POST-PUERPERAL POLYNEURITIS

By V. ISWARIAH, B.A., M.B.B.S., M.R.C.P. (Edin.)
and
P. KUTUMBIAH, B.A., M.D., M.R.C.P. (Lond.)
(*From the King George Hospital, Vizagapatam*)

THOUGH the last word on the ætiology of beri-beri has not yet been said, it is generally accepted by clinicians, experienced in this disease, that the avian polyneuritis induced by avitaminosis is not clinically identical with human beri-beri. Megaw (Megaw and Rogers, 1930), after enumerating at length the debated points with reference to the ætiology, added that he did so in the hope that some readers might seize any opportunity, which came their way, of making contributions to the knowledge of beri-beri. We have had the opportunity of observing, during the past few months, a variety of polyneuritis occurring in women during the puerperium. The neuritic condition that is described below appears to be the only condition, occurring in an endemic area, that bears any resemblance to the well-recognized syndrome of beri-beri. An attempt has been made here to find out (*a*) if this polyneuritis is a variety of beri-beri endemic in the locality, (*b*) if so, what are the special ætiological factors that determine it, and (*c*) if not, what exactly the condition is.

Other records of puerperal polyneuritis.—Peripheral neuritis as a complication of the puerperium or of pregnancy has been noticed by some, though it is not a recognized complication or sequel of pregnancy or the puerperium, such as are eclampsia, toxæmic kidney, anæmia and hyperemesis. Wilson and Garvey (1932), while drawing attention to three other presumable toxæmias of pregnancy, *i.e.*, psychosis, impetigo gestationalis and certain types of multiple polyneuritis, described three cases of polyneuritis gravidarum in the later weeks of pregnancy. They hold the view that ordinarily the symptoms subside with the puerperium in cases where they start during the later months of pregnancy. Having had only three cases, they observe that, while the condition of polyneuritis has been recognized as a complication of pregnancy and the puerperium for a long time, it occurs not very frequently in the severe forms, and no one person has had the opportunity of observing a large series of cases.

Churchill (1854) discussed the possibility of this condition being of a toxic nature, after collecting 33 examples. Most of his cases showed albuminuria, which lent support to the idea that it was a toxæmia of pregnancy.

Mopuss (1887) reported seven cases of peripheral neuritis all occurring in the puerperium and with no associated general disturbance.

Lindeman (quoted by Wilson and Garvey, 1932), in fatal cases of this type, found at autopsy, in addition to lesions of various peripheral nerves, fatty degeneration of the liver and cloudy swelling and degenerative changes in the kidneys. Similar lesions were found in the liver and kidneys of the fœtus.

Von Hosslin (1905) collected 94 cases, from the literature and his own experience. His series included all types, in some only a single nerve being involved, in others groups of nerves, while still others were of the severe type with progressive general paralysis, vomiting and

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developed organs. The high implantation of the ureter and the sharp uretero-pelvic angle, which prevent free drainage, are the most common causes of disease in these kidneys. Consequently it is explicable why recurrence of stone is usual. The prognosis is worse in the case of infected calculi. From an analysis of the records of the Calcutta Medical College hospitals, the infrequency of nephrolithiasis is very striking. A rare case of calculous hydronephrosis in a horse-shoe kidney in an Indian female was described by Marchant (1931). The diagnosis however was made during operation.

Summary

(1) A case of nephrolithiasis of the horse-shoe kidney with interesting anomalies has been described.

(2) In this connection the surgical records of the Calcutta Medical College hospitals for the last three years and the post-mortem records for the last 18 years have been investigated and are summarized.

(3) A pre-operative knowledge of the existence of a horse-shoe kidney is a great advantage, owing to the dangers and difficulties caused by the various anatomical anomalies.

I wish to express my gratitude to my senior colleague Professor L. M. Banerjee for his kind permission to publish this case. My best thanks are due to Dr. M. N. De, Professor of Pathology, for his kindness in giving me free access to the hospital records, to Dr. G. Galstaun, the honorary radiologist, for the excellent skiagraphy, and to Dr. R. R. Roy, our senior house surgeon, for his valuable help.

