Obianwu and M. J. Rand[2] on the relationship between the mydriatic action of ephedrine and the colour of the iris has provided further information of interest. These workers compared the mydriatic action of 3% ephedrine hydrochloride drops in sixty European, Indian, Chinese, and African students, and found that the mydriatic response was inversely proportional to the degree of pigmentation of the iris. Europeans with light-coloured irides were the most sensitive and every subject reacted, whereas Europeans with brown irides were considerably less sensitive. Obianwu and Rand formed the impression that the iris was most heavily pigmented in Africans and that the hue of the iris of the Chinese was on average deeper than that of Indians. But the response to ephedrine depended primarily on the depth of colour of the iris, and on the person's race only in so far as that determined the colour.

Obianwu and Rand also noted that the diameter of the resting pupil was smaller in subjects who failed to respond or gave poor responses to ephedrine than in those who responded well, and they thought this might be because the drug had to overcome a specially strong contraction from the light reflex in more deeply pigmented eyes. It would thus appear wise when dilating a deeply pigmented iris with an adrenergic drug to combine it with a mild parasympatholytic agent (such as homatropine or euphthalmine) to neutralize the miosis of the light reflex. Such a combination of drugs with a relatively weak and transient action is particularly valuable in producing a mydriasis sufficient to facilitate routine examination of the fundus without prolonged visual impairment.

In persons susceptible to closed-angle glaucoma it should be remembered that mydriatics are contraindicated, since the crowding of the iris into a narrow angle of the anterior chamber may result in complete blockage of the drainage channels and consequent rise in intraocular pressure. For this reason mydriatics should be avoided in adults over 40 when the anterior chamber is shallow and its angle narrow, but if they must be used their effect should be seen to be neutralized by a miotic before the patient is dismissed.

Favism in Britain

The report of another two cases of favism in children in Britain[1] is a timely reminder of the necessity to keep the possibility of this diagnosis constantly in mind. *Vicia fava*, the broad bean, contains a substance capable of producing a haemolytic episode when eaten, or when its pollen is inhaled, by a susceptible person.[2] Raw beans are more toxic than cooked, but even the tops used as a green vegetable have caused trouble.[3]

Favism has been known since early times among peoples of the Mediterranean littoral. It was as a result of a suggestion by W. H. Crosby in 1956[4] that its association with deficiency of the enzyme glucose-6-phosphate dehydrogenase (G6PD) was discovered. G6PD is a key enzyme in erythrocyte metabolism. Complete or nearly complete absence of it results in constant haemolysis, and cases of this type of non-spherocytic congenital haemolytic anaemia have been described in persons of British ancestry.[5,6] The presence of only a very small amount of the enzyme seems to be sufficient to allow apparently normal health and the maintenance of normal levels of haemoglobin, though careful studies have shown that the life-span of the red cells is slightly shorter than normal.[7] When persons with red cells deficient in G6PD are exposed to certain toxic substances the rate of haemolysis increases. In addition to the broad bean other foods such as whortleberries, and many drugs, including certain antimalarials, sulphonamides, and many simple analgesics, may induce haemolysis (a comprehensive list is given by A. G. Motulsky[8]).

The gene controlling the inheritance of G6PD is carried on the X chromosome, and so the disease caused by deficiency of the enzyme is inherited in a sex-linked recessive manner. Affected males are hemizygotes, whereas females can be carriers (heterozygotes) or affected (homozygotes) or normal. The disease is widespread, occurring in high frequency in peoples of the Mediterranean littoral, in Asians, and in Negroes. There are, however, differences between the Caucasian and Negro types of deficiency,[9] for a Negro deficient in the enzyme appears to be unaffected by the broad bean. Thus all persons with favism are found to have G6PD-deficient red cells, but not all (even of Caucasian extraction) who lack the enzyme are susceptible to the broad bean. This has led some workers to suggest that another inherited factor is required,[10] but there is no essential difference in the mechanism of lysis of G6PD-deficient red cells induced by primaquine and by fava extract.[11]

Haemolysis due to the ingestion of broad beans or drugs by persons with G6PD deficiency may be more common in Britain than is generally realized. Because of the relatively high frequency of deficiency in persons with Mediterranean, Asian, or African ancestors, it is among the immigrant population that it is most likely to be found, though favism has been reported in three persons of apparently pure British descent.[3,12,13] The diagnosis should be considered in every instance of unexplained haemolysis or anaemia, and is established by the use of one or more of the many laboratory methods for the detection of G6PD deficiency.[8] Most laboratories now include one of these methods in their routine investigation of haemolytic anaemia.

Treatment depends on correct diagnosis. Fortunately the haemolytic attack is usually of brief duration and self-limiting, as reticulocytes contain sufficient of the enzyme to resist haemolysis even in the continued presence of the toxic substance. All drugs and foods suspected of being potentially toxic should be withheld. Blood transfusion may be necessary if the anaemia is profound, and an exchange blood transfusion may be necessary in the most severe cases with anuria as a result of renal tubular obstruction by haemoglobin.

To prevent attacks persons deficient in G6PD must avoid all potentially harmful drugs and foods. There is a case to be made for the use of routine screening tests, such as the spot-test,[14] on all males of Mediterranean, Asian, or African extraction before treatment with sulphonamides, aspirin, phenacetin, and other drugs.

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