Geographical Distribution of Birth-weight in Bahrain

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ABSTRACT

The birth-weight of 842 infants born between June 1982 and May 1984 were studied in order to determine the association of geographical areas with birth-weight. The findings showed that Bahraini infants born in Riffa had the highest mean birth-weight (3372g) than Bahraini infants born in other regions (ranged from 3127g in Jidhafs to 3298g in Northern area). Statistically significant differences between mean birth-weight of males and females were only observed in Manama. In general, areas with high socio-economic levels showed higher mean birth-weight than areas with low socio-economic levels.

Birth-weight has become a focus of interest of many public health studies. It is considered as one of the important factors associated with perinatal morbidity and mortality. Birth-weight has also been used as an indicator of the health status of a population[1]. Studies in countries other than Bahrain showed that birth-weight is influenced by many demographic[2], social[3] and maternal[4] factors.

In Bahrain, two studies were carried out on birth-weight. Musaiger[5] found that sex, geographical location, mother's age and interval between births contributed significantly to birth-weight of the new-born in Bahrain; whereas mother's nationality and number of past deliveries were not significant contributory factors. The second study by El-Shafei and Mostafa[6] demonstrated that the mean birth-weight of Bahraini infants is lower than that of developed countries and some well-to-do developing countries, but is higher than many other developing nations. However, both studies have not investigated the association of geographical areas with birth-weight distribution.

The study by Musaiger[5] examined the influence of urban and rural location on birth-weight. The findings of his study gave a broad picture on the effect of geographical areas on birth-weight. The present study, therefore, was carried out to provide detailed information on the distribution of birth-weight by each geographical area in Bahrain, as well as to study the association of sex and nationality with mean birth-weight.

METHODS

Birth-weight of all new-borns in Bahrain is recorded immediately after birth, in kilograms, in the birth notification forms. Detailed information on the method of measurement of birth-weight is described in a previous study[5]. Birth notification forms for 842 infants born between June 1982 and May 1984 constitute the data base for this study. The sample was selected by using a systematic random sampling technique, by choosing one notification form for every 20 notification forms (5% of the total registered with birth-weight recorded for this period). There was no statistically significant difference in geographical distribution between the sample studied and total registered live births for the mid-year 1983.

Demographic and social characteristics reported in birth notification forms were reviewed and analysed. The present study shows only the association of geographical areas, nationality of infant and sex with birth-weight. It is important to mention that the nationality of infant is based on father's nationality but not on mother's. However according to the national statistics about 90% of Bahraini men get married to Bahraini women. This means that the great majority of Bahraini infants are born from Bahraini mothers too. The geographical areas were

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divided into 8 areas according to the Central Statistics Organization[7].

RESULTS

Of the infants studied, 63% were males and 37% were females. The total mean birth-weight was 3220 ± 50 grams. Males were significantly heavier than females ($p<0.01$). The mean birth-weight for males was 3280 ± 49g, compared to 3150 ± 50g for females.

Bahraini infants represented 73.8% of total infants studied. The mean birth-weight of Bahraini infants was 3250 ± 48g, while that of non-Bahraini was 3160 ± 53g. The difference was statistically significant ($p<0.05$).

The distribution of mean birth-weight by geographical area and sex of infant is illustrated in Table 1. The difference in mean birth-weight between males and females was found to be statistically significant in Manama ($p<0.01$). No statistically significant differences between males and females were observed in all other areas. The highest mean birth-weight of males was recorded in both Riffa (3340 ± 50g) and Northern area (3340 ± 46g) while that of females in Isa Town (3294 ± 52g). The lowest mean birth-weight of males was reported in Jidhafs (3106 ± 49g) and that of females in Manama (3110 ± 50g).

