to be approximately 30,000 (from figures provided by the Medical Officers of Health in the region and extracted from the 1971 census), a very rough estimate of the incidence of CF in this region among Asians is 1:10,000. No attempt has been made to determine gene frequency, because the data are so scanty and the immigrant groups have come mainly from small, well-defined areas of India and Pakistan where consanguineous marriages are common, though not always recognized as such.

Pakistanis are Caucasian by race, as are most of the inhabitants of the Indian subcontinent. If the high incidence of CF among populations of European origin is associated with their Caucasian race, then with increased awareness of the disease further cases may be found in India and Pakistan.

Summary

Three children, 2 of them brother and sister, whose parents were natives of West Pakistan, had cystic fibrosis. The present incidence of this disease among Asian immigrants in the West Midlands is approximately 1:10,000.

We thank Professor Charlotte M. Anderson for her advice on the preparation of this paper, Dr. H. McC. Giles for permission to investigate Case 3, Medical Officers of Health in the West Midlands for statistical information, and Miss Alison M. Howell for duodenal enzyme assay in Case 3. M.C.G. is in receipt of a grant from the Cystic Fibrosis Research Trust.

REFERENCES

- Harris, R. L., and Riley, H. D. (1968). Cystic fibrosis in the American Indian. *Pediatrics*, **41**, 733.
- Kramm, E. R., Crane, M. M., Sirken, M. G., and Brown, M. L. (1962). Cystic fibrosis pilot survey in three New England states. *American Journal of Public Health*, **52**, 2041.
- Kulczycki, L. L., Guin, G. H., and Mann, N. (1964). Cystic fibrosis in Negro children: results of a search. *Clinical Pediatrics*, **3**, 692.
- Mehta, S., Wadhwa, U. N., Mehta, S. K., and Chhuttari, P. N. (1968). Fibrocystic disease of pancreas in India. *Indian Pediatrics*, **5**, 185.
- Reddy, C. R. R. M., Devi, C. S., Anees, A. M., Murthy, D. P., and Reddy, G. E. (1970). Cystic fibrosis of pancreas in India. *Journal of Tropical Medicine and Hygiene*, **73**, 59.
- Wang, C.-I., Sumi, W. T., Stanton, R., Kwok, S., and Yamazaki, J. N. (1968). Cystic fibrosis in an oriental child. *New England Journal of Medicine*, **279**, 1216.
- Wright, S. W., and Morton, N. E. (1968). Genetic studies on cystic fibrosis in Hawaii. *American Journal of Human Genetics*, **20**, 157.

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Assessment of gestational age in twins

The reliability of a scoring system for the estimation of neonatal gestational age, based on 10 neurological and 11 external criteria, devised by Dubowitz, Dubowitz, and Goldberg (1970), has been confirmed by Brueton, Palit, and Prosser (1973), Jaroszewicz and Boyd (1973), and Singer, Blake, and Wolfsdorf (1973). In the original study by Dubowitz *et al.* (1970), 23 small-for-dates and 14 large-for-dates babies were included. The distribution of total score against gestational age of these infants seemed to fit the regression line and not to differ from that of appropriate weight-for-dates infants, though the authors did not specifically comment on this finding. In order to test the reliability of the method, this study was undertaken to estimate the gestational age of twins, with particular emphasis on pairs of twins with marked differences in birthweight.

Material and methods

Gestational age was estimated in 33 pairs of consecutive twins by the method of Dubowitz *et al.* All the estimations were done by one experienced examiner (A.M.J.) during the routine estimation of gestational age of newborns, as previously described (Jaroszewicz and Boyd, 1973). It was unavoidable that the examiner would sometimes know that twins were being examined. True gestational age was unknown in many of these pregnancies due to uncertainty about the date of the last menstrual period. The difference in birthweight between members of a twin pair was calculated as a percentage of the weight of the heavier twin.

Results

The results are shown in the Table where the pairs have been arranged in order of increasing birthweight differences in percent. The difference in the estimated gestational age (EGA) between the lighter and heavier of the twins varied between 0.0 and 2.0 weeks, with one exception, where the difference was 2.5 weeks (pair no 24). The lighter twin was not necessarily the one to show a lower EGA. The mean EGA of the 33 lighter twins was 36 weeks and of the 33 heavier twins 36.4 weeks. The difference between these two means is not significant ($P < 0.001$). In 7 pairs (pairs no. 27 to 33) the birthweight difference was more than 20%: the mean EGA of the lighter twins in this group was 37.2 weeks, and the mean EGA of the 7 heavier twins 37.5 weeks. This difference, too, is not significant ($P < 0.001$).

