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Birthweight reference standards at the federal university of Rio de Janeiro

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Objective

To determine the birthweight standard at the Maternity School and compare it to currently used standards in the clinical practice services.

Methods

Cross-sectional, observational, and descriptive study. Data from infants born between 2011 and 2016 were collected from the Maternity School hospital of the Federal University of Rio de Janeiro to define the 10th, 25th, 50th, 75th, and 90th percentiles of the birthweight by gestational age. It was determined the performance of the INTERGROWTH-21st, Fenton, Alexander, and Lubchenco for the maternity school standards.

Results

A total of 10,847 cases were considered eligible for the present study. Although, 1,427 cases were excluded due to incomplete data. Moreover, cases were excluded as a result of inaccurate annotation (n = 538), multiple gestations (n = 199), stillborn (n = 88), fetal pathologies (n = 173) and maternal morbidities (n = 2,360). The final sample was of 6,062 cases. All patients selected for the present study were divided into groups considering gestational age at birth. The weights in grams of the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles for each gestational age and the respectives 95% CI are shown in respective tables, as well as the proportion of SGA, AGA, and LGA for pregnancies of 24 to 32 weeks classified by the INTERGROWTH, the FENTON, the ALEXANDER and the LUBCHENCHO standard (95% CI). For pregnancies up to 32 weeks, the FENTON standard showed results closer to expected, with proportions of SGA and LGA of 4.95% and 10.89%, respectively. The ALEXANDER and LUBCHENCO standards showed similar results, with the same proportion of SGA, of 3.96% and LGA of 3.96% and 4.95%, respectively. Considering normal and low risks pregnancies from week 33 to week 42, the performance of the growth curve elaborated in the present study was evaluated, with 9.59% SGA and 10.35% LGA. The proportion of SGA, AGA, and LGA for pregnancies of 33 to 42 weeks classified by our growth curve, the INTERGROWTH, the FENTON, the ALEXANDER and the LUBCHENCHO standard (95% CI) are presented in another table. When assessing the INTERGROWTH standard, a percentage of 7.16% of SGA and 9.61% of LGA was observed. For SGA, the FENTON curve showed a result closer to the expected, with 10.85%. For LGA the result was 5.48%. Regarding the ALEXANDER and LUBCHENCO curves, the performance was similar: 4.94% and 5.08% of SGA and 13.40% and 12.46% of LGA, respectively. After considering cases with maternal morbidities, the proportions of SGA, AGA, and LGA of newborns between 33 and 42 weeks were recalculated. The FENTON standard showed a performance close to that expected for SGA (11.30%), but only 6.08% for LGA.

Conclusion

The present cross-sectional, observational, and descriptive study was able to define reference values for birthweight for the maternal school hospital of the Federal University of Rio de Janeiro considering at least 33 weeks of pregnancy with a 95% CI. For premature deliveries (24 to 33 weeks of pregnancy), the reference values were not defined with a 95%CI. The comparison of the INTERGROWTH, FENTON, ALEXANDER, and LUBCHENCO standards to the maternal school hospital curve considering SGA, AGA, and LGA showed that the FENTON curve was the most suitable for the diagnosis of SGA.

Table 1: Proportion and CI 95% of SGA, AGA, and LGA for pregnancies of 24 to 32 weeks classified by the four reference birthweight curves.

	INTERGROWTH		FENTON		ALEXANDER		LUBCHENCO	
SGA	1.98%	0.48% - 7.74%	4.95%	2.04% - 11.50%	3.96%	0.84% - 9.60%	3.96%	1.46% - 10.23%
AGA	95.04%	88.49% - 97.95%	84.15%	75.52% - 90.14%	92.07%	84.79% - 96.03%	91.08%	83.59% - 95.35%
LGA	2.97%	0.94% - 8.96%	10.89%	6.07% - 18.76%	3.96%	1.46% - 10.23%	4.95%	2.04% - 11.50%

CI: Confidence interval; Maternidade Escola da Universidade Federal do Rio de Janeiro; SGA: small for gestacional age; AGA: adequate for gestational age;LGA: large for gestational age

Table 2: Proportion and CI 95% of SGA, AGA, and LGA for pregnancies of 33 to 42 weeks classified by local (ME/UFRJ) and four reference birthweight curves.

	ME/UFRJ		INTERGROWTH		FENTON		ALEXANDER		LUBCHENCO	
SGA	9.59%	8.87% - 10.37%	7.16%	6.53% - 7.84%	10.85%	10.08% - 11.66%	4.94%	4.42% - 5.52%	5.08%	4.55% - 5.67%
AGA	80.05%	79.01% - 81.04%	83.22%	82.25% - 84.15%	83.66%	82.69% - 84.57%	81.64%	80.64% - 82.61%	82.45%	82.25% - 84.15%
LGA	10.35%	9.60% - 11.15%	9.61%	8.88% - 10.38%	5.48%	4.93% - 6.09%	13.40%	12.56% - 14.29%	12.46%	11.64% - 13.32%

CI: Confidence interval; Maternidade Escola da Universidade Federal do Rio de Janeiro; SGA: small for gestacional age; AGA: adequate for gestational age;LGA: large for gestational age

GESTATIONAL AGE (WEEKS)	PERCENTILES (birthweight in grams)						
	5th	10th	25th	50th	75th	90th	95th
24	650	650	650	675	700	700	700
25	730	730	730	737.5	936.25	1000	1000
26	800	800	827.5	940	1160	1180	1180
27	730	730	820	1030	1130	1365	1365
28	630	706	1065	1170	1265	1320	1330
29	1180	1213	1316.25	1452.5	1591.25	1631.5	1645
30	1015	1172.5	1392.5	1557.5	1706.25	1797	1895
31	1208.5	1258	1427.5	1600	1822.5	1989	2045
32	1515	1555.5	1732.5	1945	2141.25	2378	2585
33	1243	1481	1750	2010	2375	2600	2742
34	1571.25	1795	1975	2265	2522.5	2932.5	3141.25
35	2027.75	2085	2312.5	2565	2815	3143.5	3365
36	2098.75	2363	2607.5	2784.5	3065	3338.5	3489.25
37	2423.5	2512	2735	2975	3237.5	3543	3741.5
38	2534	2665	2895	3165	3440	3725	3897
39	2680	2805	3030	3275	3550	3775	3970
40	2782.25	2915	3140	3400	3685	3975	4175
41	2845.5	2966	3212.5	3520	3790	4068	4230
42	2703	2907	3292.5	3715	3925	4184	4487.5