The fact that many cases of Kaposi's sarcoma are not accompanied by thrombocytopenia does not imply that the two conditions cannot be related. Kaposi's sarcoma is diagnosed from a variety of clinical and histological lesions and covers a very broad spectrum ranging from benign vascular endothelial hyperplasia to frank malignant proliferation with metastases.

Addendum
Results of investigations (22.10.69): Platelet count 332,000/mm³. Prothrombin ratio 100%. Partial thromboplastin time 29 sec (normal). Euglobulin lysis time more than 2 hours (normal). Fibrinogen 400 mg/100 ml. – A T and J A.

The following cases were also presented:

(1) **Sex-linked Ichthyosis**
(2) **Lichenoid Atopy in a West Indian Child**
(3) **Lymphangioma**
Dr J S Pegum

Lichen Planus Actinicus
Dr John Almeyda (for Dr Harvey Baker)

Actinic Reticuloid with Lymphoma
Dr N E Jensen (for Dr I B Sneddon)

Widespread Granuloma Annulare
Dr J L Verbov (for Dr P F Borrie)

Meeting November 20 1969

Cases

Familial Hypercarotinæmia and Hypovitaminosis A
D E Sharvill MRCP
(*Buckland Hospital, Dover*)

Mrs J W, aged 41. Housewife
History: She complained of increasing yellowness of the skin for a year, her general health remaining good. She had always disliked carrots and had eaten them only in very small quantities and infrequently, none during the previous eight months. She took normal helpings of green vegetables and no excess of any food rich in carotene. No member of her family had yellow skin or any illness which appeared relevant.

On examination: The skin generally presented a yellow appearance, more orange than that seen in jaundice and varying from day to day and according to ambient light. It was most marked on palms and soles, especially pressure areas, sparing the creases. The palms showed a few small callosities, but no diffuse hyperkeratosis. There were thickened, yellow plaques over the dorsa of the ankle joints, suggesting pigmented lichen simplex. The skin did not fluoresce under Wood's light. The scleræ were white and specialist examination showed no abnormality suggestive of vitamin A deficiency. She was overweight but general examination revealed no other abnormality. She appeared to be of above average intelligence and of normal personality.

Investigations: The following tests were normal or negative: Hb, blood films, urinary glucose, glucose tolerance, serum proteins and electrophoresis, PBI, liver function tests, serum cholesterol and triglycerides, fæcal fats, serum folate and vitamin B_{12}, blood urea, calcium, phosphorus.

Fresh serum fluoresced bright green under Wood's light. Electrophoresis of serum lipoproteins showed an increase in α-lipoprotein. Low density lipoprotein 790 mg/100 ml (normal 450–650).

Serum carotene (10 tests): mean 795, range 568–975 µg/100 ml (normal for sample of local population 70–180, published normals 50–200). Serum vitamin A:74–143 i.u./100 ml (normal 80–200). Vitamin A absorption test normal. Chromatography: see report below by Dr I M Sharman.

Investigation of family: Her mother, one of her three siblings and her only son had serum carotene levels persistently above 200 µg/100 ml. A maternal aunt and two siblings were normal. On occasions some of these relatives had low or very low vitamin A levels, but these were on other occasions normal, without obvious dietary explanation. Her mother and son had single readings as low as 18 and 20 i.u./100 ml and it seems unlikely that these were due to technical error.

Comment

This patient is unusual because of the persistently very high carotene while on a normal diet; her levels are among the highest ever recorded. In Cohen's extensive review (1958) patients eating as much as 4–8 lb (1·8–3·6 kg) of carrots daily had levels up to 500 µg/100 ml, associated with high vitamin A. In this family four members out of six examined in three generations had persistently high carotene, and occasionally low vitamin A. Cohen described a 'unique' case, a woman of 38 with raised carotene and low vitamin A. Frenk (1966) described a family in which 2 of 3 children of normal parents had similar biochemical abnormalities, but of lesser degree, associated with a diffuse keratodermic state, and mentioned one other patient who said that her mother had similar skin. It seems possible that this is a genetic disorder in which moderately elevated serum carotene causes no clinical disturbance. Possibly, too, there is an abnormality of conversion of β-carotene into vitamin A, or, perhaps, of storage of vitamin A. Unfortunately, it seems doubtful whether this can be pursued further without unjustifiable disturbance to the patient and her family.

