SUITABILITY OF APPLYING BIRTH WEIGHT STANDARDS FROM DIFFERENT POPULATIONS IN HONG KONG CHINESE NEWBORNS

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Background and Aims

Neonatal birthweight reference charts are important tools for neonatologists to evaluate high-risk newborns, especially to detect small-for-gestational-age (SGA) babies, who are at significantly increased risk of short- and long-term complications. Currently in Hong Kong, clinicians use charts derived locally by Fok et al from data obtained 20 years ago with a relatively small sample size. On the other hand, INTERGROWTH-21st Project have produced international standards and encouraged diverse localities to adopt universal growth references. However, many investigators have demonstrated ethnic and geographic differences, which were also seen in INTERGROWTH-21st project participants. The birthweight reference for Chinese newborns has been updated recently using data from the Chinese neonatal network (CNN). Studies by Fok et al and CNN both included infants born to mothers with complications of pregnancy while the INTERGROWTH-21st Project only included infants born to healthy mothers. This study aims to investigate which of the three references fit the current neonatal birthweight data of Hong Kong, so that we may consider updating the reference for Hong Kong Chinese babies using a larger and potentially more robust population-based dataset.

Methods

Birthweight data of the eight public birthing centres in Hong Kong from 1/1/2010 to 15/07/2010 were extracted from the Hospital Authority computerised system. Singleton booked Chinese babies born between 23 and 42 weeks’ gestation without major congenital anomalies, syndromal disease or hydrops fetalis were included. The three birthweight references were applied to the current data. Discrepancies of median between the data and references at each gestational week stratified by sex were standardized and compared. The fitness of 10th and 90th percentiles were examined using p-charts. New birthweight centiles for preterm neonates were created with the current data using cubic splines assuming a skewed t distribution and compared with the existing reference values in terms of the predictive power for complications of SGA (e.g. hypothermia, hypoglycaemia, asphyxia, polycythemia, etc.) using receiver operating characteristics (ROC) curves and the area under the curve (AUC).

Results

Birthweight data of 272,347 newborns were included (142,712 boys and 129,635 girls). Preterm infants accounted for 7%. The mean birthweight of term babies was (3234±384)g for boys and (3125±375)g for girls. The standardized difference values for median between our data and the three references were almost all within the range of 0.5 SD (Figure 1). However, 10th and 90th percentile values were significantly different between references, especially in preterm neonates. In the p-charts for preterm SGA, Fok et al’s reference had the most points falling out of the control limits, while reference based on CNN data had the least (Figure 2). Using Fok et al’s reference led to significantly more very preterm infants classified as SGA (17.8% for boys and 16.8% for girls). New birthweight centiles were generated for preterm neonates(Figure 3), and the 10th centile values were similar with those based on CNN data, while 90th centile values similar with INTERGROWTH-21st standard.

Conclusion:

The local birthweight reference values derived by Fok et al’s work 20 years ago may lead to substantially more very preterm infants classified as SGA. Using data in recent 10 years, we suggest that an updated birthweight reference for Hong Kong born Chinese babies may be warranted.

References