

Cu-IUD has been reported to have better contraceptive efficacy than the other IUCDs. The antifertility effect is due to the catalysing property of copper as it participates in a number of enzymatic reactions under normal and physiological concentrations⁹. The biochemical and enzymological responses to intra-uterine devices have been noticed only in the treated cornua, the control cornua remaining as usual^{10,11}. It has been suggested that the effect of IUCD is localised and is of neurogenic origin¹². Further, it interplays through hypothalmo-hypophyseal centres. This hypothesis was upheld by Tatum⁶, who reported that copper content of liver, lung, etc., remains unaltered in the presence of Cu-IUD. The effect of copper seems to be local as evidenced by normal implantation in the contralateral cornua¹.

The authors are thankful to Prof. S. M. Alam, Head of the Department of Zoology, Aligarh Muslim University, Aligarh, for providing necessary laboratory facilities.

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September 22, 1975 (Revised: 28-1-1976).

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BETA-THALASSAEMIA TRAIT IN WEST BENGAL—A METHODOLOGICAL STUDY

THE two components of normal human haemoglobin are (1) a major one (HbA) and (2) a minor (HbA₂). In the detection of the beta-thalassaemia trait, rise in the HbA₂ proportion is usually recorded¹. Several methods are available for its detection, involving amongst others, electrophoresis of haemoglobin on starch², paper³, starch gel⁴, cellulose acetate⁵ and filter paper⁶. However, they are rather time-consuming and not suitable for screen-

ing large populations. Disc polyacrylamide gel electrophoresis has been found to have a much greater possibility for haemoglobin identification on a large scale⁷. A technique has been described here, based on polyacrylamide vertical disc electrophoresis with suitable concentrations gel and buffer systems, for the detection of the beta-thalassaemia trait. Since it is simple and rapid, it has been used successfully in scanning a large number of samples during population studies.

Procedure

Red cell haemolysate (10 g/100 ml) was prepared by the standard procedure. A stock solution A (acrylamide 20 g/100 ml, methylene bis-acrylamide 0.53 g/100 ml) and another solution B (pH 8.8, 17.15 g tris and 24 ml NHCl/100 ml) with 0.4 ml N, N, N', N'-tetramethylethylene diamine, were prepared. One part of A was added to 2 parts of B, followed by one part of aqueous ammonium persulphate (0.48 g/100 ml) and the mixture was immediately transferred to glass tube (12 cm × 0.5 cm), fitted at one end with rubber caps, upto a distance of 8.0 cm. The gel was allowed to stand vertically for 30 min for setting after adding a drop of water to the upper surface to level the meniscus. A drop of bromophenol blue indicator in 2M sucrose solution was added to each tube. 20 µl of the haemolysate was applied to the gel surface after dissolving a few crystals of sucrose in the former to retard diffusion. Bridge buffer (pH 8.3, tris 0.6 g and glycine 2.38 g in 100 ml, made upto 1 litre) was poured into both the electrode chambers. Electrophoresis was carried out with a current of 4 mA per tube for a period of 120 min or upto the migration of the bromophenol blue to 6 cm from origin, at 22° C. Three sets, each containing 8 tubes, could be processed per power pack in a single day. Since HbA₂ moves more slowly than HbA, it can be observed as a distinct band 5 mm above the upper limit of HbA. The band given by HbA₂ was cut out with the help of a gel cutter, prepared by attaching two razor blades 5 mm apart in a cork. It was transferred to a tube containing 0.5 ml Drabkin's solution, macerated and kept overnight at 4° C. The HbA and other bands of haemoglobin were similarly cut out and eluted separately in 1 ml of Drabkin's solution. Measurements of the cyano-haemoglobin contents of the respective haemoglobins were made in a spectrophotometer at 420 nm (Beckmann model B 20). Originally the final dilutions of HbA and HbA₂ were kept equal to each other and different dilutions of HbA were tested but no significant variations were observed in the results. The readings of HbA₂ and the other fractions were taken in separate sittings on the same day.

TABLE I

The incidence of HbA₂ and slow moving Hb in normal population in West Bengal

Sex	Total No. analysed	No. with 1-4% HbA ₂	No. with 4-6% HbA ₂	No. with slow moving Hb (20-40%)
Male	113	101	8	4
Female	92	79	10	3
Mean	..	2.03	4.83	24.10
S.D.	..	±0.77	±0.71	±5.21

Results

The total number of samples worked out was 205, of which 180 cases showed HbA₂ range from 1 to 4% of the total haemoglobin, as consistent with the earlier reports from India⁸. There was no difference between male and female samples. 10 females and 8 males, forming 8.78% of the total, showed a range between 4-6% of HbA₂. These were investigated fully and found to be beta-thalassaemia trait cases and form the subject of a separate communication. Seven cases, 3 female, and 4 males, forming 3.36%, showed the presence of the slow moving band ranging from 20 to 40% of the total haemoglobin. Subsequent studies on the haemoglobin pattern of beta-thalassaemia and thalassaemia variants have demonstrated that the method can be used effectively in the determination of these traits.

The authors would like to express their thanks to Professor A. K. Sharma, Head of the Department of Botany, University of Calcutta and Dr. K. P. Sen Gupta, Director, Department of Pathology, Institute for Post-Graduate Medical Education and Research, Calcutta, for encouragement and facilities provided and to the CSIR (India) for the award of a Junior Fellowship to Miss M. Ajmani.

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CHLOROPHYLL STABILITY OF BRINE AND FRESHWATER ALGAE

DURING our work on the effect of stress, we studied the chlorophyll stability index (CSI) of some algae. CSI indicates the stability of photosynthetic pigments when organisms are exposed to a high temperature, (65°C). In higher plants, CSI has been taken as an indicator of resistance to draught^{1,2}. Purushothaman *et al.*² recently reported CSI of several algae, including one blue-green alga, grown in cultures.

The algae *Dunaliella salina*, *Schroederia setigera* (Schroeder) Lemm., *Anabaena fertilissima* and *Anabaenopsis arnoldii* were isolated from the salt lakes of Sambhar, Rajasthan. They were cultured in artificial sea water medium (Pringsheim)³ containing 1% sodium chloride except for *D. salina* which was grown at 3% concentration. *Anabaena ambigua* and *Anabaenopsis circularis* (Watanabe strain) were cultured in Allen and Arnon's medium. *Microcystis aeruginosa* was collected from local temple tanks. CSI was determined by the method described by Purushothaman *et al.*². The results are given in Table I.

The following conclusions can be drawn from our results. Among the brine algae, isolated from Sambhar salt lakes, the blue-green forms *A. fertilissima* and *Anabaenopsis arnoldii* showed high stability of their pigment at 65°C, and also the Chlorococcalean alga, *S. setigera*, to some extent. *D. salina* a Chlorophyceean alga, was found to be highly sensitive to temperature. The blue-green algae generally found in freshwater habitats, *A. ambigua*, *A. circularis* and *M. aeruginosa* a perennial bloom of polluted temple tanks also contain pigments resistant to higher temperature.