Abnormal haemoglobins among pregnant women from Mozambique

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SUMMARY In a survey of 601 pregnant women in Mozambique, 34 (5.6%) were sickle cell trait carriers. β thalassaemia trait did not appear to be common. There was a slight rise in Hb F values in 49 women of the type reported previously in early pregnancy.

Published data on the frequency of abnormal haemoglobins in Mozambique are nowhere near as extensive as from other areas of tropical Africa¹ and date mainly from colonial times. We have recently carried out a population survey for haemoglobin variants among pregnant women in Mozambique as part of a larger study of anaemia in pregnancy.²

Blood samples were collected from 601 women. Standard methods of haemoglobin electrophoresis and identification of structural variants were used.³ Fetal haemoglobin levels and Hb A₂ concentrations, for the recognition of β thalassaemia trait, were determined as described by Weatherall and Clegg.⁴

Two major structural haemoglobin variants were observed, haemoglobin S and a variant that was probably haemoglobin D (table). There was good agreement between observed and expected numbers of haemoglobin phenotypes assuming Hardy-Weinberg equilibrium. Two haemolysates showed a minor haemoglobin fraction electrophoretically similar to Hb A₂'.

The mean Hb A₂ concentration was 2.3%, SD 0.45. Two values (4.3%, 4.6%) were within the limits normally associated with β thalassaemia trait. There was a slight rise of Hb F concentrations in the range 1 to 3% in 49 samples. No values were within the range normally associated with African pan-cellular hereditary persistence of fetal haemoglobin.

The results show a fairly low frequency of sickle cell trait (5.6%) compared to many other areas in Africa. Although the sample is small, there is an indication of a lower frequency of haemoglobin S in southern Mozambique (Changane ethnic group) than in other areas, also noted by Almedia,⁵ suggesting that the sickle cell gene was introduced into southern Africa at a fairly late stage of the Bantu migration. Although there was no suggestion of an appreciable frequency of β thalassaemia trait among these pregnant women, Nowicki *et al*⁶ earlier estimated a gene frequency of 0.037 in a predominantly male population in Mozambique. Iron deficiency, although widespread among the pregnant women,² is unlikely to have affected the results. Galanello *et al*⁷ found that Hb A₂ levels in iron deficient β thalassaemia trait carriers, although reduced, were always in the range associated with β

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TABLE Haemoglobin variants among pregnant women from various locations in Mozambique.

Location	Ethnic group	AA	AS	AD	Number examined
North coast	Maconde and Arab	67	4	0	71
North	Macua	115	11	1	127
North	Ajaua	40	1	0	41
North	Lomué and Macua	58	4	0	62
Central	Shona	209	14	0	223
South	Changane	77	0	0	77
Total: observed		566	34	1	601
expected		566.53	33.03	0.93	

Gene frequency: A, 0.9709; S, 0.0283; D, 0.0008.

thalassaemia trait. Obviously, further investigations are needed.

The comparatively large numbers of blood samples showing an increase in Hb F levels is consistent with the observation of Pembrey *et al*⁸ who reported a sharp temporary rise in Hb F levels in around 17% of pregnant women at 8 to 12 weeks' gestation. In addition, all populations appear to have a small number of subjects with persistence of small amounts of Hb F.⁴

References

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⁷ Galanello R, Ruggeri R, Addis M, Paglietti E, Cao A. Hemoglobin A₂ in iron deficient β -thalassemia heterozygotes. *Hemoglobin* 1981;5:613-8.

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