BIRTH WEIGHT DISTRIBUTION, MEAN BIRTH WEIGHTS, AND LOW BIRTH WEIGHTS AMONG VARIOUS ETHNIC GROUPS IN MALAYSIAN NEWBORNS

H Yadav

SYNOPSIS

The birth weight distribution, mean birth weight and incidence of LBW amongst the various ethnic groups in Malaysia is described briefly. The data collected and analysed is hospital data where all deliveries in 198C were analysed. The mean birth weight showed that the Chinese had the highest Mean Birth Weight amongst the three ethnic groups and the Indians had the lowest mean birth weights. The overall incidence of LBW was 11.8% and the Malay and Indian babies constituted the high incidence of LBW whereas the Chinese had a low incidence of LBW babies in the study. Amongst the various ethnic groups the Indians had a higher incidence of LBW compared to the Chinese and Malays.

INTRODUCTION

The measurement of birth weight is a significant measurement for many purposes, yet it has been noticed that birth weight data are still lacking in many countries both developed and developing. Most countries do not have a compulsory recording of birth weight on the birth certificate. Most European countries have made it compulsory to note birth weight on the birth certificate only in the last few years.

In others it is still not the rule (1).

The birth weight of an infant is highly significant in two most important respects. In the first place it is strongly conditioned by the health and nutritional status of the mother.

In the same sense the maternal mainutrition, ill health and other deprivation are most common causes of retarded foetal and/or prematurity as mainfested in Low Birth Weight (LBW). In the second place, low birth weight is universally and in all population groups, the single most important determinant of the chance of the newborn to survive and to experience healthy growth and development. For those reasons increasing attention is now being given to birth weight distribution and especially to the pregnancy of low birth weight as a general indicator of health status of population groups (2).

The importance of birth weight has become so significant that it is now being considered in many countries as a new development indicator instead of the usual G.N.P.

Health Office
Parit Buntar
Perak, Malaysia

H Yadav, MBBS, MPH, MRSH (London)
Medical Officer

MATERIAL & METHODS

The data was collected from a 141 bedded hospital. The hospital serves a small town of 20,000 population and catchement population of about 60-80,000 population. The hospital has a 30 bedded maternity ward and 30 bedded childrens ward. The records of all the deliveries in the hospital for 1980 were analysed, summarised and presented.

RESULTS

Table I shows that there were 1227 deliveries in the district hospital and majority were singletons except for 9 twin deliveries in the whole year. The Malays constituted 443 (36.1%) of the deliveries, the Chinese 522 (42.4%) and the Indians 262 (21.3%) of the deliveries. The table also shows that there were 646 males babies (all ethnic groups) as against 581 female babies. The overall male: female ratio was 1.1: 1.

Table 1 also shows the birth weight distribution of all babies born in the hospital in 1980. The LBW (< 2500 gm) incidence in these deliveries was 11.8%. Majority 893 (72.7%) of the deliveries were between 2500 gm and 3500 gm. Only 189 (15.2%) of the total babies were born more than 3500 gm. From Table I it is seen that there are 145 (11.8%) babies below < 2500 gm. Among the 145 babies born below < 2500 gm the Malays had the highest 65 (44.8%), the Chinese had only 34 (23.4%) and Indians had 46 (31.7%). Thus the Malays constituted highest number of LBW babies in this group and Chinese had the lowest number of babies 2500 gm.

Table 1 also shows that 'big babies' or babies > 2500 gm. The Chinese had the largest number of 'big babies' 488 (45.1%), the Malays constituted 378 (34.9%) and Indians had only 216 (19.9%) babies > 2500 gm. Thus from Table I the Chinese had the largest number of babies > 2500 gm and the Indians had the lowest number of babies > 2500 gm.

Table 2 shows the weight distribution of the Malay deliveries in the hospital in 1980. The Malays constituted 443 (36.1%) of the total deliveries in the hospital. The overall LBW of the Malay deliveries was 14.5%. The LBW incidence of Malay male babies was 14.5% and LBW incidence of Malay female babies was 14.8%. Thus there was a slightly higher incidence of LBW amongst Malay female babies. The male constituted 227 (51.2%) as against the female 216 (48.7%). Thus the male: female ratio was 1.05: 1. The majority of the Malay babies 325 (73.3%) were born between 2500-3500 gm.

Table 3 shows the weight distribution of the Chinese deliveries in the hospital in 1980. The Chinese constituted 522 (42.5%) of the total deliveries in the hospital. The overall LBW of the Chinese deliveries was 6.5%. The LBW incidence of Chinese males was 7.0% and the LBW incidence of Chinese females was 5.8%. Thus there was higher incidence of LBW amongst Chinese male babies. The males constituted 284 (54.4%) as against 238 (45.5%) females. Thus the male: female ratio was 1.19: 1. Majority of the Chinese babies 377 (72.2%) were born with a birth weight distribution between 2500-3499 gm.

