

Birth Weight and Gestational Age in Bahrain

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ABSTRACT

The birth weight of all Bahraini infants who were born as a result of uncomplicated pregnancy in all Bahraini Government Maternity Hospitals during 1984 and 1985 were analysed. The study showed that the mean birth weight varied between 1628g at 30–31 weeks to 3261g at term. The percentiles were computed, plotted and compared with four different studies. The birth weight values for Bahraini infants were less than those reported from various populations.

Birth weight is considered as an index for the health standard of a community. Social and economic status plays an important part on the variation in the intra-uterine growth rate¹.

Annually throughout the world about 20 million infants are born with low birth weight, the majority of them are from developing countries². Poor intra-uterine growth is associated with increased risk of perinatal mortality and morbidity³ as well as long term physical, intellectual and neurological sequelae⁴.

Information about fetal growth came in the past from postmortem studies^{5,6} measurement of aborted fetuses at different ages⁷ and direct measurements of fetuses obtained by hysterotomy⁸.

Of the various measurements that have been studied to demonstrate the pattern of fetal growth, birth weight is the one most frequently used, being the simplest and the least liable to error¹¹. A great deal of the information on this subject comes from

developed countries. Relevant data are lacking in most of the Arabian Gulf countries including Bahrain. This study was undertaken to establish a birth weight and gestational age curve for Bahraini women and also to determine the percentiles of birth weight for Bahraini infants.

METHODS

All infants who were live-born at Bahraini Government Maternity Hospitals from January 1984 till December 1985 were weighed immediately after birth by a baby weighing machine (SECA) with a beam balance. The weights were recorded by the midwives in the labour room register and in the birth notification forms. The data for this study was collected from the registers of the different maternity hospitals. The analysis of the data was done on IBM 370–155 and DEC PDP 11–34A Computer Systems using SPSS software.

The gestational age of the baby at birth was determined from the date of the last menstrual period and the date of delivery; cases were excluded from the analysis if the date of the last menstrual period was uncertain or unknown; or if clinical considerations cast a doubt on the calculation of the gestational age.

In order to improve reliability when discussing normality, careful screening was done to exclude all known conditions which might affect the birth-weight of infants e.g. hypertensive disorders, diabetes, intra-uterine growth retardation, multiple pregnancy and congenital malformations.

RESULTS

The range of gestational age for 13,834 infants, 6947 males and 6887 females used in the study was from 30–41 weeks. The mean (SD) birth weight by gestational age is shown in Table 1. It varies between 1628.97g with SD 327.9 at 30–31 weeks gestation to 3335.59g with SD 459.8 at 41 weeks.

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TABLE 1
Mean (SD) Birth Weight by Gestational Age

<i>Gestational Age (Weeks)</i>	<i>Birth Weight (g)</i>		
	<i>N (No. of cases)</i>	<i>Mean</i>	<i>SD</i>
30-31	39	1628.97	327.9
32-33	68	1891.47	331.2
34-35	118	2224.91	374.9
36	306	2489.77	345.6
37	420	2618.36	308.8
38	1819	3106.75	499.3
39	2626	3219.47	478.4
40	7218	3261.83	464.9
41	1220	3335.59	459.8
Total	13834		

TABLE 2
Mean (SD) Birth Weight by Gestational Age and Sex

<i>Gestational Age Weeks</i>	<i>Birth Weight (g)</i>					
	<i>Male (N = 6947)</i>			<i>Female (N = 6887)</i>		
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
30-31	16	1723	352	23	1564	301
32-33	29	2019	356	39	1797	280
34-35	71	2225	338	47	2225	429
36	138	2472	367	168	2507	326
37	204	2597	300	216	2638	316
38	929	3166	467	890	3044	524
39	1310	3270	493	1316	3171	459
40	3657	3318	470	3561	3202	452
41	593	3382	480	627	3293	437

TABLE 3
Percentiles of Birth Weight by Gestational Age

<i>Gestational Age (in weeks)</i>	<i>Percentiles of Birth Weight(g)</i>												
	3	5	10	20	30	40	50	60	70	80	90	95	97
30–31	1096	1110	1200	1330	1400	1450	1640	1700	1850	1950	2120	2190	2250
32–33	1320	1370	1458	1646	1697	1798	1915	1950	2012	2122	2373	2448	2657
34–35	1487	1564	1699	1848	2017	2150	2280	2380	2440	2514	2731	2800	2870
36	1750	1888	2027	2200	2311	2450	2530	2630	2720	2812	2900	2950	2978
37	1900	2020	2140	2350	2480	2580	2650	2750	2820	2900	2980	3005	3058
38	2221	2350	2534	2730	2870	2980	3070	3200	3330	3500	3700	3850	3980
39	2380	2458	2677	2850	3000	3070	3170	3270	3400	3550	3800	4151	4280
40	2500	2583	2730	2900	3020	3130	3240	3350	3450	3600	3830	4020	4140
41	2493	2600	2750	2982	3100	3180	3295	3430	3570	3730	3950	4120	4235

