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Pooled findings from the LIFE-Moms randomized trials: where do we go from here?

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Both entering pregnancy with overweight or obesity and exceeding Institute of Medicine (IOM) gestational weight gain guidelines are strongly associated with short- and long-term maternal/child morbidity (1, 2). While gestational weight gain can be modestly altered through intervention (3), existing data suggest that a substantial reduction in gestational weight gain is unlikely to be achievable in women with overweight or obesity via current interventions addressing diet, physical activity, or both (4, 5). To overcome this evidence gap, the NIH created the Lifestyle Interventions for Expectant Moms (LIFE-Moms) consortium, a group of seven independent but collaborating randomized clinical trials whose shared goal was to identify effective interventions for reducing gestational weight gain in women with overweight or obesity (6).

In this month's *Obesity*, Peaceman and colleagues report pooled findings from the LIFE-Moms randomized trials (7). Among the 1150 women randomized, the percent with excess gestational weight gain per week was significantly lower in the intervention group compared with those in standard care (61.8% vs 75.0%, $p<0.001$), although most women in the lifestyle intervention group still exceeded IOM guidelines for weight gain in pregnancy. Total weight gain from enrollment in early pregnancy to 36 weeks' gestation was also lower in the intervention group (mean difference between groups: -1.58 kg [$-2.18, -0.99$], $p<0.001$). This mean difference was more than double that which was reported in two large, recent studies among overweight or obese pregnant women (4, 5); however, no differential effects on rates of macrosomia, cesarean section or gestational diabetes were observed in LIFE-Moms. And despite an increase in the proportion of intervention participants gaining below IOM guidelines compared to those in standard care (20.6% vs. 14.2%, $p=0.002$), there was not a concomitant increase in small-for-gestational age infants among intervention subjects (albeit limited power in LIFE-Moms to detect harm).

It is important to fully appreciate that the LIFE-Moms consortium accomplished what it set out to do – identify lifestyle interventions that reduced gestational weight gain, compared to standard care, in racially and ethnically diverse women with overweight or obesity. However, the lack of concurrent improvement in short-term maternal and neonatal outcomes somewhat dampens the impact. So where do we go from here? While recent reviews have called for more research evaluating lifestyle interventions before pregnancy, so to reduce pre-pregnancy body mass index (8), it is unclear whether this “pre-“ prenatal strategy will

effectively reduce maternal/neonatal morbidity and be generalizable (since nearly half of pregnancies are unplanned). Moreover, what does this mean for the more than 50% of women who enter pregnancy already with overweight or obesity?

There is still reason to be optimistic. More intensive interventions that produce larger between group differences may be one answer for women entering pregnancy with obesity; for example, Vesco and colleagues weekly group-based weight management intervention produced a mean difference of -3.4 kg between intervention and control groups, and a reduction in large-for-gestational age newborns (9). Further, only 44% of intervention participants exceeded IOM guidelines compared to over 60% in LIFE-Moms, demonstrating that it may be necessary to have greater reductions in the proportion of women exceeding IOM guidelines to achieve significant health benefits. LIFE-Moms ongoing post-pregnancy research may also reveal between group improvements in long-term maternal weight outcomes, findings that could reduce the trajectory of weight gain among childbearing women and have encouraging effects on the outcomes of subsequent pregnancies. Additionally, timing of excessive gestational weight gain in the first half of pregnancy may be more important than total excessive gestational weight gain in predicting excessive neonatal adiposity (10), and thus, future trials focusing on timing of gain could have greater influence on short- and long-term measures of infant weight. There remains a significant amount of research to be done in pregnancy before we abandon hypotheses about gestational weight gain.

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