ORAL MANIFESTATIONS OF VITAMIN B_{12} DEFICIENCY

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IT has long been recognised that as many as 50 per cent. of patients suffering from vitamin B_{12} deficiency have glossitis—often the first manifestation of the disease (Witts, 1966). The tongue usually presents a fiery-red appearance, principally at the tip and lateral margins. Atrophy of the filiform papillae occurs and progresses unless vitamin B_{12} is given (Burkett, 1965). Other mucosal surfaces may appear atrophic, and erosions are not uncommon (McCarthy & Shklar, 1964).

The introduction of an assay of serum vitamin B_{12} by Hutner *et al.* (1956) has led to the discovery that the oral mucosa is sufficiently sensitive as an indicator of the serum vitamin B_{12} level to reveal changes before anaemia occurs (Adams, 1957).

MATERIAL AND METHODS

Between October 1965 and August 1966, a total of ten patients were seen in the Oral Medicine Department of the Eastman Dental Hospital complaining of a sore tongue or mouth, without an obvious local cause. One of these patients promptly went into spontaneous remission, another was found to have a definite megaloblastic anaemia, while the remaining eight were investigated for vitamin B_{12} deficiency by a serum assay.

The principle of the method of assay is to compare the growth-promoting effects on Euglena gracilis, var. bacillaris of varied dilutions of the serum with those of known concentrations of crystalline vitamin B_{12} (Hutner *et al.*, 1956). The normal range is generally accepted to be 150 to 1,000 $\mu\mu$g./ml.

RESULTS

Five of the patients under investigation for vitamin B_{12} deficiency were found to have abnormally low levels of the vitamin in their sera. The remaining three had normal levels and subsequently showed some improvement when treated with chlordiazepoxide 10 mg. t.d.s. The cases of vitamin B_{12} deficiency and that of the overt anaemia were, therefore, referred for further investigation and treatment. The case histories are briefly as follows.

Case 1. A male aged 60, referred by his dental practitioner for soreness of the tongue which had been present for six months. He gave a history of partial gastrectomy twelve years previously. The tongue was smooth and atrophic, and some atrophic changes were also apparent in the buccal mucosa. The Hb. estimation was 67 per cent. (9·8 gms./100 ml.); red blood cell count, 2,190,000/c.mm.; colour index, 1·52; white blood cell count,

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6,000/cmm. with a normal differential. The blood film showed marked anisocytosis, poikilocytosis and macrocytosis. He was referred to the Royal Free Hospital and parenteral vitamin B_{12} was given which cured the soreness and restored the papillation of the tongue.

Case 2. A male aged 65, sent by his medical practitioner with a complaint of a sore tongue and mouth. He gave a history of a partial gastrectomy fourteen years previously. Examination of the tongue revealed a loss of papillae and the appearance of his palate suggested chronic moniliasis. Candida were subsequently isolated and his symptoms partially improved after a course of nystatin tablets. Although there was nothing to suggest a megaloblastic anaemia from a blood examination—Hb. 83 per cent. (12·1 gms./100 ml.), with a normal film, and w.b.c. count of 7,000/cmm. with a normal differential—a serum vitamin B_{12} assay was performed which revealed a level of 35 $\mu\mu$g/ml. He was referred to the Royal Free Hospital and is now receiving monthly injections of 1,000 μg. vitamin B_{12}.

Case 3. A male aged 61, referred by his dental practitioner. He gave a history of a slightly sore tongue and tingling of the extremities, with a past history of a partial gastrectomy sixteen years previously and diabetes controlled by diet. On examination, the tongue and oral mucosa were normal; there was no obvious disturbance of the central nervous system. The Hb. was 98 per cent. (14·3 gms./100 ml.) with a normal film and a w.b.c. count of 7,500/cmm. with a normal differential. The serum vitamin B_{12} was 100 $\mu\mu$g/100 ml. He has been referred to the Middlesex Hospital where tests of vitamin B_{12} absorption are being carried out.

