

Intervention: Sugammadex, dosed by ideal body weight, or corrected body weight.

Comparator: Sugammadex, dosed by actual body weight.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: We included only randomized controlled trials (RCTs) that compared TBW with other dosing scalars for sugammadex. Studies not published in full text articles or in languages other than English were excluded. Trials that included patients above 18 years of age and BMI more than or equal to 40 who underwent general anaesthesia with any degree of NMB induced by either rocuronium or vecuronium. Trials that evaluated TBW and other dosing scalars for sugammadex were included. We included trials that compared TBW with any other dosing scalars for sugammadex. Trials that did not include dosing based on TBW as one arm in the comparison were excluded.

Information sources: PubMed, ClinicalTrials.gov, Cochrane Central Register of Controlled Trials, Google Scholar.

Main outcome(s): The primary outcome was the time to reach TOFR ≥ 0.9 from administration of sugammadex (reversal time). The secondary outcomes were the time to reach TOFR ≥ 0.7 from administration of sugammadex, rate of postoperative respiratory complications, and any adverse events (AEs) after administration of sugammadex.

Quality assessment / Risk of bias analysis: We used the Risk of Bias (RoB 2) tool for randomized controlled trials proposed by Sterne et al. to assess the different domains of bias.

Strategy of data synthesis: Meta-analyses were performed using the RevMan 5.4 software. Mean difference with SD was used to estimate the results between the active group and control group. The random-effects model was used to calculate the pooled estimate when 2 or more trials provided sufficient data for a given outcome. Statistical heterogeneity was assessed with I^2, where values of 30 – 60% and 50 – 90% were considered as moderate and substantial heterogeneity, respectively. Two-sided P-value < 0.05 was considered statistically significant. Publication bias was assessed by funnel plots when more than or equal to 10 studies were included in the meta-analysis.

Subgroup analysis: Nil.

Sensitivity analysis: Nil.

Language: Only articles published in English were included.

Country(ies) involved: Taiwan.

Keywords: sugammadex; morbid obesity; total body weight; ideal body weight; corrected body weight; lean body weight.

Dissemination plans: Publication in an international medical journal.

Contributions of each author:

Author 1 - Jian-Qiang Liao - JQL collaborated with Darrell Shih to complete searches in databases, screening of abstracts, retrieval and in-depth analysis of full texts, study selection, evaluation of risk of biases, and data abstraction. JQL composed the early manuscript drafts.
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Author 2 - Darrell Shih - DS collaborated with JQL to complete searches in databases, screening of abstracts, retrieval and in-depth analysis of full texts, study selection, evaluation of risk of biases, and data abstraction.

Author 3 - Tzu-Yu Lin - TYL started the study conceptualization and refined the methodology.
Author 4 - Meng Lee - Performed the statistical analyses and contributed to finalization of the manuscript.
Author 5 - Cheng-Wei Lu - Performed the statistical analyses and contributed to finalization of the manuscript.