Sheehan and Summers (1949) mention that sarcoidosis has been reported as a cause of hypopituitarism, and they discuss the empty sella. They state that it is a peculiar type of scarring in which the sella appears quite empty, but histological examination of the floor shows that there is a dense layer of fibrous tissue enclosing a very thin lamina of anterior lobe parenchyma. Tissue was unfortunately not taken from the floor of the sella in this case, but a section from the pituitary stalk and hypothalamic region revealed no evidence of disease. This finding of a normal hypothalamic region is probably to be correlated with the absence of diabetes insipidus.

Of particular interest is the nature of the renal failure and glomerulitis, which was the terminal event. Longcope and Freiman (1952), in their study of sarcoidosis, mention that transient albuminuria and cylindruria are not infrequent accompaniments of active sarcoidosis. In their series of cases at the Massachusetts General Hospital were four cases showing a significant amount of impairment of renal function, but in none was it severe enough to lead to a fatal issue. Klinefelter and Salley (1946) reviewed four cases of renal failure in sarcoidosis, including one of their own, but this case was unsupported by necropsy evidence. Without doubt, renal failure is a very rare complication of sarcoidosis, and it is difficult to state what relationship the nephritis bore to the sarcoidosis. Possibly it was some sort of toxic or allergic reaction.

On the other hand, the renal failure may have been partly due to the suprarenal atrophy secondary to the hypopituitarism. Oelbaum (1952b) reviewed six cases of hypopituitarism due to post-partum necrosis, and remarked that there may be a marked dissociation in the degree of functional impairment of the thyroid, adrenal cortex, and gonads. It has been known for many years that renal failure and a high blood urea occur in suprarenal insufficiency. Lewis (1952) has suggested that the mechanism of this failure may be the low renal blood flow and filtration rate resulting from the reduced blood pressure, blood volume, and cardiac output. A remarkable feature of this case was the fall in blood pressure at the time of the last admission. In view of the glomerular changes, it is suggested that there was probably a combination of the two factors.

Summary

A case of hypopituitarism which appeared to be due to sarcoidosis is reported and a discussion of its relationship to renal failure given.

We wish to express our thanks to Dr. T. Robson for the clinical notes, and to Professor H. L. Sheehan for his advice on the sections.

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At a small reception held at the Royal College of Midwives on October 25, the President and Council of the College were officially presented with a colour film, "The British Midwife," by the chairman of the board of directors of Cow and Gate Ltd. The film outlines the training of the midwife and goes on to illustrate the work of a rural practising midwife and her management of a normal case in all its stages, including close-ups of the delivery. Even if the picture shown is that of the rosier side of a midwife's life—the country scene is gay with blossom and sunshine—and a short film cannot show everything, it leaves one in no doubt that the work of the British midwife calls for standards of professional competence and a sense of vocation of a high order. It should appeal to the best type of recruit to the profession.

SIX CASES OF INFANTILE SCURVY

BY

GWYN HOWELLS, M.D., M.R.C.P.

P. E. S. PALMER, M.B., B.S., D.M.R., D.M.R.T.

AND

W. H. St. JOHN-BROOKS, M.B., M.R.C.P.

(From the West Cornwall Clinical Area)

"To-day in its grosser manifestations (scurvy) may be said to have ceased to exist."—H. C. CAMERON (1941) in "Fifty Years of Progress in Paediatrics."

Scurvy is one of the classical diseases with a simple, straightforward aetiology, which is easily prevented and cured, and which should be easily diagnosed. The infantile form (Barlow's disease) differs from the adult form in its clinical features only because of differences in anatomy and physiology.

Scurvy has been recognized for centuries, and, though nowadays very rare in this country, persists at the two ends of life. The type occurring in elderly people who live alone and do their own cooking is often termed "bachelor scurvy." Series of this type are recorded by McMillan and Inglis (1944) and by Brown (1951).

It is remarkable that, with the varieties of organization and propaganda brought to bear on the mother, infantile scurvy exists at all. It is, however, difficult even approximately to determine its present incidence. The authors of most standard textbooks confine themselves to variations on the theme that it is "a very rare condition." Garrod *et al.* (1953) record that from 1933 to 1942 only 25 cases of infantile scurvy were admitted to the Hospital for Sick Children, Glasgow. Brailsford (1953) quotes one case seen in 1947. This apart, we can trace no recent specific reference. During the past five years only 10 cases have been seen at the Hospital for Sick Children, Great Ormond Street (figures quoted by permission of the Medical Committee).