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mental disturbances. In cases with generalized paralysis the mortality was 20 per cent. Von Hosslin did not advocate termination of pregnancy as a necessary means of alleviating the condition. In not a few patients the first symptom appeared in the puerperium, several days after the pregnancy had come to an end.

Among the more recent series is that reported by Albeck (quoted by Wilson and Garvey, 1932) who presented 9 cases of the severe type, with vomiting, psychosis and progressive paralysis. In 7 of them pregnancy was interrupted; all apparently recovered though the convalescence was prolonged and months elapsed before normal muscular function was restored.

Seitz (1892), having excluded all other possible causes, regards the disease as of toxic origin. Only in cases of suspected optic or phrenic nerve paralysis was interruption of pregnancy called for. He cites a case of A. Mayer's treated successfully during pregnancy by the injection of 10 c.cm. of serum from a healthy pregnant woman.

Wilson and Garvey (*loc. cit.*) attempted to study the changes which occur in the general metabolism of such patients. Their cases, that are the most recent to come to our knowledge, are of the following nature. Extensive polyneuritis was associated with pregnancy in its later stages. At the onset of the illness severe and persistent vomiting was noticed with profound mental disturbances. They were satisfied that such toxic agents as alcohol, lead, and infection had no ætiological bearing in these cases. They further said that it was impossible to make any definite statement in regard to the exact ætiology, and for the present the condition must remain in the category of unsolved problems, in common with other toxæmias of pregnancy. They noticed in these cases a peculiar disturbance of the general metabolism characterized particularly by a high carbon dioxide combining power and low blood chlorides. The findings were suggestive of alkalosis. None of these women had any alkaline medication during their illness. None showed any appreciable respiratory disturbances. All had persistent vomiting prior to admission. In the presence of defective elimination alkali might still be retained, and the CO_2 combining power then would remain high. The authors go so far as to offer the suggestion that vomiting was not alone the cause of alkalosis.

Recently other workers in this part of India have observed this condition though they have only made a passing reference to it. Kamath (1931), whose observations are from this very area, when discussing the diverse conditions associated with polyneuritis said that the puerperal period is often complicated by this condition. 'It may also be noted', he said, 'that the puerperium may predispose to beri-beri. In the Circars, beri-beri by a transferred epithet is called "Suthika", which literally means the puerperal period'. Raman and Mahadevan (1930) while studying beri-beri in the neighbouring district of Guntur recorded that the incidence amongst males was higher at all ages except between 15 and 20. In most cases in women the ailment is subsequent to the first childbirth. They give the clinical picture of fever of a few days duration, weakness of the lower extremities, œdema of the calf muscles, and tenderness and anæsthesia of the legs with loss of knee jerks. They recorded five cases of post-puerperal neuritis in 18 months. This, according to them, is different from beri-beri occurring in pregnant women. The symptoms were weakness of both the legs and inability to walk, coming on three or four weeks after pregnancy. In all these cases there was a slight white discharge from the uterus. Col. Hingston suggested sub-involution and sepsis as the cause of the condition, as the patients got well when the discharge stopped.

The present series.—In our series of 24 cases, observed during fifteen months, there was discharge from the uterus in only one case, and no septicæmia or toxæmia. The infant was invariably nursed by the mother and grew satisfactorily.

TABLE

Cases of polyneuritis admitted into the medical wards during the past fifteen months

Sex and condition	Number of total admissions	Number of cases of polyneuritis		
Males ..	1,737	54		About 3 per cent.
Females ..	415	24	Puerperal.	About 6 per cent.
		3	Non-puerperal.	Under 1 per cent.

The mean age of the 24 cases of post-puerperal polyneuritis was 28 years, the youngest was 16 and the oldest 50. Ten of these were primiparæ. There was one death, and 15 were relieved of their symptoms at the time of discharge.