Table 4 shows the weight distribution of the Indian babies delivered in the same hospital in 1980. The Indian babies constituted 262 (21.3%) of all the deliveries. The overall LBW amongst the Indian babies was 17.5%. The LBW incidence of Indian males babies was 19.2% and the LBW incidence of Indian females was 15.7%. Thus there was a higher incidence of LBW amongst the Indian male babies as compared to the Indian female babies. The males constituted 135 (51.5%) as against the females 127 (48.4%). Thus the male: female ratio was 1.06: 1. Majority of the Indian babies 191 (72.9%) were born with a birth weight distribution of 2500-3499 gm.

Table 5 shows the mean birth weight of the various ethnic groups in the study. The mean birth weight of all babies born was 3.03 kg. and the mean birth weight of the total male babies was 3.05 kg and the total female babies was 3.0 kg. The overall mean birth weight of the Malays was 2.97 kg the Chinese 3.15 kg and the Indian the lowest of 2.83 kg.

Amongst the Malays the males had a higher mean birth weight of 2.99 kg as against the females of 2.95 kg. Similarly amongst the Chinese the males had a higher mean birth weight of 3.18 kg as against 3.11 kg and the Indian males had a mean birth weight of 2.90 kg as against 2.89 kg of Indian females.

DISCUSSION

The significance of recording birth weights is little realised in many countries. In the UN demographic year book of 1975 only 21 countries reported the incidence of LBW thus indicating the lack of data available on birth weights.

The importance of recording birth weights should be realised especially when birth weight is associated with many variables such as gestational age, maternal size and height, maternal age, parity, socio-economic status, education, smoking, nutritional status of the mother and morbidity during pregnancy. Birth weight is also being considered as a development indicator as compared to G.N.P. because it is considered to be a better indicator than G.N.P.

On going through relevant literature it is seen that very little work is done on birth weights in Malaysia (3, 4). In the present study the birth weight distribution among the various ethnic groups has been described. Majority (72.7%) of the births were born in the range of 2500 gm — 3500 gm. Only 145 (11.8%) of the babies born were below 2500 gm or L.B.W.

MEAN BIRTH WEIGHTS

In most countries well-to-do families and communities have a higher mean birth weight and lower proportion of small-for-date babies than do the poor segment of the population. This has been reported in many studies in developing countries. In a large scale study in Aberdeen primiparae from 1951 to 1959, the incidence of LBW in social class "1" and "2" was 5-6% whereas it was 11% in social class "4" and "5" (5).

The present study showed that mean birth weight for the total deliveries was 3.03 kg. The overall mean birth weight for males was 3.05 kg and for females was 3.00 kg. (Table 5). The Chinese babies had a higher mean birth weight than the Malays and Indians. Thus the Chinese babies were comparatively larger than the other races and this could be due to several factors including socio-economic status, nutritional status, maternal size and height, educational status. The mean birth weight for the Indian babies was 2.83 kg which was the lowest and this may be explained by the fact that the Indian mothers come from comparatively lower socio-economic status. The mean birth weight for Malay babies was 2.97 kg which was higher than the Indian but lower than the Chinese babies. In a similar study (3) the mean birth weight of Malays babies was 3.114 kg, the Chinese 3.141 kg and the Indians 2.910 kg. Also in Singapore Chen (4) showed that the mean weight of Chinese babies born in the hospital was 3.120 kg. and Malays 3.091 kg and Indians 2.964 babies. Thus it goes to show that mean birth weight of Chinese babies is always higher compared to the Indians and Malays and the Indian babies constitute the lowest mean birth weight.

LOW BIRTH WEIGHTS

It is estimated that 21 million LBW babies was born through-

TABLE 1: Birth weight distribution by Ethnic group and Sex

Ethnic group		Weight in grms.										
		< 1000gm	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4499	>5000	Total
Malay	Male	—	3	9	21	75	94	23	2	—	—	227 (18.5%)
	Female	—	7	8	17	72	84	24	4	—	—	216 (17.6%)
Chinese	Male	—	1	5	14	53	140	66	4	1	—	284 (23.1)
	Female	—	1	3	10	68	116	35	4	1	—	238 (19.3)
Indian	Male	—	1	4	21	46	46	17	—	—	—	—135 (11.0)
	Female	—	1	6	13	52	47	8	—	—	—	127 (10.3)
TOTAL:		—	**14 (1.1%)**	**35 (2.8%)**	**96 (7.8%)**	**366 (29.8%)**	**527 (42.9%)**	**173 (14.0%)**	**14 (1.1%)**	**2 (0.16%)**	—	**1227 (99.9%)**

all males : all females
646 : 581
1.1 : 1

TABLE 2: Birth weight by Sex for Malays

Sex	Weight in grms.										
	1000gm	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-5000	5000	Total
Male	—	3	9	21	75	94	23	2	—	—	227 (51.2%)
Female	—	7	8	17	72	84	24	4	—	—	216 (48.7%)
TOTAL	—	**10 (2.2%)**	**17 (3.8%)**	**38 (8.5%)**	**147 (33.1%)**	**178 (40.1%)**	**47 (10.6%)**	**6 (1.3%)**	—	—	**443 (99.9%)**

