anaemia when in combination with S. Its incidence in American negroes is not known, but it must be much rarer than C. Apart from the studies of Edington and Lehmann on haemoglobin C in persons from the Gold Coast, haemoglobins C and D have so far been described only as occurring in American negroes. The combination of the single gene for sickling and the single gene for thalassaemia can also produce a haemolytic anaemia (Powell *et al.*, 1950). Thus, of all the cases of a haemolytic anaemia with sickling that are seen in America, most are true sickle-cell anaemia, but a proportion are due to the combination of the sickling gene with some other inherited abnormality of haemoglobin synthesis.

Thalassaemia, which is readily recognizable, is not known to occur in the Africans of tropical Africa, and hence it is unlikely that there are in Uganda any cases of anaemia due to the combination of the sickle-cell gene and the thalassaemia gene. It, however, appeared possible that some of the cases of apparent sickle-cell anaemia were due to the coexistence of haemoglobin S with C or D. In order to determine this, it seemed easiest to examine only non-sickling bloods—in other words, to screen the population for possible haemoglobins C and D in combination with A rather than S and to preserve any of these bloods showing a double haemoglobin for identification elsewhere.

Method

Bloods sent in to the laboratory for routine Khan tests were used. A sickling test was done, using a 24-hour *Bact. coli* culture and reading the unsealed preparation in two hours. All sicklers were discarded except one out of each batch, which was used as a control. As much serum as possible was drawn from the clot and discarded, and, after shaking, a drop of concentrated red cell suspension was withdrawn. To this was added a drop of 0.5% saponin in watery solution to cause lysis. Paper strip electrophoresis was performed in the Shandon apparatus with the apex height adjusted to 4½ in. (11.4 cm.) instead of the standard 7½ in. (19 cm.). A barbituric acid/sodium barbitone buffer of pH 8.6 and ionic strength 0.06 was used, and, with eight strips of Whatman No. 3, each 1½ in. (3.8 cm.) wide, electrophoresis was allowed to proceed at a voltage of 90–110, giving a current of 1.5–2 mA, for 12 to 18 hours. A sickling control was included in each run. The position of the haemoglobin could readily be seen without further staining provided the solutions were concentrated enough. If there was any doubt a washed and cleared preparation was made from the original clot and the procedure repeated.

Results

Of 500 bloods examined, 250 were male and 250 female. They were almost entirely adults. The tribal composition is not accurately known but is largely Bantu, of which the majority are Baganda. There were probably some 40 to 50 Nilotics. No case was found with a double haemoglobin, and all the haemoglobins migrated with the same speed as normal adult haemoglobin.

Conclusion

In a series of 500 non-sickling bloods examined in Kampala no example of haemoglobins C or D has been found. Since, on the other hand, there is known to be a considerable amount of haemoglobin C in West Africa, it is probable that this area is the source of the genes for haemoglobin C found in American negroes. This is, in any case, the most likely source, since the slaves largely came from this area. Most, if not all, of the haemolytic anaemias in Uganda, in which sickling appears to play a part, may therefore prove to be true cases of homozygosity for the sickling gene. There remains, however, the possibility that other modifying haemoglobins exist here which could be distinguished by properties other than electrophoretic mobility at alkaline pH.

I am indebted to the Director of Medical Services, Uganda, for permission to publish.

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Medical Memoranda

Death from Hexamethonium Ileus

In view of the increasing use of ganglion-blocking drugs in the treatment of patients with severe hypertension, this report of an avoidable death caused by one of these drugs may be of interest.

CASE RECORD

A carpenter, aged 54, was admitted to another hospital in April, 1953, in congestive cardiac failure, due to hypertension. He was discharged, improved by orthodox treatment, after three weeks.

In August, 1953, he was admitted to this hospital in a further attack of congestive cardiac failure with a blood pressure of 250/180 mm. Hg. He had now developed bilateral papilloedema with retinal haemorrhages and exudates. In view of the severe retinopathy it was decided to begin treatment with hexamethonium bromide in addition to full doses of digitalis and mersalyl.

On discharge, five weeks later, he was giving himself 280 mg. of hexamethonium subcutaneously three times daily. His blood pressure was fluctuating between 180/110 and 140/95 mm. Hg, whilst the papilloedema was beginning to regress.

At follow-up his dose was reduced to 200 mg. thrice daily, and he was advised to take 7½ mg. of neostigmine orally for his alimentary dysfunction. He took this dose for three days, when both eructation and diarrhoea ceased. However, on the fourth day he became obstructed and began to vomit, and on the fifth day he developed colicky abdominal pain. He continued to inject full doses of hexamethonium in spite of having been told to reduce the dosage if the diarrhoea or constipation should become severe. Only on the sixth day did he permit his wife to arrange for urgent readmission to hospital. He was found to be very dehydrated, with a thready, regular pulse and a blood pressure of 110/90 mm. Hg. The abdomen was greatly distended, particularly over the upper quadrants. There was some lower abdominal tenderness and guarding, and almost complete absence of bowel sounds. A radiograph of the abdomen showed gaseous distension of the small gut with fluid levels. Small amounts of gas and faeces were present as far as the hepatic flexure.

Ileus due to hexamethonium was provisionally diagnosed, and treatment was started with gastric suction and intravenous glucose-saline. A total of four pints of black fluid was aspirated from the stomach within the next four hours, during which time the patient's condition improved greatly. Further improvement seemed to justify continuation of conservative treatment, but 16 hours after admission the pulse rate rose to 120 a minute over the space of an hour, and his condition gravely deteriorated. Immediate operation was decided upon, as it was now thought likely that a perforation had taken place. The patient died before he could be got to the theatre.

Post-mortem examination within 3½ hours of death showed that operative intervention would have been valueless. The stomach and 5 to 6 ft. (1.5 to 1.8 metres) of small intestine were dilated and filled with foul faecal fluid. No perforation was found, but throughout the small intestine there were areas showing thinning of the bowel wall.

with fibrinous reaction on the serosal surface. These areas ruptured on the slightest handling. The other findings were those expected in a case of malignant hypertension.

COMMENT

Bowel disturbances ranging from constipation with or without diarrhoea to complete ileus are not uncommon during the early stages of effective treatment with ganglion-blocking drugs. Most patients on treatment report occasional bouts of constipation, often accompanied by diarrhoea, though these attacks tend to become less frequent as time passes. During these episodes the urinary output falls. As hexamethonium compounds are not destroyed to any extent in the body, but are almost wholly excreted in the urine (Zaimis, 1950), oliguria leads to the building up of a dangerous concentration of the drug in the body, unless the dosage is cut down. This in turn can lead to further bowel atony, progressing to ileus, unless the situation is recognized and all drug treatment is withheld. This state of affairs may not be very obvious from clinical examination, as blood concentrations of the drug beyond a certain point do not necessarily produce a progressive fall of blood pressure. The ileus thus produced can lead to loss of bowel viability with consequent peritonitis.

In the ganglion-blocking drugs we have a powerful weapon which is life-saving in suitable cases. Their use does, however, require close and careful supervision. The patient should be warned to cut down or omit his injections when constipation becomes too obstinate, or when fever, vomiting, sweating, or diarrhoea threatens his urinary output. He should always consult his doctor when in doubt or in difficulties.

My thanks are due to Mr. P. F. Jones for sharing in the management of this case, and to Dr. R. A. J. Asher for permission to publish.

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Carbuncle of the Kidney

Perinephric abscess is not uncommon as a complication of a transient bacteraemia, but a carbuncle of the kidney occurs only infrequently. Brady was able to review only 88 recorded cases up to 1932, and the condition is apt to be overlooked in considering the differential diagnosis of a possible perinephric abscess. For this reason the following case, in which the diagnosis was made with some certainty before operation, is presented in detail.

CASE HISTORY

A man aged 28 attended the out-patient department complaining of pain in the right loin and of anorexia, both of seven days' duration. The pain was continuous, of gradual onset, did not radiate, and was felt posteriorly below the last rib. There was no nausea or vomiting, micturition was entirely normal, and there were no symptoms referable to the other systems. He could remember no pustule or other possible septic focus in the previous two months.

The temperature was 100.2° F. (37.9° C.) and the pulse rate 86. In the right loin a smooth tender swelling was palpated bimanually, which moved slightly with respiration and appeared to be the lower pole of the kidney. There was no muscular rigidity, and no other abnormal physical signs were elicited. The urine was normal to chemical and microscopical examination. The patient was admitted and penicillin therapy was begun.

Investigations.—Urine: culture sterile after 24 hours. Blood: Hb, 75%; R.B.C., 4,000,000; W.B.C., 18,500 (polymorphs, 85%); urea, 34 mg. per 100 ml. X-ray report: "The outline of the upper two-thirds of the right kidney is normal, but the lower pole cannot be identified. The edge of the right psoas shadow is not seen. Slight lumbar scoliosis to the left. Normal left kidney and psoas shadows."

Intravenous pyelogram: normal appearance of calices and pelvis on both sides. Cystoscopy: bladder normal in all respects. Retrograde pyelogram normal.

On these findings a confident diagnosis of carbuncle of the lower pole of the right kidney was made.

Operation.—The right kidney was exposed by the lumbar route on the second day after admission. There was oedema of the perinephric tissues, but no evidence of suppuration. The lower pole of the kidney was enlarged and fluctuant, but the surface appeared normal. A needle was inserted and thick yellow pus aspirated. The abscess was opened along the needle track, a finger swept round to break down any septa, and a drainage tube inserted around which the wound was closed. Some 5 fl. oz. (140 ml.) of pus was evacuated.

Culture of the pus secured at operation yielded a growth of *Staph. aureus* sensitive to penicillin. The temperature fell by lysis and was normal on the third post-operative day. Penicillin was discontinued the following day. The drainage tube was shortened on the 10th day and removed on the 13th. When the patient was discharged on the 20th day the wound was soundly healed and an intravenous pyelogram report stated: "Normal pelvis and calices, but the lower pole of the right kidney appears larger than normal. The psoas shadow is seen on both sides."

The patient has been seen at the follow-up clinic and has remained well.

COMMENT

The diagnosis of renal carbuncle is of importance in that, whereas observation of a perinephric abscess does relatively little harm, delay in treating a carbuncle damages more of an irreplaceable tissue at a time when the other kidney may also be infected. The demand for surgery is therefore urgent for two reasons—to drain the abscess in order to limit destruction of the kidney tissue and to secure pus for sensitivity tests.

The clinical features are admirably portrayed by this case, but whether the kidney is palpable depends first on the normal position of the kidney in the individual patient, and, secondly, on the site and size of the carbuncle. The degree of perinephritis determines movement on respiration. The findings in this case suggest that fixity occurs late, as this quite large carbuncle was still mobile on the ninth day of symptoms.

One would expect the outline of the enlarged kidney to show on an x-ray film of the abdomen, and Thomson-Walker (1948) gives this as a radiological sign of carbuncle, but in the above case it remained undefined until after operation, and clearly it and the psoas shadow were obscured by the perirenal oedema. A pyelogram may show the nearest calix to be deformed by the mass.

Fleming (1950) recommends treatment with penicillin only, but he stipulates that it must be continued for from three to four weeks and that a normal temperature and feeling of well-being are insufficient indications to stop treatment. He suggests that the drug may be stopped when the pyelogram returns to normal, but in the above case it was never abnormal. Even in this chemotherapeutic age the old adage, "Where there is pus, let it out," remains as true as when it was coined, for thereby toxæmia is relieved and resolution accelerated. Excessive fibrosis is known to occur as a result of delayed drainage of a pyogenic abscess treated with antibiotics (Stammers, 1953), and I have seen several breasts destroyed and a "frozen" hand from this cause. Antibiotics aid but do not replace the surgeon. If a carbuncle is suspected the kidney should be explored without undue delay, any abscess drained, and the pus submitted for sensitivity tests to indicate the most suitable antibiotic should one be required. Only rarely should nephrectomy, freely advocated in earlier writings, be necessary.

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