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Impact of combined propranolol and oxytocin on the process and outcomes of labor: a meta-analysis of randomized controlled trials

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ADMINISTRATIVE INFORMATION

Support - None.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 September 2023 and was last updated on 30 September 2023.

INTRODUCTION

Review question / Objective This systematic review aims to assess the effects of combining propranolol with oxytocin on labor progression and outcomes.

Condition being studied This study focuses on the management of labor, specifically comparing the use of oxytocin alone with the combination of propranolol and oxytocin for labor induction and facilitation in pregnant women.

METHODS

Participant or population The study includes pregnant women with singleton pregnancies at full term and cephalic presentation.

Intervention The intervention group receives propranolol in combination with oxytocin.

Comparator The control group is administered only oxytocin.

Study designs to be included Randomized controlled trials (RCTs).

Eligibility criteria Pregnant women.

Information sources VIP, CNKI, China Biomedical Literature Database, Wanfang, Embase, PubMed, and the Cochrane Library`.

Main outcome(s) The primary outcome measures include the duration of the latent phase, rate of neonatal intensive care unit (NICU) admissions, duration of the active phase on day 1, 5-minute Apgar score, and the rate of Cesarean section.

Quality assessment / Risk of bias analysis Two independent authors conducted risk of bias assessments for the included studies, with any discrepancies resolved through discussion or consultation with a third author. The Cochrane Handbook for Systematic Reviews of Interventions 5.3 guidelines were used to evaluate the quality of the included randomized controlled trials (RCTs). This assessment considered random sequence generation, allocation concealment, blinding of participants, personnel, and outcome assessors, handling of incomplete outcome data, selective reporting, and other potential biases, with each item classified as low risk, unclear, or high risk.

Strategy of data synthesis Mean differences (MD) were used as effect measures for continuous variables, while relative risks (RR) were employed for dichotomous variables. A 95% confidence interval (CI) was provided for each effect measure. Heterogeneity among study results was analyzed using the $\chi 2$ test, and I2 quantified the degree of heterogeneity. In the absence of significant statistical heterogeneity ($P > 0.10$, $I2 \leq 50\%$), a fixed-effects model was used for meta-analysis. In cases of clinical heterogeneity, a random-effects model was applied following exclusion of sources of heterogeneity. Sensitivity analysis involved removing one study at a time to assess its impact on the combined effect. When the number of included articles for a specific research indicator was ≥ 10, publication bias was assessed through funnel plots.

Subgroup analysis Subgroup analysis was conducted for studies exhibiting substantial heterogeneity.

Sensitivity analysis Sensitivity analysis was performed by systematically excluding individual studies to evaluate their impact on the overall results for each outcome indicator.

Country(ies) involved China.

Keywords Propranolol; Oxytocin; Labor; Meta-analysis.

Contributions of each author
Author 1 - Xia Liu.
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Author 3 - Bo Chen.