Effect of Multiple Micronutrient versus Iron-Folate Supplementation during Pregnancy on Intrauterine Growth

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Low birthweight (LBW) and small for gestational age (SGA) remain significant public health problems despite ongoing efforts to improve maternal and child health. Several intervention trials have demonstrated the benefits of balanced protein-energy supplements during pregnancy especially among undernourished women, but this approach remains both logistically and economically challenging in resource-poor settings. Diets of pregnant women in many developing countries are also inadequate in several micronutrients, which may affect intrauterine growth [1]. Prenatal iron-folate (IFA) supplementation has been shown to reduce the risk of LBW under controlled conditions, but problems of distribution and compliance remain [2]. It is in this context that several studies were undertaken to examine the potential benefit of providing supplements containing several micronutrients in addition to iron and folic acid [3–4].

This review evaluates the effects of prenatal multiple micronutrient (MM) supplementation (≥5 micronutrients) on intrauterine growth. The primary outcome measures were birthweight, LBW (<2,500 g) and SGA. Meta-analyses were performed by pooling results, and sub-analyses by timing of intervention and amount of iron were also done. We identified publications from 16 randomized controlled trials through PubMed and EMBASE database searches and examination of reviews. Prenatal MM supplementation significantly reduced the incidence of LBW (RR: 0.86; 95% CI: 0.81–0.92) and SGA (RR: 0.83; 95% CI: 0.73–0.95) compared to IFA; mean birthweight was also significantly higher (weighted mean difference, WMD: 54.5 g; 95% CI: 45.4–63.5 g) with borderline increases in gestational age (WMD = 0.07 weeks; 95% CI: 0.00–0.14 weeks). MM supplementation was associated with larger decreases in the risk of LBW and SGA in the subgroup of trials that used supplements containing 60 mg of iron, but these estimates were not statistically significantly different from
those for trials that used 30 mg iron. There were no significant differences in the overall risk of preterm birth, still birth, neonatal mortality and maternal anemia, but the risk of neonatal death however was significantly higher for the MM group (RR: 1.38; 95% CI: 1.05–1.81) in the subgroup of trials that began supplementation after the first trimester. The reasons for the increased risk are unclear.

In conclusion, prenatal MM supplementation improved intrauterine growth under controlled settings, but the increased risk of neonatal death among those who began the intervention after the first trimester calls for caution before recommending MM supplements in settings where prenatal care is not started early. Efforts to strengthen existing programs that provide IFA supplements and support for strategies that improve maternal nutrition before and during early gestation are needed to promote healthy growth and development for the next generation.

References