Meta-Analysis

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# The utilization of hyperbaric oxygenation therapy in hypospadias repair: a systematic review and meta-analysis

Michael E Chua[1,2,3], Justin Jin Kyu Kim[4], Jessica M Ming[5], Mark Jason De Jesus[6], Manuel C See 4th[6], Darius J Bagli[4], Mandy Rickard[4], Martin A Koyle[4], Armando J Lorenzo[4]
Affiliations expand

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## Abstract

**Introduction:** This study aimed to evaluate the efficacy and safety of Hyperbaric Oxygen Therapy (HBOT) use in hypospadias repair through systematic review and meta-analysis of comparative studies.

**Methods:** A systematic literature search was performed in May 2021. Comparative studies assessing the surgical outcome of hypospadias repair between control versus HBOT utilization were identified and evaluated according to Cochrane collaboration recommendations. The assessed outcome includes hypospadias repair failures and graft failure for staged repair using a buccal graft. Relative risk with corresponding 95% confidence intervals (CI) were extrapolated. A random-effect model was used to generate pooled effect estimates. Heterogeneity and inter-study variability were assessed using Chi-square and I-square. Subgroup analysis was performed according to primary repair versus redo-hypospadias with buccal graft. PROSPERO registration (CRD42021251423).

**Results:** Five comparative studies with 576 cases (301 HBOT versus 275 controls) were included. Overall pooled effect estimates showed that the HBOT group has significantly lesser hypospadias repair failure (RR 0.52, 95%CI 0.37, 0.72). Subgroup analysis on the use of HBOT for graft take showed lesser graft failure compared to the control group

(RR 0.20, 95% CI 0.05, 0.75), while the use of HBOT for primary and redo single staged hypospadias repair showed lesser complication rate (RR 0.56, 95%CI 0.40, 0.78). Based on ROBINS-I assessment, all included comparative studies are determined to be of serious risk of bias mainly due to presence of confounding.

**Conclusion:** The currently available low-quality of evidence suggests that compared to control groups, HBOT as an adjunctive intervention to complicated hypospadias repair was able to reduce surgical outcome failure and graft failure rates.