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Birth weights of infants of first generation Asian women in Britain compared with second generation Asian women

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Abstract

Objectives—To compare birth weights of infants of first generation Asian women (women born in the Indian subcontinent) with those of infants of second generation Asian women (born in the United Kingdom).

Design—Retrospective case note study.

Setting—Bolton District General Hospital.

Subjects—331 Asian women who gave birth between January 1989 and December 1989: 220 of these women were first generation Asians and 111 were second generation Asians.

Main outcome measure—Birth weights of babies born to first and second generation Asian women.

Results—At all gestational ages at delivery, babies born to second generation Asian women were heavier than those born to first generation women. The mean birth weight for babies of second generation women was 3196 g, 249 g more than the mean birth weight of 2946 g of babies of first generation women ($P<0{\cdot}001$). After a stepwise multiple regression analysis was carried out the adjusted difference in birth weights was 280 g, greater than the crude difference.

Conclusion—Birth weights are important in relation to perinatal mortality, which is notoriously high among Asians. The results of this study indicate that there is hope for lowering of perinatal mortality and improving postnatal growth in babies of second generation Asians.

Introduction

Mothers born in India contribute 1·3% of all live births in the United Kingdom, and mothers born in Pakistan contribute 1·8% of live births.[1] Studies have shown that Asian babies are lighter than white babies.[2-4] For Asian babies a birth weight of less than 2200 g seems to be associated with an increased risk of perinatal mortality.[2 5] This study was undertaken to compare birth weights of babies born to first generation Asian mothers (women born in the Indian subcontinent who subsequently immigrated to the United Kingdom) and birth weights of babies born to second generation Asian mothers (women born in the United Kingdom).

Subjects and methods

A total of 454 Asian women gave birth at Bolton District General Hospital between January 1989 and December 1989, and a sample of 331 patients was randomly selected from this group. Of this cohort, 220 patients were first generation Asian mothers, and 111 were second generation Asian mothers. The patients' records were scrutinised, and personal details were noted, including their height and weight at booking in, age, marital status, employment status, religion, place of birth, and smoking habits. Each patient's social class was determined according to her husband's or partner's occupation.

The obstetric details noted were menstrual history; date of last menstruation; use of oral contraceptives within three months of conception; parity; and outcome of previous deliveries, including mode of delivery and birth weight.

Gestational age at booking in was derived from each woman's menstrual history and an ultrasound scan performed at booking. The expected date of each delivery was calculated from the menstrual history provided the dates were sure and the menstrual cycles regular, there was no history of use of oral contraceptives in the three months before conception, and the date of delivery predicted from the ultrasound scan was within one week of the date predicted from the menstrual history. If any of the above criteria were not met then the results of the ultrasound scan were used to calculate the expected date of delivery.

Any complications that occurred before delivery were noted. A detailed record of labour was also noted, and fetal birth weight was recorded.

STATISTICAL METHODS

The birth weights of the babies studied followed an approximately normal distribution. The overall difference between the first and second generation groups was tested with a two sample Student's t test. The individual effects of potential confounding factors (such as parity and social class) on birth weight were examined with two factor analyses of variance; significant effects and interactions were examined in detail with the Tukey multiple comparison test. Forward stepwise multiple linear regression methods were used to evaluate the combined effects of the confounding factors.[6]

Results

The mean birth weight for babies born to first generation Asian mothers was 249 g less (95% confidence interval 137 g to 362 g) than that for babies born to second generation mothers. This difference was similar for both primiparous (342 g (128 g to 556 g)) and multiparous (314 g (181 g to 447 g)) mothers. Babies born to first generation mothers were significantly lighter on average than those born to second generation mothers for all subgroups examined (table). For both study groups, birth weights rose significantly with increasing parity, maternal age, maternal weight, and gestational age at delivery.

To ensure that the observed difference in crude birth weights was not due to factors other than the birthplace

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Comparison of birth weights of children of first generation and second generation Asian women by potential confounding factors