Reports from America (Ellenbogen *et al.*, 1951; Silverman, 1953), Canada (Coward, 1950), Australia (Packer, 1947), France (Guerin, 1949), Italy (Camera, 1948), and India (Mukherjee, 1952) all confirm that the disease is now rarely seen.

When infantile scurvy occurs nowadays it is always in artificially fed babies whose feeds have been so treated by heat or commercial process as to destroy the vitamin C and who have had no supplementary feeding with fruit or vegetable juices. The practice of warming orange juice occurs quite commonly in this country. Rarely, but not recently, scurvy has been reported in breast-fed babies when the mother also has a very deficient diet.

Case 1

A girl aged 1 year was admitted to hospital with a complaint of painful paralysed legs. The illness had begun four days earlier with cough, sore mouth, pyrexia, and apparent pain with inability to move the legs. Signs of bronchopneumonia had developed the following day, but, although the chest had improved with sulphamerazine, the other symptoms had grown worse. On admission to hospital, undiagnosed, the child was very pale, but was well developed and nourished. Temperature was 101° F. (38.3° C.) and pulse 140. There were no skin rashes or petechiae. Four incisor teeth were through, and around them the gums were red and swollen. Both legs were oedematous up to the

groins and were extremely tender to touch and on movement. Blood count: Hb, 38% ; R.B.C., 4,120,000 ; W.B.C., 10,400.

The baby had been fed entirely on National dried milk since birth. No additions had been made to the diet, as the baby "wouldn't take them." There were two older children, both healthy.

Scurvy was diagnosed, and treatment was begun with ascorbic acid. Appetite was so lacking that the child would take nothing by mouth, so 200 mg. of ascorbic acid was given intramuscularly, and subsequently 50 mg. t.d.s. orally. The gum-swelling disappeared within the first six days, while the limbs became painless, though some oedema remained for a fortnight. After a month the Hb was 75% and the R.B.C. 5,200,000. The child was easily weaned to a mixed diet.

Case 2

A twin girl aged 7 months was referred to the surgical out-patient department because of proptosis of the left eye. Four weeks previously she had fallen from her pram, but no injury was then noted. A week later the eye was noticed to be protruding, but this had improved until four days before admission, when the swelling had rapidly increased. For the same period the child had been off her food and disliked her legs being moved.

On examination the left eye was proptosed. There were bruising of the upper lid, a small conjunctival haemorrhage, and slight pain on movement of the legs, though this was regarded as a positive Kernig sign. There was no pallor, rash, gum-swelling, or abnormal signs in other systems. The child was admitted with a provisional diagnosis of retrobulbar haematoma and meningeal irritation. She was seen by an ophthalmologist, who suggested that the proptosis might be secondary to a neoplasm, with scurvy as an alternative diagnosis. The diagnosis was not made firmly until the twin was admitted a short time later.

Case 3

The twin, a male, was admitted with swelling and tenderness of the knees of ten days' duration. For five days the child had been off his food and the gums had become swollen and blue. These features were confirmed on examination, though otherwise the baby looked healthy. The male child had a haemoglobin of 80% and the female of 96%.

Scurvy was diagnosed in both twins and was confirmed radiologically. Their diet had consisted of boiled cow's milk since birth. The mother stated that they would take no other food or supplement, but in the ward both accepted a mixed diet suitable for their age. There were two healthy older children.

The girl had already improved on ordinary ward feeding, which included orange juice and vegetable extracts, but no added vitamins. Both were given 100 mg. of ascorbic acid, and the male improved rapidly to equal the condition of his twin. His recovery was interrupted, however, by a pneumonic episode, which responded to penicillin. After their discharge the district nurse reported that they remained healthy and were taking a mixed diet.

Case 4

A boy of 8 months was admitted as a case of multiple arthritis. He had had a dry cough since cutting his first tooth two months previously. The legs had become painful three weeks before admission and gradually swollen and more tender. A week later he had had small epistaxes and developed red spots on the back and legs. For one week the urine had been dark. The baby had been fed since birth on boiled cow's milk, with sugar and a patent barley preparation as the only additions. Two brothers, aged 4 and 6, were healthy, but a sister, aged 2, had had a similar complaint at the same age and, though making a spontaneous recovery, was said still to have a limp because of a stiff knee.

