

## Hemoglobin Concentration and Pregnancy Outcomes:

### A Systematic Review and Meta-Analysis

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#### Abstract

**Background:** We conducted a systematic review and meta-analysis of hemoglobin effect on the pregnancy outcomes.

**Method:** We searched MEDLINE and SCOPUS from January 1, 1990 to April 10, 2011. Observational studies addressing association between hemoglobin and adverse pregnancy outcomes were selected. Two reviewers independently extracted data. A mixed logistic regression was applied to assess the effects of hemoglobin on preterm birth, low birth weight, and small for gestational age.

**Results:** Seventeen studies were included in poolings. Hemoglobin below 11 g/dL was, respectively, 1.10 (95% CI: 1.02–1.19), 1.17 (95% CI: 1.03–1.32), and 1.14 (95% CI: 1.05–1.24) times higher risk of preterm birth, low birth weight, and small for gestational age than normal hemoglobin in the first trimester. In the third trimester, hemoglobin below 11 g/dL was 1.30 (95% CI: 1.08–1.58) times higher risk of low birth weight. Hemoglobin above 14 g/dL in third trimester decreased the risk of preterm term with ORs of 0.50 (95% CI: 0.26–0.97), but it might be affected by publication bias.

**Conclusion:** Our review suggests that hemoglobin below 11 g/dL increases the risk of preterm birth, low birth weight, and small gestational age in the first trimester and the risk of low birth weight in the third trimester.

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