History and clinical picture.—The typical history of a woman admitted for polyneuritis during the puerperium was as follows. The woman went through her period of pregnancy and labour without any untoward event. She had been on a special diet for a fortnight after labour, but from the history there was nothing to suggest any noxious dietetic principle likely to cause polyneuritis. About two to three months after the labour, the patient had subjective symptoms of tingling shooting pains, cramps, etc., in the legs, often severe at night. About 30 per cent of cases gave a history of general anæmia and fever for about ten days preceding the attack of neuritis. Later, there

was weakness of the legs with inability to walk without help. The feeling extended to the upper extremities in more than 50 per cent of the cases.

On admission, a distinct wasting of the muscles of the lower extremities was noticed, with the feet in the drop position. The calf muscles were tender. Deep reflexes were lost. The soles were hyperæsthetic and a flexor response was elicited in most cases. The abdominal reflexes were always present. The patient occasionally complained of heaviness in the chest, but had no appreciable dyspnœa at rest or on moderate exertion. A few patients showed œdema of the legs persisting after the original anasarca had disappeared.

The infants in about seventy per cent of the cases were alive and healthy, with the mother suckling them. The temperature was normal, but the pulse was invariably in the neighbourhood of 100. The blood pressure was normal in sixty per cent of cases, moderately raised in the rest. The heart was normal on physical examination, and the urine had no albumin.

For comparison with this picture that of cases of 'beri-beri' admitted on the male side about the same time is given. Sturdy well-built men, between 30 and 45 years of age, were admitted with diffuse œdema over the neck, chest and limbs, and complaining of cramps and tingling in the extremities. The patients were often dyspnœic, though they preferred the recumbent posture. On physical examination, the heart was often found enlarged, and the sounds feeble or replaced by a murmur. The blood pressure showed a distinctly low figure for diastole and often for systole as well. In about half the cases treatment with minute doses of adrenalin was of no avail. With the others, rest and adrenalin with vitamin B in the form of Bemax, yeast, marmite, germinating 'gram' or toddy had a delayed but satisfactory effect.

Diet : The diet of an average individual admitted with signs and symptoms of polyneuritis did not materially differ from the diet of the patients in the ward who were not suffering from this disease; the proportions of carbohydrate, protein and fat work out roughly at 10:2:1.

Discussion.—A study of the literature on polyneuritis shows that it is not a recognized complication of the puerperium.

Other possible coincident factors to account for this ailment were absent, such as alcohol, lead, arsenic, mercury, organic or vegetable toxin. There is the possibility of auto-intoxication. Apart from our failure to detect such a source, polyneuritis of the puerperium has not been observed in such numbers anywhere else, as far as our knowledge goes, except in one other area, referred to below, where beri-beri is endemic.

It is then to be decided if the condition is a variety of beri-beri and if so what causes the high incidence during the puerperium. There is evidence for the assumption that the condition —be it a toxæmia, toxi-infection or vitamin lack—tends to assert itself as a neuritis after devitalizing states, such as fever, or in a woman after the strain of pregnancy, parturition or lactation. Often the first pregnancy was the inauguration of this symptom-complex. Grey (1928), while investigating the 'pre-beri-beri' condition with special reference to its existence in Japan, observed that in any deficiency disease two conditions are essential, *i.e.*, the accessory factor and the factor to which it is accessory. Though an adequate supply of vitamin B may hide the ill-effects of an unbalanced diet there must be an underlying weakness in the organism and this may suddenly become manifest when the vitamin is withheld. Such an underlying weakness might be expected to develop into true beri-beri without any diet changes merely as the result of adverse conditions such as excessive heat or humidity, lack of exercise, fatigue, and super-added intoxication—and pregnancy, if we may add to his list.

