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Editorial

Taiwan birth weight reference

Topçu et al[1] are the authors of a good reference article entitled "Birth weight for gestational age: a reference study in a tertiary referral hospital in the middle region of Turkey". This retrospective study enrolled 68,255 live singleton pregnancies delivered at 22–42 gestational weeks in Dr Zekai Tahir Burak Women's Health Education and Research Hospital, Ankara, Turkey, between 2007 and 2013.[1] Although we applaud the publication of this article, the underlying study added little new information to the existing literature.

Several population-based references for measuring birth weight for gestational age have been previously generated.[2–4] However, most of these studies focused on Western countries.[2–4] For example, a recent publication by Talge et al[4] used an algorithm based on birth weight and the concordance between these gestational age estimates to calculate the gestational age- and sex-specific birth weight means, standard deviation (SD), and smoothed percentiles (3rd, 5th, 10th, 90th, 95th, and 97th) by the National Center for Health Statistics (n = 8,130,051 births to United States resident women).[2] The main findings of Talge et al's[4] study included (1) nearly 90% of births occurred at term (37–41 weeks), whereas 8% and 2% of births occurred within the preterm (<37 weeks) and post-term ranges (≥42 weeks), respectively; (2) males comprised 51% of the births, and 49% of infants were first-borns; (3) non-Hispanic white was the most prevalent (54%); (4) the mean gestational age at delivery was 38.6 weeks with a SD of 2 weeks; (5) birth weight increased as gestational week increased, with the largest SDs observed after 33 weeks for both males and females; and (6) the 50th percentile of body weight at 38 weeks, 39 weeks, and 40 weeks was 3183 g, 3315 g, and 3407 g, respectively (Table 1). By contrast, Topçu et al's[1] study provided significantly less information, including (1) the 50th percentile of body weight at 38 weeks, 39 weeks, and 40 weeks was 3220 g, 3320 g, and 3400 g, respectively; and (2) males comprised 54.1% of the births, even though investigators claimed that their study was the first to evaluate such a number of participants in Turkey and the results might be a good reference to define normal and abnormal fetal growth in newborns in Turkey.[1] In addition, as shown by Topçu et al,[1] this study was based on cross-sectional data; therefore, it does not reflect the longitudinal growth trajectory of individual infants. It is possible that longitudinal assessments of fetal size, although more expensive and challenging to obtain, might yield estimates that diverge from those presented in Topçu et al's[1] article in this issue. Furthermore, it is possible to misclassify newborns because of systematic error in plotting birth weight percentile values, which was first proposed by Rochow et al[5] in 2012, because we found the unusually heavier birth weight of female newborns in the study. However, nearly all studies have shown that the birth weight of male newborns was significantly higher than that of female newborns.[2,3,6]

When we see such parameters for newborns from other countries such as Turkey, we enthusiastically look forward to seeing how such new information compares to parameters established from Taiwan's data. Could they reliably be used as reference? In a 2006 study, Hsieh et al's[6] findings included confirmation that: (1) the birth weight distribution and percentile during the period of 1998–2002 were similar to those reported for the period of 1979–1989; (2) the 50th percentile of birth weight at the 40th gestational month among the male and female newborns was 3374 g and 3250 g, respectively; (3) at the gestational age of 37 weeks, the 50th percentile of birth weight among the male and female newborns were 2941 g and 2832 g, respectively; and (4) from 1998 to 2002, there was a gradual increase in the prevalence of low birth weight and preterm birth together with the percentage of infants born to foreign-born mothers (immigrants), suggesting the possibility of worse outcome secondary to these immigrants. There is no doubt that an epidemiologic paradox and heterogeneity of birth outcomes might vary by different races and countries. In addition, it is believed that newborns of certain immigrant mothers are smaller at birth than those of domestically born mothers.[7] However, in 2008, Liu et al's[8] study showed conflicting data where the preterm rate among aboriginal Taiwanese was significantly higher than those of immigrants (mainland Chinese; 13.5% vs. 6.3%). Another study by Shen et al[9] in 2009 also supported the favorable outcome of newborns by immigrants (not limited on mainland Chinese), including (1) the lower birth weight rate among the newborns of immigrants than those of aboriginal Taiwanese (4.1% vs. 5.9%), and the heavier mean birth weight from immigrants than those from aboriginal Taiwanese (3157 ± 415 vs. 3110 ± 437 g); and (2) the characteristics of immigrants tended to be more favorable in terms of age, substance use history, predisposing maternal risk factors, and health condition during pregnancy, with the exception of the prevalence of syphilis, by evaluating birth weight for singleton live births

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Table 1
Smoothed 10th percentile, 50th percentile, and 90th percentile of birth weight for gestational age 38 weeks, 39 weeks, and 40 weeks of the whole population (male and/or female newborns) in Turkey, the United States, and Taiwan.

GA	10th percentile BW			50th percentile BW			90th percentile BW		
37 wk	Turkey	US	Taiwan	Turkey	US	Taiwan	Turkey	US	Taiwan
M + F	2500	2588	—	3060	3126	—	3610	3717	—
M	2580	—	2499	3080	—	2941	3580	—	3433
F	2400	—	2391	3040	—	2832	3650	—	3334
38 wk									
M + F	2700	2665	—	3220	3183	—	3770	3752	—
M	2700	—	—	3190	—	—	3700	—	—
F	2687	—	—	3250	—	—	3840	—	—
39 wk									
M + F	2800	2810	—	3320	3315	—	3880	3871	—
M	2800	—	—	3290	—	—	3800	—	—
F	2810	—	—	3360	—	—	3970	—	—
40 wk									
M + F	2890	2904	—	3400	3407	—	3960	3954	—
M	2900	—	2914	3370	—	3374	3850	—	3890
F	2880	—	2816	3490	—	3250	4130	—	3747

Data are presented in grams.
BW = birth weight; F = female newborns; GA = gestational age; M = male newborns; M + F = all newborns.

from 399,551 newborns by maternal nationality in Taiwan based on the Taiwan Birth Registry 2005−2006. Taken together, an epidemiologic paradox and heterogeneity of birth outcomes might really exist; therefore, birth weight curves need to be modified for newborns of immigrant mothers, especially for those countries with a continuously increasing number of immigrants, including Taiwan. Table 1 shows the 10th percentile, 50th percentile, and 90th percentile of birth weight in Turkey, the USA, and in Taiwan.

Finally, the sex ratio of newborns (defined as the ratio of males to females in a population and assumed to be close to 1:1) is an interesting topic, because an increase in the proportion of male-to-female live births has raised concerns in Taiwan and disclosure of fetal sex during prenatal screening is not allowed by the Taiwan government.[10−14] The nationwide sex ratio at birth in Taiwan remained constant at 1.08 during the period from 1992 to 2011, with the highest ratio at 1.1057 in 2004 and the lowest at 1.0759 in 1993.[10] From Topçu et al's[1] study, the male-to-female sex ratio was abnormally high (1.18), compared with other countries (1.04 in the US, 1.05 in the world, and 1.08 in Taiwan),[4,11] except when compared to rural areas of China (1.20 in China).[15] Therefore, if the national sex ratio in Turkey is not 1.18, it is not appropriate to claim that Topçu et al's[1] study could be a good reference to define normal and abnormal fetal growth in newborns in Turkey.

Conflicts of interest

The authors declare that there are no conflicts of interest related to the subject matter or materials discussed in this article.

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