Acknowledgments: I wish to thank Mr N Saunders for numerous, time-consuming investigations, and Dr I M Sharman for his special investigations.

REFERENCES

Frenk E (1966) *Dermatologica (Basel)* **132**, 96

Cohen (Lord) (1958) *Ann. Int. Med.* **48**, 219

Dr I M Sharman (*Dunn Nutritional Laboratory, University of Cambridge and Medical Research Council*): I analysed blood specimens from the mother in this case, and found very high figures for total carotenoids but low normal values for vitamin A. A recent specimen contained carotenoids 481 and vitamin A 47·5 µg/100 ml plasma. Of the carotenoids 333 µg β-carotene was found by chromatographic analysis. The high percentage (69·3%) of β-carotene is in keeping with other reported cases of hypercarotinæmia. The β-carotene is identified by the three characteristic absorption peaks (Fig 1).

Examination of the extract in the ultraviolet region showed a remarkably high absorption at about 275 nm. Similar observations were reported by Le Page & Pett (1941, *J. biol. Chem.* **141**, 747), who suggested that at this wavelength an oxidation product of vitamin A might occur in extracts of blood from human subjects heavily dosed with vitamin A.

High carotene levels found in the blood in this case might be explained by failure of conversion to vitamin A. A build-up from the small dietary intakes of carotene might then be possible. Normally carotene is converted to vitamin A in the intestinal wall. There are two current theories for the breakdown of the carotene molecule to vitamin A.

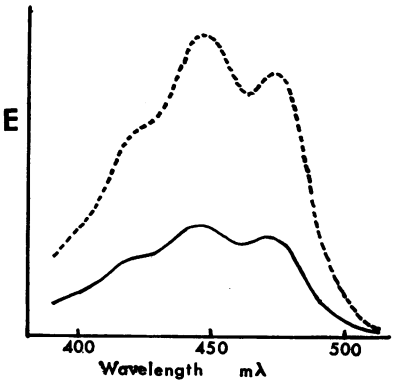

Fig 1 *Extinction curves of extract prepared from patient's plasma* (———) *compared with that for pure β-carotene* (- - - -)

According to one theory (Karrer *et al.*, 1931, *Helv. chim. Acta* **13**, 1036, 1431) vitamin A is formed by a hydrolytic cleavage of the central double bond of the β-carotene molecule whereas in the other, the so-called 'β-oxidation theory' (Glover & Redfern, 1954, *Biochem. J.* **58**, xv) cleavage may start at either end of the ethylenic chain. The oxidation continues progressively removing two-carbon units until a C_{20} unit is reached.

Dr Sharvill: I was advised by an ophthalmologist colleague that tests of night vision are not simple and might give misleading results if carried out by those unfamiliar with them. The patient and members of her family have had no difficulty getting about at night, nor during the wartime blackout.

Dr B C Tate: In cœliac disease and other cases of fat intolerance carotene used to be given instead of vitamin A. By this means adequate blood levels of vitamin A were maintained and no hypercarotinæmia resulted.

Dr M L Johnson: Since the conversion of carotene to vitamin A occurs mainly in the intestine, there is an analogy here with Fabry's disease where the absence of ceramidetrihexosidase in the gut can be demonstrated in jejunal biopsy specimens (Brady *et al.*, 1967, *New Engl. J. Med.* **276**, 1163). A jejunal biopsy in the patient might be expected to show lowered activity of the relevant enzymes when compared with normal controls.