X^2 3.1603
df = 6
p >0.05

Male : Female
227 : 216
1.05 : 1

TABLE 3: Birth weight by Sex for Chinese

Sex	Weight in grms.										
	1000gm	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4999	5000gm	Total
Male	—	1	5	14	53	140	66	4	1	—	284 (54.4%)
Female	—	1	3	10	68	116	35	4	1	—	238 (45.5%)
Total	—	**2 (0.38%)**	**8 (1.5%)**	**24 (4.5%)**	**121 (23.1%)**	**256 (49%)**	**101 (19.3%)**	**8 (1.5%)**	**2 (0.38%)**	—	522 (99.9%)

$X^2 = 10.8463$ Male : Female
df = 7 284 : 238
p>0.05 1.19 : 1

TABLE 4: Birth weight by Sex for Indian babies

Sex	Weight in grms.										
	1000gm	1000-1499	1500-1999	2000-2499	2500-2999	3000-3499	3500-3999	4000-4499	4500-4999	5000gm	Total
Male	—	1	4	21	46	46	17	—	—	—	135 (51.5%)
Female	—	1	6	13	52	47	8	—	—	—	127 (48.4%)
Total:	—	**2 (0.7%)**	**10 (3.8%)**	**34 (12.9%)**	**98 (37.4%)**	**93 (35.4%)**	**25 (9.5%)**	—	—	—	262 (99.9%)

$X^2 = 6.1555$ Male : Female
df = 5 135 : 127
p>0.05 1.06 : 1

TABLE 5: Mean Birth Weight, Std. Deviation and Std. Error of Mean amongst various ehtnic groups in Malaysia.

	Malays			Chinese			Indians			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Number (N)	227	216	443	284	238	522	135	127	262	646	581	1227
Mean (X)	2.99	2.95	2.97	3.18	3.11	3.15	2.90	2.89	2.83	3.05	3.00	3.03
Std. Deviation	± 0.33	± 0.52	± 0.43	± 0.65	± 0.38	± 0.56	± 0.57	± 0.26	± 0.41	± 0.43	± 0.39	± 0.52
Std. Error of Mean	0.02	0.03	0.02	0.03	0.02	0.02	0.04	0.02	0.02	0.01	0.01	0.01

out the world each year, and almost 20 million in developing countries. LBW is the main contributing factor in Perinatal mortality and immediate and long-term morbidity it is clear that the problem of LBW is one of the most serious challenge in Public Health, particularly in MCH in both developing and developed countries (6). There is also some evidence to suggest that the higher proportion of LBW babies born in developing countries reflect, in fact, adverse environmental influences before and during pregnancy which result in majority of small for date infants. LBW is by far the most reliable quantitative parameter in considering long-term comparative studies on morbidity as related to different care policies. LBW is associated with increased perinatal and infant mortality and morbidity including adverse sequelae such as mental retardation and learning abilities (7).

In this study the overall incidence of LBW was 11.8% (Table 1). Although this is a hospital based statistics, the overall LBW incidence of all births in the district was 13%, thus the data from the present study was not very different. Jelliffe (8) also showed that the incidence of LBW was 4.5% in Sweden, 4.8% in New York and 6.9% in Birmingham, United Kingdom compared to 34.7% in Calcutta (India), 36% in Colombo (Sri Lanka) and 21.3% in Ibadan (Nigeria).

There were in all 145 babies born < 2500 gm from a total of 1227 deliveries. Overall LBW was 11.8% and Malay babies constituted 65 (44.8%) of the total LBW and the Indian babies constituted 46 (31.7%) and the Chinese constituted 34 (23.4%) which was the lowest.

Amongst the ethnic groups the LBW was highest amongst the Indian babies. From a total of 262 Indian babies 46 (17.5%) were LBW. Amongst the Indian babies the LBW of male Indian babies was 19.2% and the female Indian babies was 15.7%. Similarly the LBW was lowest amongst the Chinese babies. The Chinese had only 6.5% of their babies which were of LBW. The Chinese male babies LBW incidence was 7.0% and the female was 5.8%. The LBW amongst Malay babies was 14.6% and amongst the Malays the male had a LBW incidence of 14.5% as compared to female which was 14.8%.

Thus from this study the Chinese have a comparatively larger number of 'larger babies' (>2500 gm) as compared to the Malays and Indians. The LBW incidence amongst the Chinese is also very much lower compared to the Chinese and Indian. Thus the babies born to the Chinese can be compared to the babies born to the higher social class in European countries. 'The larger babies' could be due to several factors as mentioned earlier. It has also been shown LBW babies have a higher risk of mortality as compared to babies born with normal birth weight.

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