

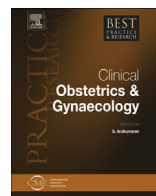


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Birth-weight charts and immigrant populations: A critical review



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There is an increasing body of literature focusing on differences in newborn size between different population subgroups defined by racial, ethnic, and immigration status. The interpretation of these differences as pathological or as merely reflecting normal variability is not straightforward and may have consequences for the provision of obstetric and neonatal care to minority populations. In this review, we critically assess some methodological issues affecting the assessment of newborn size and their potential implications for minority populations. In particular, we discuss the pros and cons of different types of newborn birth-weight (BW) charts (i.e., single local population-based references, minority-specific references, and a single international standard) to determine abnormal newborn size, with emphasis on immigrant populations. We conclude that size alone is not enough to inform clinical decisions and that all newborn size charts should be used as screening tools, not as diagnostic tools. Parental minority status may be regarded as a marker and used to further inquire about individual risk factors, particularly among immigrants who may not have a complete medical history in the new country. Finally, we outline areas for further research and recommendations for clinical practice.

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Over the last few decades, there has been an increasing interest in the variability of fetal growth between populations. This question has been addressed mainly in immigrant-receiving societies, where immigrants live side by side with the domestically born population. Differences in clinical outcomes such as low birth weight (LBW) and small for gestational age (SGA) have been found according to the parents' race, ethnic group, or migrant status.

How can such disparities be understood? Do they express physiologic variation founded in genetic heterogeneity? Or, are they due to differences in environmental influences such as obstetric practice or the social determinants of health? The answer to these questions has implications for the application of newborn size charts in clinical practice.

First, we provide a background on BW charts and discuss its potential application to minority groups. We finally outline a research agenda and provide a few recommendations for clinical practice.

A few notes on birth weight

BW has been a popular metric in research studies. Its attractiveness stems from its precise and reliable measurement and its widespread availability in health information systems. Most studies have focused on LBW, defined as newborn weight <2500 g, which has been used to predict adult health and mortality [1]. However, it is now increasingly recognized that LBW is not an optimal metric for either research studies or use in clinical practice. LBW is a single characteristic that may be the result of multiple causes affecting the uterine environment and mediated by short gestation (i.e., the length of gestation is the strongest correlate of BW), intrauterine growth restriction (IUGR), or both. The prevailing trend is to consider LBW as a complex syndrome with multiple etiologies rather than a single entity.

Birth-weight differences between immigration groups

There are two key findings regarding BW and immigration. First, comparisons between immigrants and the native-born individuals of industrialized countries give mixed results [2]. While in Canada and the UK immigrant mothers give birth to newborns who are generally lighter than those born to native-born mothers [3,4], the opposite had been documented in the US, France, and Belgium [5,6]. Inconsistency in results may be due to multiple reasons, including different sociodemographic profiles and health behaviors [3], differing definitions of immigrant groups, comparison groups, and study settings [2,7]. Therefore, interpreting the evidence is not straightforward.

The second main finding is that immigrant mothers in industrialized countries give birth to newborns generally heavier than those born to their same-country counterparts who did not migrate and remained in their home countries [8]. This finding may be partly a reflection of the “healthy immigrant effect.” Selective migration may be affected by self-selection to emigrate, immigration admission, and integration policies of the receiving countries [9]. For example, countries receiving primarily voluntary migrants are expected to have healthier immigrants than those admitting mainly refugees. Differences in the social environment and health-care system of the receiving countries are also thought to influence BWs post migration, although the evidence is scarce.

Are lower BWs bad? The literature has tended to interpret differences in BW and LBW between groups as pathological. However, significant BW differences may not necessarily have an impact on adverse outcomes. One classic example is that of infant sex. BWs of female newborns are on average about 200 g less than those of males, but their infant mortality rate is also lower. Besides, living at high altitudes leads to lower BWs but not to higher mortality rates [10]. In the same vein, in some countries where the proportion of LBW babies is high, such as Sri Lanka, their infant mortality is lower than expected [11]. Should we therefore interpret differences in BW between immigrants and non-immigrants as resulting from pathological processes or as adaptations of certain groups to differing environments? In other words, do lower BWs of immigrants mean that they are more affected by fetal growth restriction? Or, that babies of native-born parents in industrialized are more likely to be overweight? These questions have no easy answers, given the multiple determinants of BW. Part of the difficulty also lies in the limitations of BW as a meaningful study outcome. Both mean BW and LBW are jointly influenced by the duration of gestation and fetal growth, among other factors, making it

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