On examination the child was apparently well nourished and of good colour. There were purple swellings of the upper gum round the central incisors. The skin of the legs and back showed a few small petechiae. The legs were flexed; movement was resented, and there was tender swelling of both legs up to the groins. The chest showed signs of a moderate bronchitis. Blood count: Hb, 57% ; R.B.C., 3,890,000 ; W.B.C., 7,800.

The child was treated with ascorbic acid 100 mg. t.d.s. orally. Progress was rapid and he was discharged after a fortnight. The gums were then normal; cough, petechiae, and swelling of the legs had gone, and there was free movement of the limbs, though still slight tenderness on deep pressure.

Case 5

A girl of 7½ months was brought to her doctor by the mother, who complained that the baby would take only the first and last feeds of the day. The mother, who was of poor intelligence, had noticed nothing else abnormal. Questioning revealed that the first and last feeds were given with the child lying in her pram, and that for the feeds which she refused she was always picked up. The child had been fed on diluted milk and was said to have refused orange juice. Little reliance could be placed on the history.

On examination the child appeared well nourished but was irritable and somewhat pale. Handling the limbs was resented, but no other definite physical signs were found. There were no petechiae.

Scurvy was diagnosed, and confirmed radiologically. For three days 200 mg. of ascorbic acid was given daily intramuscularly, and thereafter 100 mg. daily by mouth. Response was dramatic, and within 10 days the child had returned to normal.

Case 6

A girl of 11 months was admitted with the diagnosis of a respiratory infection. For a week she had seemed "off colour" and irritable, and was becoming gradually worse. The diet had been National dried milk since birth, but the mother insisted that she had given orange juice and cod-liver oil regularly. There were four healthy older children.

Examination showed an ill child, well developed but rather pale and flabby. The temperature was 99.6° F. (37.55° C), and the pulse 120; the baby was dyspnoeic and irritable. There was facial oedema, particularly of the lower lids. She resented handling and her legs appeared tender. The mouth was dry and sore, but there was no swelling of the gums. There were scattered crepitations throughout both lungs.

A provisional diagnosis of bronchopneumonia was made, and, because of the facial oedema, nephritis was also considered. A radiograph taken for the chest showed bony changes of scurvy in the shoulder-joints, and further films showed advanced radiological changes elsewhere. Clinical response to ascorbic acid was dramatic, but radiological improvement was of course less rapid, and, two years later, there are still residual x-ray changes, though the child appears extremely healthy.

Diagnosis

The diagnosis should not, in theory, present much difficulty, and yet in this series only one case was diagnosed on first examination. Of the five cases sent into hospital none was even suspected before admission. One was not diagnosed until the twin arrived in hospital, and Case 6 was revealed by a radiograph taken nominally for the chest. The reason for this difficulty seems to be that, although the symptoms of scurvy are well known, the diagnosis is not considered because, as personal inquiry has shown us, there is a widespread opinion that infantile scurvy no longer exists. This impression has probably been contributed to by the absence of any case reports in the British literature for many years.

The diagnosis should usually be made on the occurrence of irritability and limb tenderness in an infant between 6

and 12 months old with the typical feeding history. Additional evidence may be found in the presence of gum-swelling or haematuria, though the latter is more commonly found on microscopical examination than as an early and constant symptom. We submit, in agreement with Mukherjee (1952), that when the diagnosis is made or suspected on clinical grounds it may best be confirmed by radiographs, and that radiology is of far more assistance, as well as quicker, easier, and kinder, than any biochemical or clinical test so far devised. Radiological confirmation has also the advantage that a therapeutic test need not be delayed, as, although symptoms are relieved, ascorbic acid will not affect the x-ray appearances for many days.

The typical radiological changes leave no doubt about the diagnosis, though the extreme variation in the distribution and severity of the lesions may make it necessary to take films of all the joints. The changes have been summarized by numerous authors (Shanks and Kerley, 1950; Mukherjee, 1952), but one finding we have not seen recorded previously: in Case 6 there were a few small scattered islands of dense bone in the left ischium, which disappeared completely in one month. Examination was thorough, but there were no similar changes elsewhere. This was, radiologically, an advanced case with many severely displaced epiphyses, and, though the child is completely well, cystic changes in the epiphyses of the knees still remain two years later.