Factor	First generation women: Mean (SD) birth weight (g)	First generation women: No of women	Second generation women: Mean (SD) birth weight (g)	Second generation women: No of women	Statistical analysis*
Overall	2946 (474)	220	3196 (527)	111	t Test (329)=4·35, P<0·001
Parity†:					
0	2697 (425)	45	3039 (601)	50	(a) F(1·323)=23·21, P<0·001; (b) F(3·323)=6·779, P<0·001; (c) F(3·323)=0·265, P=0·851
1	2873 (422)	62	3324 (476)	38	
2	2917 (371)	36	3293 (324)	19	
3	3109 (485)	30	3517 (307)	3	
4	3112 (458)	26	3320	1	
≥5	3308 (548)	21		0	
Women's age (years):					
≤24	2833 (457)	60	3088 (529)	67	(a)F(1·323)=15·580,P<0·001; (b)F(3·323)=4·319, P=0·005; (c) F(3·323)=0·488, P=0·691
25-29	2987 (421)	95	3358 (567)	27	
30-34	2938 (588)	46	3371 (354)	12	
≥35	3117 (415)	19	3335 (295)	5	
Women's weight (kg):					
≤40	2798 (226)	6	2680 (273)	5	(a) F(1·323)=4·124, P=0·043; (b) F(3·323)=7·321, P<0·001; (c) F(3·323)=1·362, P=0·254
41-44	2646 (364)	19	3124 (752)	9	
45-49	2844 (413)	43	2972 (643)	20	
≥50	3018 (490)	152	3295 (440)	77	
Marital status‡:					
Single	2750	1	3010 (313)	8	
Married	2947 (475)	219	3210 (538)	103	t Test (320)=4·44, P<0·001
Gestational age (weeks):					
28-32	1628 (152)	2	1768 (822)	4	(a) F(1·323)=9·298, P=0·02; (b) F(3·323)=27·99, P<0·001; (c) F(3·323)=1·375, P=0·250
33-36	2152 (480)	7	2919 (289)	5	
37-40	2935 (397)	159	3230 (438)	75	
41-42	3138 (504)	52	3362 (419)	27	

*(a)=main effect of group (first generation v second generation; (b)=main effect of factor; (c)=interaction group×factor.

†Groups 3, 4, and ≥5 combined for statistical analysis.
‡Comparison made for married women only.

of the mother, birth weight was used as the dependent variable in a multiple regression analysis with maternal age, maternal height and weight at booking, religion, marital status, social class, menstrual history, use of oral contraception, cigarette smoking, parity, complications of pregnancy, and gestational age at delivery as independent variables. After adjustment for all factors, the effect of maternal birthplace remained significant, the mean birth weight of babies born to Asian women born in India and Pakistan being 280 g (95% confidence interval 162 g to 398 g) lighter than that for babies born to Asian women born in the United Kingdom.

Discussion

Attention has long been focused on the obstetric problems of immigrant Asians in the United Kingdom. Striking differences exist between these women and the indigenous population in terms of their obstetric performance. Asian women have a poor obstetric outcome, as measured by fetal birth weight, compared with their white counterparts. Social, economic, nutritional, and environmental factors are all known to influence pregnancy outcome.

Immigrant Asian women coming from the Indian subcontinent to the United Kingdom have given birth to daughters who have now reached childbearing age. These second generation Asian women have been exposed to an environment that is vastly different from that of their mothers. They have been better integrated within the community, with fewer language barriers to impede communication. Changes in dietary habits and cultural and religious beliefs can partly be ascribed to better educational opportunities available to the second generation. Improvement of socioeconomic status and better housing are offshoots of good education and hence better job opportunities.

This study shows that the second generation Asian women studied produced babies that were on average 280 g heavier than babies born to the first generation women. This difference in birth weights was present despite the fact that second generation mothers were younger and of lower parity and were more likely to be smokers, single, and employed (differences that should lead second generation mothers to have lighter babies). Previous studies have shown Hindu babies to be lighter than Muslim babies,[7] but in this study both groups contained a similar ethnic mix and were mainly Muslim (82% of first generation women and 76% of second generation women).

Birth weights of neonates are important, not only as indicators of fetal growth but also as reflectors of the health of the community as a whole. Thus the fact that British born Asian women produce babies whose weights are similar to those of the indigenous white population reflects a positive effect on the health of the immigrants from one generation to the next. Higher birth weights in the second generation group indicate a better intrauterine environment leading to improved fetal growth.

The high perinatal mortality among Asians has been ascribed to poor social economic status, high maternal parity and age, poor maternal nutrition and health, low fetal birth weight, and higher rates of congenital malformation. The second generation Asians in this study seem to have successfully eliminated one of these high risk factors by increasing fetal birth weight. This should contribute to a lowering of perinatal mortality. Fetal growth and postnatal growth are closely related, and studies have shown that British Asian babies that are lighter at birth compared with their white counterparts remain lighter throughout the first year of life.[9] With improved birth weights, the babies of the second generation Asian women are therefore assured of

Key messages

- Asian women immigrants tend to give birth to smaller babies than white women, and the smaller size seems to be associated with increased risk of perinatal mortality
- This study compared the birth weights of offspring of first generation Asian women (women born in the Indian subcontinent) with those of second generation Asian women (born in the United Kingdom)
- The second generation women gave birth to significantly heavier babies than the first generation women even after potential confounding factors were accounted for
- The results suggest that there is hope for lowering perinatal mortality in children of second generation Asians

improved postnatal growth. This may help to reduce the high infant mortality suffered by Asian groups.