TABLE 4
Difference in Percentile between Bahrain and other Countries

<i>Centile</i>	<i>Kuwait</i>	<i>Newcastle- Upon-Tyne</i>	<i>Hong Kong</i>	<i>Australia</i>
10th Centile	30–200 g	100–300 g	100–400 g	150–200 g
50th Centile	70–300 g	100–350 g	30–350 g	140–400 g
90th Centile	50–600 g	100–700 g	100–500 g	150–500 g

Fig. 1

PERCENTILES OF BIRTH WEIGHT BY GESTATIONAL AGE

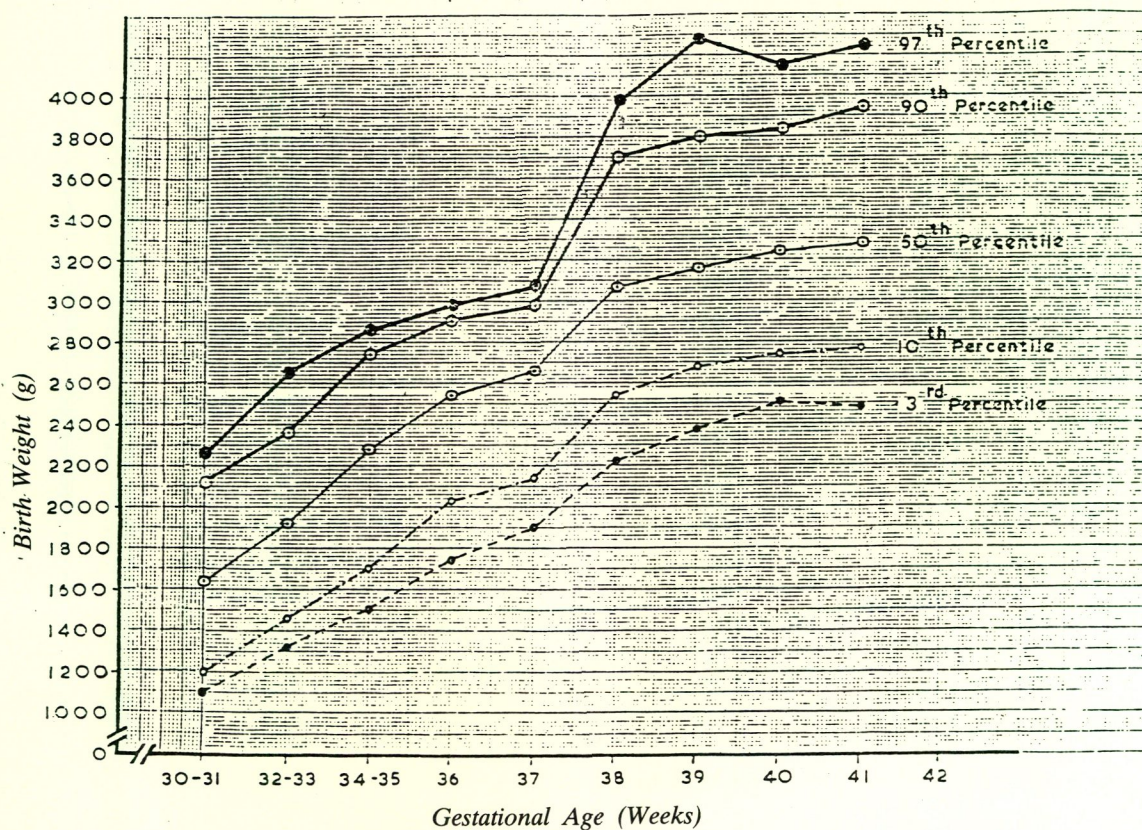


Fig. 2

PERCENTILES OF BIRTH WEIGHT BY GESTATIONAL AGE

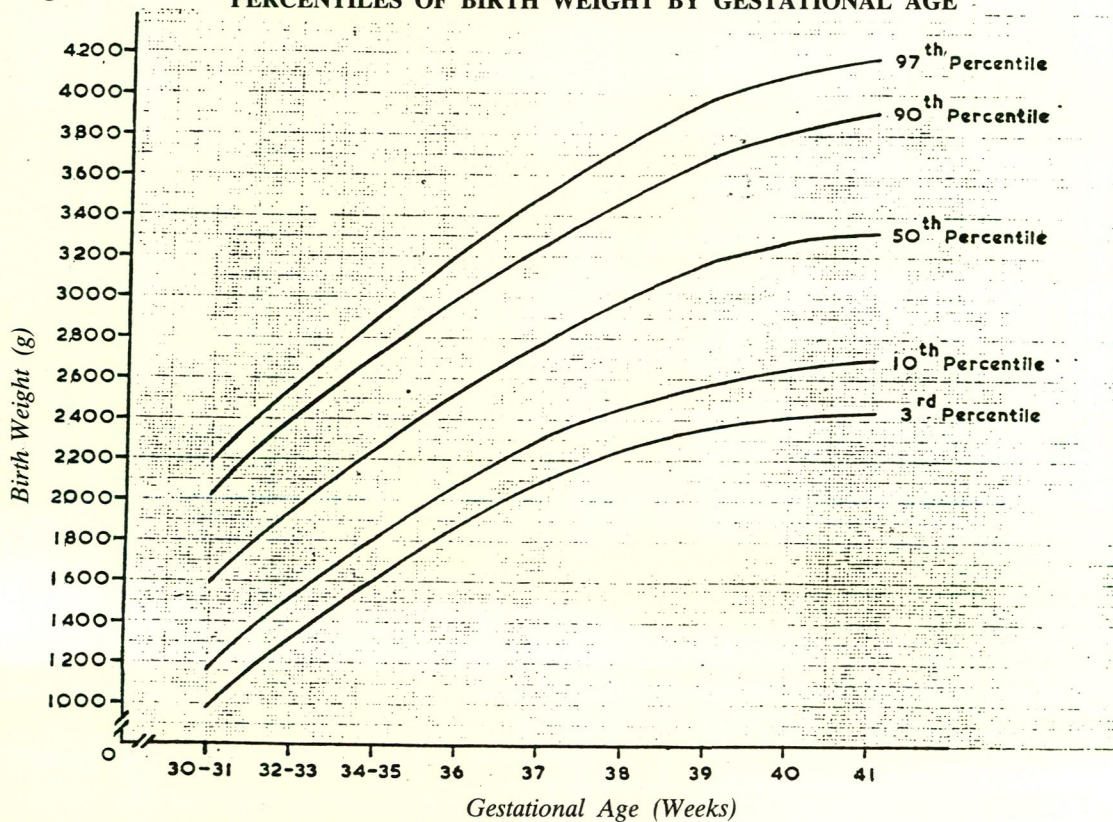


Fig. 3

MEAN BIRTH WEIGHT BY GESTATIONAL AGE AND SEX

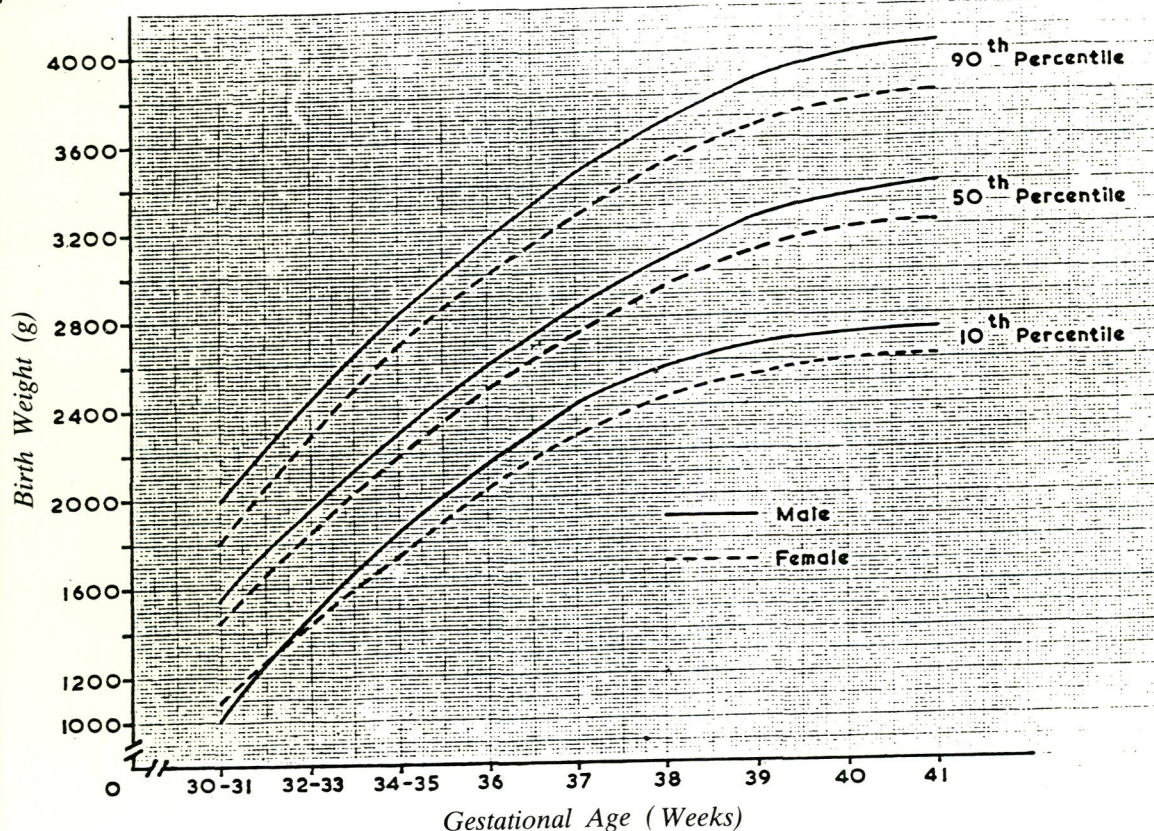


Figure 1 shows the actual percentiles of birth weight by gestational age.

Figure 2 shows the smoothed birth weight percentiles for gestational age between 30–41 weeks.

The mean birth weight by gestational age and sex is tabulated in Table 2 and graphed in figure 3. The mean birth weight at term for males was around 150g heavier than females.

The percentiles of birth weight by gestational age is tabulated in Table 3.

Table 4 shows the difference in the percentiles of birth weight between Bahrain and four other different studies. It is noted that the values of 10th, 50th and 90th percentile were all less in Bahrain than those reported by different studies for different countries.

DISCUSSION