We disagree with Kato (1932), who states that subperiosteal haemorrhages are the only radiological pathognomonic sign of scurvy, and with Brailsford (1953), who states that they are the earliest radiographic lesions. In our experience subperiosteal haemorrhages do not become calcified and clearly visible until healing begins, though then this feature may be very marked. In only one of our cases, radiologically the most severe, could early periosteal lifting be seen when the patient was first examined.

Discussion

The features of these six cases correspond to the accepted picture of infantile scurvy. The age incidence of 7–12 months is within that expected (6–12 months), and the first five cases had typical feeding histories. All six had four features in common: limb tenderness, good general nourishment and development, radiological changes, and a speedy response to vitamin C. The limb tenderness was constant, but varied from acute pseudoparalysis to simple dislike of handling. Pallor is said by Sheldon (1946) to be a common sign, and was observed in three cases, but it is probably better regarded as a measure of anaemia than as a specific feature of scurvy. Blood counts in four cases showed variations from a moderately severe anaemia to a normal blood picture. Gum-swelling was an inconstant finding, seen in three cases only. The proptosis with which Case 2 began is a well-recognized if unusual mode of onset of scurvy, as also is the acuteness with which the illness of Case 4 commenced. An unusual feature was the occurrence of moderate-to-severe chest infections in four cases at some stage. The petechiae (except in Case 4) and the follicular hyperkeratosis of the adult disease were not seen.

All the babies were bottle-fed and five of the mothers admitted giving no supplementary orange juice. Whether the statement of the mother of Case 6, that the baby had received regular orange juice, was true, can only be a matter for conjecture. To claim this as a case of scurvy developing in spite of regular orange juice would need stronger evidence. In three cases the mother stated that the baby would not take mixed feeding; in two there was alleged to be an intolerance of orange juice, but in no instance was this confirmed.

For the prevention of scurvy it is well known and widely publicized that all artificially fed babies need extra vitamin C, and the orange juice supplement supplied through welfare clinics is clearly adequate. The difficulty lies in providing for the occasional apathetic or ignorant mother.

For practical purposes the disease does not occur in breast-fed babies. Indeed, the appearance of infantile scurvy, unknown before 1850, followed the adoption of artificial-feeding methods, at a time when adult scurvy was vanishing. Among many other advantages, natural feeding, still too often abandoned on inadequate grounds, remains the simplest and surest preventive measure. Alternative feeding methods in which supplements are essential to prevent deficiency diseases are well described as "artificial."

Ascorbic acid is the most effective method of treating the established case, and response serves as a valuable confirmation of the diagnosis.

Conclusion

These six cases were all seen in West Cornwall (population approximately 250,000) in the three years 1950–2, and at least one valid conclusion can be drawn—namely, that, although infantile scurvy should not exist nowadays, it quite definitely does. If this is not realized, cases that do occur are far less likely to be diagnosed at an early stage. We feel that the attitude implicit in the quotation which heads this article is not only untrue, even as a generalization, but it is also a highly dangerous one to adopt. The diagnosis of the occasional case of scurvy is far more important because of its curability than the exact diagnosis of many a less amenable disease. The elder sister of Case 4 probably illustrates this.

[Since the preparation of this paper a further typical case in an artificially fed infant aged 10 months has been described by Dr. Eric Townsend, of Camborne, at a meeting of the Cornwall Clinical Society.]

Summary

Six recent cases of infantile scurvy are recorded.

Limb tenderness was the most constant positive feature; all the patients were well nourished and had been artificially fed; all responded to ascorbic acid therapy.

The place of radiology in the diagnosis is emphasized.

The occurrence of these cases provides an important reminder that infantile scurvy—an easily diagnosed and treated disease—still exists, despite modern welfare facilities.

We should like to thank our colleagues in the West Cornwall Clinical area, both in consultant and in general practice, for their very willing co-operation. We are grateful also to the staff of the Library of the British Medical Association for much help with the literature.

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The Rockefeller Institute for Medical Research has announced the publication in January next of the *Journal of Biophysical and Biochemical Cytology*, which will publish papers on the morphological, biochemical, and biophysical aspects of the structure of cells and their components, and on the functions of these components. The journal will give special attention to investigations dealing with the cellular organization at colloidal and molecular levels. It will appear six times a year at an annual subscription of \$7.50.