TABLE 1

Mean Birth-weight by Geographical Area and Sex of Infant

Geographical Area	**Sex of Infant**					
	Male		*Female*		*Total*	
	No	*Mean ± SD (g)*	*No*	*Mean ± SD (g)*	*No*	*Mean ± SD (g)*
Muharraq[1]	104	3288 ± 50	76	3148 ± 55	180	3229 ± 53
Manama	199	3303 ± 49	124	3110 ± 50	243	3204 ± 50
Jidhafs	40	3106 ± 40	33	3127 ± 44	73	3115 ± 42
Northern Area	29	3340 ± 46	17	3125 ± 36	46	3261 ± 43
Western Area	22	3256 ± 34	20	3120 ± 66	42	3229 ± 51
Isa Town[2]	59	3315 ± 53	45	3294 ± 52	104	3306 ± 53
Riffa	42	3340 ± 50	36	3211 ± 45	78	3280 ± 48
Sitra	36	3284 ± 54	40	3142 ± 44	76	3209 ± 48

[1] Includes Hidd

[2] Includes Central Area

TABLE 2

Mean Birth-weight by Geographical Area and Nationality of Infant

Geographical Area	**Nationality of Infant**					
	Bahraini		*Non-Bahraini*		*Total*	
	No	*Mean ± SD (g)*	*No*	*Mean ± SD (g)*	*No*	*Mean ± SD (g)*
Muharraq	133	3267 ± 52	47	3121 ± 55	180	3229 ± 53
Manama	128	3253 ± 51	115	3151 ± 49	243	3204 ± 50
Jidhafs	72	3127 ± 41	1	2250 ± 00	73	3115 ± 41
Northern Area	34	3298 ± 37	12	3157 ± 57	46	3261 ± 43
Western Area	39	3234 ± 40	3	3168 ± 53	42	3229 ± 51
Isa Town	93	3286 ± 51	11	3480 ± 58	104	3306 ± 53
Riffa	46	3372 ± 39	32	3148 ± 56	78	3280 ± 48
Sitra	76	3209 ± 49	–	–	76	3209 ± 49

Bahraini infants showed a higher mean birth-weight than non-Bahraini infants. Non-Bahraini infants concentrated in three geographical areas; Manama, Muharraq and Riffa (Table 2). This distribution is similar to that reported by the Central Statistics Organization for live birth statistics[8]. A statistically significant difference in mean birth-weight between Bahraini and non-Bahraini infants was observed in Manama ($p<0.05$). The highest mean birth-weight among Bahraini infants was found in Riffa (3372 ± 39g). Excluding the areas with very low number of non-Bahraini infants (3 and less), the highest mean birth-weight was observed in Isa Town (3480 ± 58g).

DISCUSSION

The present study shows an improvement in mean birth-weight during the period 1980-1984, when compared with an earlier study[5]; the total mean birth-weight of males has increased by 57g, and of females by 10g only. It is difficult to test whether this rise in birth-weight is statistically significant, because standard deviations were not provided in the previous study. The current improvement in mean birth-weight can be attributed in part to improvement in health services in the country.

Studying birth-weight by each geographical area is more valid from public health point of view. This is because some of these areas are characterized by low hygienic conditions, low educational level and low income. In addition, there is no clear cut-off point between rural and urban areas in Bahrain. The definition given by the Central Statistics Organization[7] is based on population size rather than socio-economic characteristics. Our study showed that Jidhafs, Sitra, and Western areas had the lowest mean birth-weight of Bahraini infants compared to other areas. This finding is not surprising as these areas have a high number of villages with relatively low socio-economic levels. On the other hand, areas of high socio-economic levels such

as Riffa, Isa Town, Northern area and Muharraq are characterized by infants with high mean birth-weight. It is well documented that infants of mothers from low socio-economic background weigh less than mothers from a high socio-economic background.[9]

The reason behind the relatively low mean birth-weight in Manama and Muharraq (the two biggest cities in Bahrain) could be due to population movement. Most of the well-to-do families have shifted from these cities to live in other less crowded areas such as Isa Town and Riffa. This leads to a high proportion of low socio-economic families in Manama and Muharraq. However, this conclusion needs more investigation.

The significant difference in mean birth-weight between males and females in Manama is probably due to the influence of nationality. This city has a high percentage of non-Bahrainis (52%), mainly Indians and Far Easterners. Such multi-ethnic factors could affect the mean birth-weight, as many of these expatriates come from poor countries. Musaiger[5] showed that the prevalence of low birth-weight was higher among non-Bahraini (8.2%) than Bahraini mothers (7.2%)

CONCLUSION

The results of this study suggested that although the birth-weight varied from area to area in Bahrain, there was no statistically significant differences in mean birth-weight between most of geographical areas. However, the demographic characteristics such as the nationality and socio-economic levels were among the most important factors associated with birth-weight. Further studies should consider such factors when comparing birth-weight among different geographical areas in Bahrain.

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