Case 4. A female aged 66, who had been attending the Hospital for two years with recurrent aphthous ulceration. When seen on one occasion for review, she complained of a sore tongue and dysphagia which had been present for three months. The dorsum of the tongue was found to be depapillated and smooth (see Fig. 1). The Hb. was 84 per cent. (12·2 gms./100 ml.) with a normal film. The serum iron was 105 μg/100 ml. and within the normal range. The w.b.c. count was 6,200/cmm. with a normal differential. The serum vitamin B_{12} was 50 $\mu\mu$g/ml. She was admitted to the Royal Free Hospital where she was found to have a histamine-fast achlorhydria, a megaloblastic bone marrow and a positive Schilling test. A diagnosis of pernicious anaemia was made, therefore, and she responded well to twice-weekly injections of 1,000 μg vitamin B_{12} and is now maintained on oral therapy.

Case 5. A female aged 38, sent by her dental practitioner. She complained of soreness of the tongue and buccal mucosa for a period of six months. The tongue and oral mucosa were normal. Hb. was 98 per cent. (14·3 gm./100 ml.) with no abnormalities in the film. The w.b.c. count was 10,600/cm. with a normal differential. The serum iron was slightly depressed at 75 μg/100 ml. (normal range 80-180) and the serum vitamin B_{12} was 100 μg/ml. She is also at present under investigation for a malabsorption defect.

DISCUSSION

Local causes are by far the commonest reason for soreness of the tongue in patients seen at the Oral Medicine Department of the Eastman Dental Hospital, and this is the experience of McCarthy and Shklar (1964) and Burkett (1965). Ill-fitting dentures, furthermore, appear to be the commonest aetiological factor in this case.

If local causes can be excluded, and there is no reason to suspect hypochromic anaemia or a malabsorption syndrome, then it is essential to investigate the patient

for a vitamin B_{12} deficiency and as can be seen from three of the cases in this series, a history of gastrectomy is especially important.

Adams (1957) described three cases of vitamin B_{12} deficiency presenting with a sore tongue in the pre-anaemic phase, but, as far as can be ascertained, this problem does not appear to have been the subject of further investigations. The

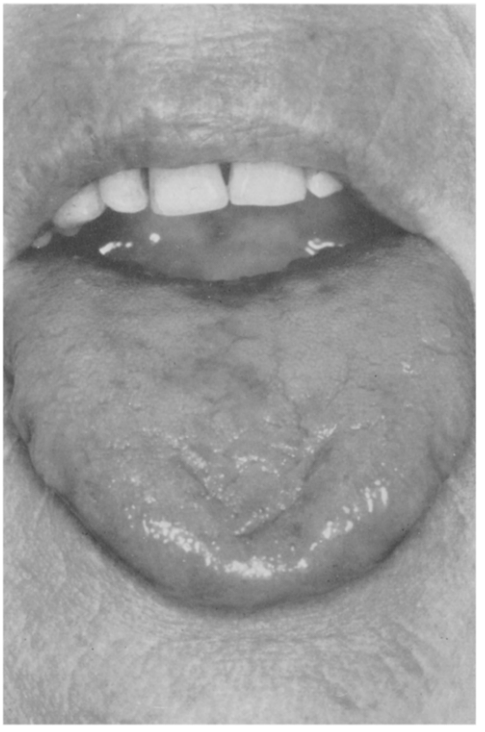

FIG. 1

Case IV. Depapillation of the tip, lateral surfaces and central dorsal area of the tongue.

importance of the early diagnosis of vitamin B_{12} deficiency has been emphasised recently by Riley (1966) who found that subacute degeneration of the cord can develop in the pre-anaemic phase, the serum vitamin B_{12} level, however, being low in these cases.

SUMMARY

Six cases of vitamin B_{12} deficiency presenting with a sore tongue are described. Only one of these had significant changes in the peripheral blood. The value of an assay of the serum vitamin B_{12} is discussed.

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