Absence of the α -thalassaemia syndromes in Egyptian Arabs

O. SELIM, K. KAMEL,* F. SABRY, A. IBRAHIM, and D. J. WEATHERALL

From The Clinical Pathology Department, Ain-Shams University Medical School, Abbassiah, Cairo, Egypt; El-Galaa Maternity Hospital, Egyptian Ministry of Public Health; and The Department of Haematology, The University of Liverpool, United Kingdom

Summary. An investigation was undertaken to find the incidence of α -thalassaemia in Egypt. Blood was collected from the umbilical cords of 550 newborns and from 630 adults from central hospitals in Cairo that drain patients from all over Egypt.

Starch gel electrophoreses at both pH 8.6 and 7.0, and brilliant cresyl blue incubation revealed the absence of haemoglobins Barts and H in the blood specimens examined.

While much is known on the genetic, clinical, and chemical variations of the β -thalassaemias and their combinations with other haemoglobinopathies, corresponding information on the α -thalassaemias is at best fragmentary and unclear.

It is now an accepted fact that haemoglobins Barts and H result from a reduction of α -chain synthesis, leading to an excess of either γ or β chains, and hence to the formation of γ_4 and β_4 molecules, respectively.

The incidence of Hb Barts in cord blood is generally believed to be a reliable index of the prevalence of α -thalassaemias in a population (Weatherall, 1963). The frequency of Hb Barts in some ethnic groups of the old world has been reported and varies widely between them (Weatherall and Clegg, 1972). The occurrence of 49.0% of Hb Barts in people of the religious sect, 'The Shiite' (Sheeah) in Saudi Arabia (D. J. Weatherall, R. P. Perrine, and J. R. McNeil, unpublished observations, cited in Weatherall and Clegg, 1972), was interesting and instigated the search for this condition in other Arab populations.

This article presents investigations on the incidence of α -thalassaemias in Egypt which comprises about one third of the populations of all Arab

nations, with the hope that such information would throw more light on these conditions.

Materials and methods

Five hundred and fifty cord blood samples were collected from El-Galaa Maternity Hospital in Cairo which is a major referral hospital draining maternity cases from all over the country. Heparinized blood samples were usually kept refrigerated overnight and processed during the next day at Ain-Shams University Laboratories.

Blood specimens were also harvested from 630 adult subjects presenting to the out patient clinics of Ain-Shams University Hospitals for various procedures. All specimens were taken from both sexes.

The brilliant cresyl blue incubation was carried out for the detection of Hb-H inclusion bodies. Horizontal starch gel electrophoresis was made in tris-EDTA borate buffer system at pH 8.6 and in phosphate system at pH 7.0, the latter for the specific identification of Hb H and Hb Barts. Benzidine or orthodianisidine stain of sliced gels was applied to detect minor electrophoretic fractions. Techniques used are outlined in Weatherall and Clegg (1972).

Results

Among the 550 cord blood samples examined none showed Hb Barts in any unequivocally visible proportion on the stained starch gels. From the total specimens of 1180 none had Hb H by inclusion body stains and by electrophoretic techniques employed.

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* Present address and address for reprints: Sickie Cell Center, Medical College of Georgia, Augusta, Georgia 30902, USA.

Conclusions

The only available report on Hb Barts in Arabs is the one reported above in the Sheeah people of Saudi Arabia. The Arabian peninsula is the largest in the world. It is underpopulated, and various communities in it are separated by vast areas of barren desert, a situation which is most favourable for inbreeding of genetic traits. It is therefore interesting to speculate on the incidence of this haemoglobin in other parts of Saudi Arabia. However, the absence of Hb Barts in 550 Egyptian newborns suggests it is likely that this Hb is rare in other Arab communities.

Hb H had been sporadically detected in Syrian and Kuwaiti Arabs (Ali, 1969). The scarcity or absence of Hb H in Egypt is substantiated by a similar finding in surveys and studies which covered the majority of Egyptian territories (Kamel *et al*, 1960; Awny, Kamel, and Hoerman, 1965; Kamel, 1968; Azim *et al*, 1974; Ibrahim *et al*, 1974; Selim *et al*, 1974) as well as in neighbouring Libya (Kamel *et al*, 1975).

It is possible that complete blood counts, indices calculations, and osmotic fragility tests may reveal some mild and/or rare forms of α -thalassaemia in those areas.

The allied disorder, β -thalassaemia has been reported in its homozygous form in 1/350 paediatric patients examined in Cairo (Kamel *et al*, 1960). In adjacent Libya this condition was not detected in two surveys (Weatherall *et al*, 1971; Kamel *et al*, 1975).

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