TABLE
Estimated gestational age (EGA) in 33 twin pairs

Twin pair identity no.	Lighter twin			Heavier twin			EGA difference (wk)	Birthweight difference (g)	Birthweight difference (% of weight of heavier twin)
	Sex	Birthweight (g)	EGA (wk)	Sex	Birthweight (g)	EGA (wk)			
1	F	2640	38.0	F	2670	38.0	0.0	30	1.12
2	M	1842	32.5	F	1871	33.0	0.5	29	1.54
3	F	1647	33.0	F	1673	33.0	0.0	26	1.55
4	F	2240	35.5	F	2296	36.0	0.5	56	2.44
5	M	2353	38.0	M	2438	38.0	0.0	85	3.49
6	M	2296	38.5	F	2381	38.5	0.0	85	3.57
7	M	2523	38.0	M	2637	38.0	0.0	114	4.32
8	F	3006	38.0	F	3175	38.5	0.5	169	5.32
9	M	1928	34.0	M	2041	34.0	0.0	113	5.54
10	M	1814	34.0	F	1928	32.0	2.0	114	5.91
11	F	2550	36.5	F	2722	37.0	0.5	172	6.32
12	F	1972	36.5	M	2126	38.0	1.5	154	7.24
13	F	1701	35.0	F	1843	34.5	0.5	142	7.70
14	M	2495	36.0	M	2722	37.0	1.0	227	8.33
15	M	2722	38.0	M	2977	36.5	1.5	255	8.57
16	F	2722	38.0	M	3034	38.5	0.5	312	10.28
17	M	2948	36.5	M	3289	38.5	2.0	341	10.36
18	M	1332	32.5	F	1503	31.5	1.0	171	11.38
19	F	2041	33.0	M	2353	35.0	2.0	312	13.26
20	F	2580	38.0	M	2977	40.0	2.0	397	13.33
21	F	2320	35.5	M	2700	36.5	1.0	380	14.07
22	F	2722	37.0	F	3203	37.5	0.5	481	15.02
23	M	1162	31.0	F	1368	30.5	0.5	206	15.06
24	M	2098	35.5	F	2552	38.0	2.5	454	17.79
25	F	1899	38.5	M	2353	38.5	0.0	454	19.29
26	M	1588	36.0	F	1981	38.0	2.0	393	19.84
27	F	1758	37.5	M	2221	36.5	1.0	463	20.85
28	M	2665	36.0	M	3430	36.5	0.5	765	22.30
29	F	2381	37.0	M	3147	38.5	1.5	766	24.35
30	M	2297	39.5	M	3232	40.5	1.0	935	28.93
31	F	2084	36.0	M	2977	37.0	1.0	893	29.99
32	F	1531	33.0	M	2324	34.0	1.0	793	34.12
33	F	1549	34.5	F	2695	33.0	1.5	1146	42.52
Mean EGA			36.0			36.4			

Discussion

Many of the mothers in this study were uncertain about the dates of their last menstrual periods, so it was not possible to determine the true gestational age of the babies. If it is assumed, however, that the weight of the heavier infants is appropriate for gestational age, these bigger infants can be considered the perfect controls for the lighter infants, who are of the same gestational age but smaller in size; and in the twin pairs with marked weight differences between the two members of a pair the lighter one must then be considered small-for-dates. Despite this, there was no significant difference between the mean EGA of the lighter and heavier twins, even in the group where the birthweight difference between two members of a twin pair exceeds 20%. The method used for estimating gestational age can therefore be considered reliable.

Summary

Gestational age was estimated by the method of Dubowitz *et al.* (1970) in 33 pairs of twins. In spite

of marked differences of up to 20% in birthweight between the two members of a twin pair, the mean estimated gestational age of the heavier twins did not differ significantly from the mean estimated gestational age of the lighter twins.

REFERENCES

- Brueton, M. J., Palit, A., and Prosser, R. (1973). Gestational age assessment in Nigerian newborn infants. *Archives of Disease in Childhood*, 48, 318.
- Dubowitz, L. M. S., Dubowitz, V., and Goldberg, C. (1970). Clinical assessment of gestational age in the newborn infant. *Journal of Pediatrics*, 77, 1.
- Jaroszewicz, A. M., and Boyd, I. H. (1973). Clinical assessment of gestational age in the newborn. *South African Medical Journal*, 47, 2123.
- Singer, B., Blake, L., and Wolfsdorf, J. (1973). Estimation of gestational age of African newborn infants by a scoring system. *South African Medical Journal*, 47, 2074.

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