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The Efficacy and Safety of Prophylactic Agents in the Prevention of Retinopathy of Prematurity: A Systematic Review and Meta-analysis

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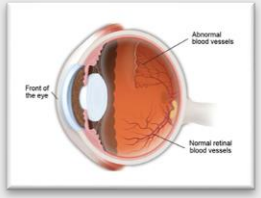
Background:

Retinopathy of prematurity (ROP) is one of the leading causes of childhood blindness. Multiple agents have been investigated for ROP prevention. **This study aimed to assess the efficacy and safety of lipids, vitamin A, and propranolol in preventing the incidence of ROP and severe ROP.**



Results:

Characteristics of included studies

Number of studies: 8 RCTs
Total number of participants: 1101
Mean gestational age (range): 25- 30.9 weeks
Study arms: 206 (18.7%) received lipids, 479 (43.5%) received vitamin A, and 416 (37.8%) received propranolol.

Risk of bias assessment (*fig.2*):

Low risk of bias: 4 RCTs
Some concerns: 3 RCTs
High risk of bias: 1 RCT

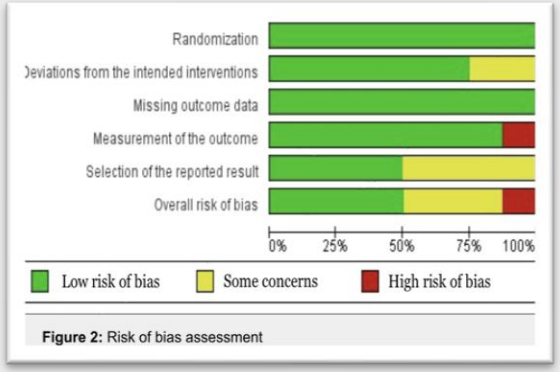


Figure 2: Risk of bias assessment

Meta-analysis:

-	Effect size	95% CI	P-value	I^2	GRADE
Outcomes reported as **Relative risk**					
Severe ROP	0.63	0.46-0.86	**0.004**	6%	Low
ROP of any stage	0.83	0.69-1.00	0.05	0%	Moderate
ROP stage 1	1.13	0.72-1.79	0.25	27%	Low
ROP stage 2	1.04	0.54-2.02	0.9	6%	Low
Adverse events	0.83	0.59-1.17	0.37	0%	Moderate
Mortality	0.93	0.67-1.30	0.38	6%	Moderate

Methods:

This study was carried out following a pre-specified protocol and conformed with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist. **PROSPERO ID: CRD42022344800**

Eligibility criteria (PICO):

Population: Preterm infants with a gestational age <32 weeks and a birthweight <1500 grams.
Intervention: Lipids, vitamin A, or propranolol.
Comparison: Placebo.
Outcomes: ROP of any stage, ROP stage 1, ROP stage 2, severe ROP (i.e., ROP stage 3-5, prethreshold ROP type 1, or ROP requiring treatment), adverse events, and mortality.
Included studies: Randomized controlled trials (RCT) in 3 major databases.

Data analysis:

Meta-analysis: Random-effects model.
Heterogeneity: *I*^2 and P-value of Chi*i*^2 test for heterogeneity.
Significance level: 95% with a P-value < 0.05 threshold.
Subgroup analysis: based on received intervention.
Quality assessment: Revised Cochrane Risk of Bias Tool
Certainty of evidence: GRADE criteria

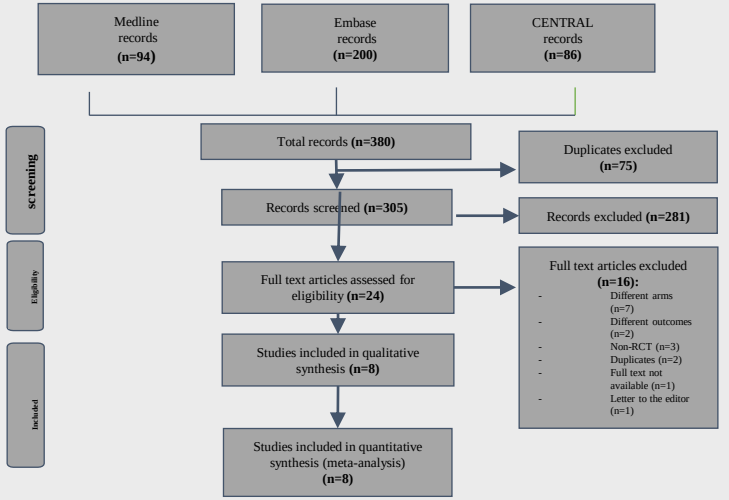


Figure 1: Study flow diagram

Conclusion:

The overall use of interventions, particularly lipids, was associated with **a significant reduction in the incidence of severe** ROP in comparison to control group.

References: