resident in Panama, and the 5.2% for Panamanians. The number of Caucasians coming to necropsy at University College Hospital, Jamaica, was small, but, of the 18 cases so described and sufficiently documented, only one had hypertensive disease. These comparisons are of interest, but no conclusion regarding the incidence of hypertension in the general population can be drawn from them. The findings show, however, that the ratio of renal (38%) to essential hypertension (62%) is high, since it is generally accepted that in 90% of hypertensives there is no kidney disease to explain the elevation of blood-pressure. Though the presence of renal disease in some cases of hypertension may be coincidental and in others the severity of the renal disease may have been misjudged and the cases wrongly designated renal hypertension, it is unlikely that these factors would alter the ratio to any great extent.

The commonest renal lesion was pyelonephritis, and in the smaller series of 250 cases previously mentioned 40 (16%) had pyelonephritis. This approaches Taylor's figure of 19.6% for West Indian immigrants into Panama, and is to be compared with the 8.2% he quotes for Caucasians resident in Panama. The reasons for this apparently high incidence of pyelonephritis are not known. The reasons for this apparently high incidence of pyelonephritis are not known. A number of factors, including urinary obstruction, diabetes mellitus, and venereal disease, may be concerned. Of the 40 cases of pyelonephritis 11 were associated with obstruction and 7 with diabetes mellitus. The incidence of venereal disease in the present series is not known, but it is probably higher than would be encountered in present-day European material.

In the same series of 250 cases there were no fewer than 11 cases of diffuse glomerulonephritis (4.4%). This suggests that climate plays no important part in the aetiology of the condition, and that infections with the group A beta-haemolytic streptococcus may be common here.

Raaschou (1949) showed that a normal or near-normal liver function was needed if hypertension was to be maintained. Loyke (1955) demonstrated that hypertension did not usually occur in the presence of cirrhosis provided the kidneys were normal, and also that established hypertension was reversed to normal pressure with the onset of cirrhosis. In my material 2 out of 26 cases of cirrhosis had normal blood-pressure readings but gave a history of hypertension or had anatomical evidence of hypertension.

Summary

Evidence of hypertension was found in 31% of adult Jamaicans coming to necropsy, but no conclusion regarding the incidence of hypertension in the general population can be drawn from this finding.

The ratio of presumed renal (38%) to essential hypertension (62%) was high. Pyelonephritis was the commonest lesion.

Hypertension was concerned in the death of 20% of Jamaicans coming to necropsy.

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TWO CASES OF LOCKED TWINS

BY

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This very rare condition is believed to occur once in every 90,000 deliveries or once in every 1,000 twin deliveries. It is thus felt justifiable to report these two cases.

Case 1

An unbooked primigravida aged 26 was admitted on October 22, 1958, to the Obstetric department at Queen's Park Hospital, Blackburn, as a case of twin pregnancy with ruptured membranes. There were no contractions. The pregnancy had advanced to just over 36 weeks.

The antenatal history showed that an external cephalic version had been performed at the 31st week. The breech presentation recurred, and version was repeated two weeks later. Twin pregnancy had then been suspected, and an x-ray examination confirmed the presence of twins. The leading foetus was reported to be presenting by the breech with its spine to the left, yet it was difficult to decide whether the legs were flexed or extended. The second twin was presenting by the vertex, and its spine was to the right.

The membranes had ruptured 11 hours before admission, but the patient stated that the amount of liquor that had drained was not excessive. She felt no uterine contractions. The uterus was enlarged to the level of the ensiform cartilage. The pregnancy seemed to have been progressing satisfactorily. The blood-pressure was 125/80. The haemoglobin was 73% (10.9 g./100 ml.). Urine examination was negative. Two foetal hearts were heard—one in the right iliac fossa and the other to the left of the umbilicus. A vaginal examination showed the cervix to be closed, and a vertex was thought to be presenting at the brim (this was probably the vertex of the second twin).

Complete bed rest, prophylactic penicillin, and oral iron therapy were prescribed.

Four days later labour began, but the contractions were rather irregular and infrequent. Next day the cervix was found to be three-quarters dilated and a flexed breech was presenting at the level of the brim. The contractions had ceased for approximately four hours. A "pitocin" drip containing 10 units per litre was started intravenously. The contractions became more frequent, but were short in duration. At 8.30 p.m. the cervix was found to be fully dilated on vaginal examination and the breech had reached the mid-cavity in the left sacro-transverse position. Two hours later the breech was just showing at the vulva and the contractions were quite strong. An anaesthetist was present, as it was customary to give the patient a light anaesthetic for the delivery of the aftercoming head. For another hour no advance was noticed, and it was decided to assist delivery.

An episiotomy was performed after infiltration of the perineum with 1% lignocaine. The legs were brought down and with gentle traction the baby was delivered to just above the umbilicus. The patient was then very apprehensive and uncooperative, and it was decided to proceed with the general anaesthetic at once and extract the baby. This was begun (thiopentone, nitrous oxide, oxygen, and ether), and further traction could achieve delivery to the middle of the scapulae but no further, in spite of bringing down the arms. Further vaginal examination revealed the head of the second twin to be engaged in the pelvis. It was then realized that the head felt above the symphysis pubis was that of the first twin. The head of

the second twin was then pushed up, this being assisted by pushing upwards and inwards on the axillae of the first twin. Unlocking was achieved after a little difficulty. The anaesthesia was, however, fairly deep. The first twin was then delivered easily, the head being delivered by the Mauriceau-Smellie-Veit manoeuvre. It had rather a long neck and was deeply shocked.

Five minutes later the second amniotic sac ruptured spontaneously and the head engaged in the pelvis in the right occipito-posterior position. It was rotated and delivered by forceps 15 minutes after delivery of the first twin. Ergometrine, 0.5 mg., was given intravenously.

The placenta was binovular, being formed of two partially fused placentae. It weighed 2 lb. (907 g.). The episiotomy was repaired. The puerperium was uneventful.

The first twin was a female weighing 3 lb. 4 oz. (1,475 g.). Its crown-heel length was 16 in. (40.6 cm.) and its head circumference measured 10½ in. (26.7 cm.). It quickly recovered and gained weight steadily. Apart from an attack of staphylococcal enteritis on the sixth day its progress was normal. She was quite well, and weighed 10 lb. 10 oz. (4,820 g.) when 5 months old.

The second twin was a male weighing 4 lb. 14 oz. (2,210 g.). Its length was 18 in. (45.7 cm.) and its head circumference measured 12½ in. (31 cm.). It made good progress, and when seen five months later weighed 13 lb. 11 oz. (6,210 g.).

Case 2

A primigravida aged 22 was admitted on April 20, 1959, to the obstetric department of the City Hospital, Derby. She was transferred from a near-by maternity home on account of premature rupture of membranes. The pregnancy had reached the 32nd week, and had apparently been quite uneventful.

The membranes ruptured eight hours before admission, but she had had no contractions. She was thinly built. The fundus uteri was two fingerbreadths below the ensiform cartilage. The uterus was rather tense, but two foetal heads could be palpated—one in the left hypochondrium and the other in the right iliac fossa. A provisional diagnosis of twin pregnancy was made. Her blood-pressure was 130/80 and examination of the urine was negative. Her haemoglobin was 75% Haldane (11.1 g./100 ml.). Bed rest was prescribed.

A vaginal examination disclosed a long cervix which admitted one finger. The presenting part was at the level of the brim and was thought to be a breech. X-ray examination confirmed the presence of twins. The leading foetus was presenting by the breech with its back to the left. The second twin presented by the vertex and its back was to the right.

For the next nine days liquor amnii continued to drain per vaginam. On April 29 labour started. The contractions were strong and frequent, and after two and a half hours vaginal examination revealed the cervix to be fully dilated. A complete breech occupied the lower pelvic strait and preparations were made for delivery.

A pudendal-block anaesthesia, using 1% lignocaine, was carried out followed by an episiotomy. The baby was then delivered spontaneously to the level of the inferior angles of the scapulae. The arms were easily brought down, but further delivery was impossible. The left hand was then introduced in the vagina and the head of the second twin was found engaged in the pelvis.

General anaesthesia was then quickly induced with nitrous oxide, oxygen, and ether, but disengagement could not be achieved until a deep level of anaesthesia had been reached. Pressure upwards on the head of the second twin and on the trunk of the first resulted in disengagement. The first twin was then extracted quite easily, using the Mauriceau-Smellie-Veit technique for the after-coming head, but was

stillborn. Its heart-beat was noticed to have ceased a few minutes before completion of delivery. The time interval from the birth of the umbilicus to the completion of the delivery of the head was 17 minutes.

The second twin then engaged in the left occipito-posterior position. The membranes were ruptured artificially. Neville-Barnes forceps were applied after an unsuccessful attempt at manual rotation and the baby was delivered face to pubis, 10 minutes after delivery of the first twin. It cried immediately.

Two separate placentae were delivered, weighing 12 oz. (340 g.) and 10 oz. (283 g.) respectively.

The first twin was a female and weighed 4 lb. 3 oz. (1,900 g.). It measured (crown-heel) 18 in. (45.7 cm.). Its head circumference was 12½ in. (31 cm.).

The second twin was also a female and weighed 4 lb. 2 oz. (1,870 g.). It measured 17½ in. (43.8 cm.). It had an equal head circumference. It made good progress, and when seen at 11 weeks of age it weighed 8 lb. 14 oz. (4,025 g.) and was quite well.

Incidence

Jahkola (quoted by Falke, 1939) collected 83 cases of locked twins from the literature up to 1936. Lawrence (1949) collected 28 cases published from 1907 until 1946 and reported three cases. Nissen (1958) reviewed the literature from 1882 until April, 1957, and collected 69 cases, including one of his own. In an addendum he also referred to one case described by Colliton. I accidentally came across a case not included in Nissen's collection. This was published by McKenzie and Quist (1956), who described a chin-to-chin locking diagnosed radiologically and delivered by caesarean section. From April, 1957, up to the articles indexed in the May, 1959, issue of the Current List of Medical Literature only three published cases could be found. Kreis and Miller (1958) described a case of chin-to-chin locking. An attempt at disengagement failed, as did a trial of the Kimball and Rand (1950) technique of delivering the head of the second twin with Piper forceps past the first twin. Ultimately decapitation of the first twin had to be performed before delivering the second twin alive. The first twin weighed 3 lb. 15 oz. (1,786 g.) and the second 4 lb. 11 oz. (2,126 g.). Percival (1959) described two unpublished cases of Sir Eardley Holland's. In both cases the presentation was cephalic in either twin. One case was delivered vaginally after disengagement and the other by caesarean section.

von Braun (quoted by Brews, 1948) observed only one case of twin locking in 90,000 deliveries in Vienna, and this estimated incidence of the condition is quoted by most writers. Horder (1944) and Stenström (1951) believe the incidence to be higher than von Braun's estimation. It must be difficult to estimate the real incidence of locking, as not all cases are published. I know of one such case.

Discussion

Lawrence (1949) classified cases of locking into four groups according to the respective presentation of the twins. These are, in order of frequency, breech and vertex, vertex and vertex, vertex and transverse, and breech and breech. Nissen (1958) followed Lawrence's classification. In his collection a little more than two-thirds belonged to the first group.

The two reported cases also belonged to the first group, and locking occurred between chin and chin.

Both cases occurred in primigravidae; 72% of Nissen's collection were in primigravidae. This is believed to be aetiologically significant.

In both cases premature rupture of the membranes of the leading foetus occurred. It was not, however, noticed that the second amniotic sac contained an unusually small amount of liquor; a fact which many commentators think predisposes to the occurrence of locking. It is, however, reasonable to assume that a reduction of the amniotic fluid in either sac may favour locking of the twins as a result of closer approximation.

A third factor which is considered significant in the aetiology is a large-sized pelvis in relation to the sizes of the babies. In the two cases reported the babies were small, but the mothers were not of unduly big stature. In fact, the height of the mother in Case 2 was 5 ft. 1 in. (155 cm). I could not find a record of the height in the first case, but her pelvis was not of exceptionally large dimensions clinically.

Another factor thought to be contributory is hypertonicity of the uterus. This was so in the second case but not in the first. In fact, in the latter, the uterine tone was very low and she was completely inert at some stages of labour.

Stenström (1951) found a higher incidence in uniovular twins. The two cases reported were binovular.

The fact that the majority of the leading foetuses in cases of breech-and-vertex twin deliveries, where locking occurred between head and neck or chin and chin, presented as a complete breech is worth mentioning. This, so far as could be found, has not been commented upon by previous writers. It seems likely that a breech with flexed legs in the leading twin favours locking more so than in a breech with extended legs, which would prevent close contact between the head of the second twin and the thorax or neck of the first. A breech with flexed legs presented in the two cases reported.

Wright (1942) published three cases of locked twins. In two of them locking occurred between chin and chin, and in each case the first twin presented as a footling. In his third case locking occurred between the neck of the first twin, which again presented as a footling, and the flexed breech of the second twin. In the cases of Hunter (1927), Moore (1933), Spence (1937), Bowles (1938), Whitfield (1938), Nicolson (1942), Bradlow (1944), Greig (1946), Geggie (1947), Lawrence (1949, Case 3), Williamson (1953), and Swann (1957, Case 2), where locking occurred between chin and chin, the first twin presented as a flexed breech or a footling. Stenström (1951) described two cases of twin locking where the first twin presented as a flexed breech in one case in which decapitation had to be resorted to, and as a footling in the other where delivery was achieved by caesarean section. In the cases of Russell (1938), Love (1944), Macintyre and Barr (1951) (2 cases), and Gordon (1956) no specific mention was made of whether the legs were flexed or extended, but the description was often suggestive of a flexed breech. Lattuada (1951) described a case where locking occurred between the neck and chest of the first twin, which presented by the breech, and the head of the second twin, presenting as a vertex. The diagnosis was made radiologically, and consequently the delivery was accomplished by

caesarean section. There was no mention of the type of breech presenting, but from the x-ray film published it appeared quite likely that the legs were flexed.

In only two cases was it mentioned that the breech was a frank one (Kreis and Millet, 1958; Kimball and Rand, 1950).

Thus out of 27 cases reviewed (including the two cases here reported), where the first twin presented by the breech, 20 first twins had flexed legs or presented as a footling, in 5 cases the description was suggestive, and in 2 the breech was a frank one.

Treatment

Treatment can hardly be premeditated. Locking is usually diagnosed only during the delivery and very seldom during labour. Each case has to be managed individually. Disengagement should be attempted first, preferably under deep anaesthesia. Anaesthesia had already been administered before the diagnosis was made in Case 1, and thus no time was wasted in its induction as was done in the second case. If disengagement fails, decapitation of the first twin becomes essential, though caesarean section could be carried out, particularly if it is felt that decapitation would be associated with a greater risk of maternal trauma. Wright (1942) quotes McClintock, in Smellie's *Treatise of Midwifery*, who cited one case of locked twins in which decapitation was performed "with a bass string wrapped round with wire of a pianoforte."

Caesarean section has a place in cases of locking or "collision" between head and head or breech and breech when disengagement is not possible vaginally (Dawson, 1936; Preston, 1937), especially if the amount of liquor left is small (Cunningham, 1947).

Kimball and Rand (1950) described a case of chin-to-chin locking where the second twin was delivered with forceps past the first twin, which had been delivered up to the shoulders. The first twin weighed 4 lb. (1,814 g.) and the second 4 lb. 12 oz. (2,154 g.). Both were delivered alive. No mention was made of the size of the pelvis, but it must have been a large one.

Summary

Two cases of locked twins, chin to chin, are described. Disengagement vaginally was possible in both cases. In the second case the first twin was lost. The first twin was saved in the first case, where the mother was already under an anaesthetic. The fact that in the great majority of published cases of chin-to-chin locking the leading twin presented as a flexed breech is emphasized and is thought to bear an aetiological relationship.

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IS TRICHOMONAL INFESTATION A VENEREAL DISEASE?

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The evidence that *Trichomonas vaginalis* infestations are transmitted by sexual intercourse in most cases has been reviewed by Trussell (1947). He argued that the organism has its commonest habitat in the vagina, which suggests that it may be implanted by coitus. Many cases have been reported in which both sexual partners have been infected and in which the onset of symptoms in one of them dated from coitus with the other. The age when infestations occurred most commonly was suggestive of a venereal transmission. The condition was uncommon among children and virgins but most common between the ages of 16 and 35 years, which is usually the period of greatest sexual activity. Trussell pointed out that the disease is twice as common in negro women as in whites in the United States of America, and, though this has been attributed to poor hygienic habits, it could equally well be explained by greater sexual promiscuity. The frequent association of gonococci and trichomonads in the same patient suggested sexual intercourse as a means of transmission. King, Mascall, and Price (1936) were the first to point out the frequent association of the two diseases. Greenblatt (1945) found 66% of 127 prostitutes examined to have *T. vaginalis*, and 62.5% of another group of women with gonorrhoea to be also infected with the parasite. King and Gallagher (1946) found *T. vaginalis* in 30 out of 81 female patients with gonorrhoea.

Trussell also pointed out that the increased incidence of infestation in pregnant women suggested that infection might be favoured by the unprotected sexual act. Some authors have suggested that the routine use of chemical contraceptives gave some protection against

infection. Stein (1943) believed that trichomonal and mycotic infections were rare among women who used acid jellies for contraception. Wessels (1943), after investigating the records of 1,471 patients who practised contraception, was impressed by the low incidence of vaginitis.

At the First International Symposium on Trichomonal Infestations, held at Rheims in May, 1957, it was agreed by the majority of the delegates that human trichomoniasis was usually transmitted by sexual intercourse, that it was widespread throughout the world, and that the frequency of the condition was probably increasing.

However, the possibility of transmission of the parasite by other means has been suggested by several authors and cannot always be excluded. Instances have been reported of infection in members of the same family—for example, the mother and the female infants. Brady and Reid (1942) observed vaginal infection in a woman and in her 5-weeks-old baby. Trussell, Wilson, Longwell, and Laughlin (1942) examined 41 babies of women infected with *T. vaginalis*, and found that two were infected. They suggested that female babies may become infected from their mothers during birth.

McCullagh (1953) thought that infection was often transmitted by contaminated lavatory seats, but he gave no evidence to support this view. Whittington (1957) carried out experiments on the possibility of infection being transmitted in this way. She showed that *T. vaginalis* can survive for some time on lavatory seats, and is sometimes deposited on the seat by infected patients. The possibility of accidental infection by this means may therefore exist in some cases.

Lanceley and McEntegart (1953) regarded trichomoniasis as a venereal disease in the majority of cases, but believed that there was evidence to suggest that some infections were accidental, and warned against careless technique in vaginal examinations because they believed that infection could be spread by this means.

Other possible sources of infection that have been suggested include douche nozzles, enema syringes, towels, underwear, internal sanitary towels, and surgical instruments. Transmission by these means has never been proved.

Some investigators have regarded the intestine as the source of infection, believing that intestinal trichomonads could become adapted to the vagina. There is, however, no evidence that they can be successfully established in the human vagina (Stabler, Feo, and Rakoff, 1940). Nor is there any positive evidence to suggest that oral trichomonads will produce vaginal disease. The majority opinion at the Rheims Symposium rejected the view that contamination occurred from alimentary or animal origins.

Finally, it has been suggested that infection might be acquired by drinking infected water or eating infected food, or that it can be transmitted in swimming-pools or swimming-baths by infected water. Little or no positive evidence has been produced to support these views, and the balance of probability seems to be against such methods of transmission.

To summarize, therefore, the published evidence suggests that the most frequent method of transmission of *T. vaginalis* is by the sexual act, though in a small proportion of cases infection may be acquired by other means.