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Fatal renal failure caused by diethylene glycol in paracetamol elixir: the Bangladesh epidemic

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Abstract

***Objective*—To determine the cause of a large increase in the number of children with unexplained renal failure.**

***Design*—Case-control study.**

***Setting*—Children's hospital in Dhaka, Bangladesh.**

***Subjects*—Cases were all 339 children with initially unexplained renal failure; controls were 90 children with cause of renal failure identified; all were admitted to hospital during 35 months after January 1990.**

***Main outcome measures*—Differences between the case and control patients in clinical and histological features and outcome; toxicological examination of 69 bottles of paracetamol from patients and pharmacies.**

***Results*—Compared with children with an identified cause for their renal failure, children with initially unexplained renal failure were significantly ($P<0\cdot05$) more likely to have hepatomegaly (58% *v* 33%), oedema (37% *v* 20%), and hypertension (58% *v* 23%); to have a higher serum creatinine concentration (mean 519 μmol/l *v* 347 μmol/l) and lower serum bicarbonate concentration (10·1 mmol/l *v* 12·4 mmol/l); to have been given a drug for fever (91% *v* 31%); to have ingested a brand of paracetamol shown to contain diethylene glycol (20% *v* 0%); and to have died in hospital (70% *v* 33%). Diethylene glycol was identified in 19 bottles of paracetamol, from 7 of 28 brands tested. In the 12 months after a government ban on the sale of paracetamol elixir, new cases of renal failure decreased by 54%, and cases of unexplained renal failure decreased by 84%.**

***Conclusion*—Paracetamol elixirs with diethylene glycol as a diluent were responsible for a large outbreak of fatal renal failure in Bangladesh.**

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Introduction

Diethylene glycol is a highly toxic organic solvent that causes acute renal failure and death when ingested.[1-3] Its toxicity became apparent when in the 1930s it was used to prepare a sulphanilamide elixir in the United States.[3] The deaths of at least 76 people from ingestion of this sulphanilamide elixir prompted the passage of the United States Food, Drugs, and Cosmetics Act in 1938, which regulates the evaluation and use of new drugs or foods.[4]

Diethylene glycol is still occasionally identified in medical preparations or foods, though rarely in lethal concentrations.[5-12] This report presents the results of investigations carried out in response to a large, initially unexplained epidemic of acute renal failure that was due to diethylene glycol poisoning.

Methods

PATIENTS

This study was conducted by Dhaka Shishu Hospital, the major children's hospital in the capital of Bangladesh. A dramatic increase in the number of patients with unexplained renal failure was noted in October 1990. Beginning in November 1990 possible causes for this increase were sought. Case records of patients admitted with renal failure from January 1990 onwards were reviewed, and information on all newly diagnosed patients with renal failure was recorded. Information obtained from patients' charts included history and physical examination findings and the results of complete blood counts, serum electrolye and creatinine concentrations, and blood culture, if performed. Nutritional status was assessed with standard criteria.[13] Hypertension was defined as mean arterial blood pressure above the 95th centile for age.[14]

Because toxin ingestion was suspected as the cause of the epidemic of renal failure, special attention was paid to identifying medicines taken before renal failure developed. This was done by questioning the child's parents and asking them to bring to the hospital for verification any medicines given to the child.

The most commonly identified causes of acute renal failure at Shishu Hospital are the haemolytic-uraemic syndrome, poststreptococcal glomerulonephritis, and acute tubular necrosis. All three conditions are usually readily diagnosed on the basis of history, physical examination, and laboratory findings. Patients in whom the cause of renal failure was not identified were considered to have unexplained renal failure.

TESTING OF SAMPLES

Paracetamol elixir was identified as the medicine most commonly taken before admission by patients developing unexplained renal failure. Samples tested by laboratories in Bangladesh did not identify the presence of toxic substances, so 69 samples of 28 brands of paracetamol were submitted on four occasions for analysis to the State Laboratory Institute of the Commonwealth of Massachusetts in Boston. Samples for analysis included three bottles from the stocks of the hospital pharmacy, 49 bottles purchased