The two parameters which have been used to establish the pattern of normal growth and deviation from it are birth weight and gestational age. To estimate birth weight all that one needs is a reasonably accurate pair of scales, but the estimation of gestational age is absolutely fundamental⁹.

Through this study we tried to meet the three epidemiological requirements put by Thomson et al.¹⁰. Our measurements were accurate, based on unselected live births of Bahraini infants. We excluded all cases with any known condition mentioned before which might affect the birth weight.

Lubchenco et al.¹¹ made an important contribution to the study of the weight of the fetus in relation to its age. Others also presented similar studies^{10,12}. Our study follows a similar linear course and is illustrated in figure 2.

The effect of fetal sex on birth weight is well known. Birth weight by sex were practically identical at 32–33 weeks and then gradually diverged, males being about 150 grams heavier than females at term¹⁰. Our study confirmed the above findings.

The tenth, fiftieth and ninetieth percentiles for Bahrain were compared with various reported percentiles for other populations from Kuwait¹³, Newcastle-upon-Tyne¹⁰, Hong Kong¹⁴, and Australia¹⁵.

TENTH PERCENTILES

The tenth percentile values of all other compared studies were higher than those of Bahrain. The difference between 10th percentile values for Bahrain and those for Kuwait, Newcastle-upon-Tyne, Hong Kong and Australia were 30–200g, 100–300g, 100–400g, and 150–200g, respectively.

FIFTIETH PERCENTILE

The Fiftieth percentile or the mean birth weight for Bahrain study was again less than all others. The difference between this value for Bahrain and those for Kuwait, Newcastle-upon-Tyne, Hong Kong, and Australia were 70–300g, 100–350g, 30–350g and 140–400g respectively.

NINETIETH PERCENTILE

The Ninetieth percentile values for Kuwait and Australia were always more than those of Bahrain and the difference being 50–600g and 150–500g respectively. In case of Newcastle-upon-Tyne and Hong Kong the differences were 100–700g and 100–500g respectively.

In all percentiles from all various compared studies the discrepancy reached its maximum at 37 weeks.

Our findings suggest that on the whole the birth weight values for Bahrain are less than those reported from various populations. This agrees with our assumption except in the case of Kuwait where we have expected the values to correlate with those

of Bahrain on account of similar race, same culture and geographical location. However, we found that such was not the case. This finding could be explained by the inclusion of different nationalities in the latter study.

CONCLUSION

The mean birth weight for Bahraini infants in this study has been found smaller than the mean birth weight found in other studies of Kuwait, Newcastle-upon-Tyne, Hong Kong and Australia.

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