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Commentary

Optimal gestational weight gain

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Gestational weight gain (GWG) is usually defined as a change in maternal weights measured before pregnancy and prior to delivery, which is crucial to fetal growth and subsequent breastfeeding. Both excessive and inadequate GWG affect maternal and offspring health [1]. What is an appropriate GWG during pregnancy is widely concerned. The available recommendation, predominantly based on evidences from the Caucasian population, was provided in 2009 by the National Academy of Medicine (NAM, formerly the Institute of Medicine) [2]. Due to intrinsic differences in anthropometric measures among ethnic populations, the recommendation is likely more appropriate for the Caucasian women rather than for the Asian or Chinese women. Relevant data for the Asian populations are sparse.

In *The Lancet Regional Health – Western Pacific*, Wing Hung Tam and colleagues' reported on the optimal GWG in Chinese women [3]. The authors performed a secondary analysis on GWG and birth outcomes, using data from 1465 women enrolled in the original "Hyperglycemia and Adverse Pregnancy Outcome" study in 2000–2006 in Hong Kong. Potential optimal GWG ranges were generated by using three models that were based on different adverse birth outcomes. The first model was based on small and large for gestational age, the second one based on lean and fat infants, and the third one based on the integration of the first and second models. The three potential optimal GWG ranges were then linked to cardiometabolic indices of children at 7 years old. The results suggested the GWG ranges derived from the second model appeared optimal, i.e. 14.0–18.5 kg for underweight women, 9.0–16.5 kg for normal weight women, and 5.0–11.0 kg for overweight women, respectively. These optimal GWG ranges were associated with the lowest cardiometabolic risk; by using these GWG ranges versus NAM recommendation, 10% more women were classified as having optimal GWG during pregnancy.

Approximately a half of pregnant women have excessive GWG worldwide [1], more than one third of whom occurs in China [4]. Understanding optimal GWG in the Chinese population is crucial to prenatal care providers or clinicians to help Chinese women gain healthy weight and prevent excessive weight gain during pregnancy. Recently, the US Preventive Services Task Force (USPSTF) [5] conducted a systematic review and meta-analysis to conclude that counselling and active behavioural interventions (e.g. supervised exercise programs, prescribed exercise or dietary programs) were effective in weight gain control during pregnancy. These interventions reduced mean GWG by approximately 1 kg, reduced the risk of excessive GWG by 17%, and even reduced the risks of gestational diabetes, emergency cesarean delivery, macrosomia and large for gestational age. Accordingly, the USPSTF recommends that prenatal care providers or clinicians should offer pregnant women effective behavioural interventions including healthy eating and physical activity to promote healthy GWG [6]. The interventions can start before the second trimester till delivery.

Wing Hung Tam and colleagues' study used both birthweight and neonatal adiposity outcomes in an attempt to address the issue of optimal GWG. Different outcomes are likely leading to different results with different implications. For example, the second model used outcomes related to neonatal adiposity that might be much likely affected by maternal GWG [7], so it is understandable that the results derived from the second model is inclined to predict offspring's obesity risks or even cardiometabolic risks [8]. It was merited that cardiometabolic measures in 7-year-old children were also incorporated in this study, since excessive GWG may impose the latent risks on long-term child health outcomes such as adiposity, cardiovascular risk, asthma or wheeze and autism spectrum disorders [9]. Main limitations of this study are: study subjects are enrolled merely in southern China, the samples size of 1465 appears not adequate, and the number of obese women is too small to perform any in-depth analyses in this particular group. Anthropometric characteristics between the southerners and the

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northerners may differ, likely leading to different optimal GWG. An appropriate GWG for obese women seems more meaningful for public health, not only because obesity per se is concerned and reported to be associated with various adverse birth outcomes, but also because the obesity rate is increasing.

The GWG is potentially modified to benefit maternal and offspring health. The optimal GWG is needed to be investigated and developed for the Chinese that accounts for a large proportion of worldwide pregnant women. The development of the optimal GWG needs an appropriate methodology, needs a large-scale representative and reliable dataset, and needs to consider both short- and long-term health impacts, though often not easy to be compromised.

Declaration of Competing Interest

We declare no competing interests.

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