Acosto-Sison (1928) while investigating neuritis in the Philippines noticed that it was quite common among the Philippino parturients. Many of his co-workers held the view that the condition was beri-beri. The babies of mothers so affected, when breast fed, succumbed to infantile beri-beri. Paræsthesia and tingling were present over the trunk and extremities, and occasionally œdema. The last two months of pregnancy were the most usual time for the occurrence and in some cases the symptoms disappeared with parturition. In some the symptoms persisted for two or three months after labour and in the extreme grades of the disease, *i.e.*, those showing muscular wasting and foot drop, recovery took five months or more. No differences in diet were found between the sufferers and non-sufferers. Semi-polished rice, fish and vegetables formed the main part of the diet.

This author was inclined to the view that the condition is a toxæmia of pregnancy. True beri-beri cases seen in the Philippine General Hospital tended to be immune after one attack, but in the malady under discussion the symptoms often recurred in successive pregnancies. It is interesting to note that the neuritis is by far the most frequent in primiparæ, both in his series and ours. He also mentions the possibility of pressure on pelvic nerves as a possible causative factor.

What baffles us, while reading the report, is why a similar neuritic condition, if it is just a toxæmia of pregnancy or pressure on pelvic nerves, should not have been observed in other parts of the world, whereas in our search of the literature on this subject we can only find references to similar conditions in areas where beri-beri is present as well.

Acosto-Sison summarized his observations by saying that beri-beri does exist both in mothers and babies, but that all neuritic symptoms among parturients are not of beri-beri origin. One observation of his which tallies with ours is that mothers who have beri-beri, or rather polyneuritis, rear quite healthy babies. The point that strikes one in this observation is that beri-beri is possibly not a toxæmia, or at any rate the toxin is not inimical to the growth of the baby. Avitaminosis as the sole factor in the causation of beri-beri is not a tenable hypothesis, in the light of many investigations. Even if it is due to toxins, two factors are necessary for the manifestation of the symptoms of beri-beri—the 'predisposing' and the 'exciting', let us call them for want of better terminology.

Chopra and Acton (1925) in concluding their elaborate observations on beri-beri said that susceptibility played an important part when the amount of poison ingested was small. They instanced the small incidence of beri-beri in a jail population with a constant diet. Hypo-adrenalæmia in particular and hypo-thyroid to a lesser extent increase the susceptibility towards the poisonous bases which cause epidemic dropsy and beri-beri. They cited the colour of animals as markedly affecting the ease with which beri-beri could be produced, and pointed out that colour is associated with the endocrine mechanism. Autopsy of beri-beri cases often showed hypertrophy of the suprarenals. That there is deficient adrenalin in circulation and that an effort is made by the hypertrophy of the glands to make good the deficiency, seems to be fairly evident.

Does pregnancy bring about a condition of hypo-adrenalæmia or is there an exhaustion of adrenal activity immediately after labour which precipitates the symptoms of beri-beri when the other factor is already present.

Cannon (1929) has formed a very definite view regarding the ætiology of beri-beri, based on two years' observation in over 600 Chinese patients and 80 autopsies, helped by animal experiments. He says in conclusion, 'beri-beri is a syndrome of the orient confined to orientals chiefly males—seasonal in occurrence, prevalent during the wet season—partly infective—a rice disease—brought about by three factors (1) water-soluble vitamin B deficiency, (2) a bacterial infection closely resembling or identical with *B. asthenogenes* of Bernard (1919) and (3) an endocrine organ disturbance'.

Shiroki and Zakeshi (1929) claim that beri-beri is a syndrome caused either by lack of vitamin B or increased excitability of the sympathetic nervous system—a condition of neurasthenia sympathetica. By repeated electrical stimulation of the sympathetic nerves in the legs of rabbits, a condition resembling human beri-beri was produced. The incidence of beri-beri is

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STUDIES IN UNTREATED MALARIA

By JOHN LOWE, M.B., CH.B.
Research Worker in Leprosy under the British Empire Leprosy Relief Association, Indian Council
(*From the Calcutta School of Tropical Medicine*)

MALARIA DUE TO *P. vivax*

Introductory

DURING the last few years, the treatment of neural syphilis by the artificial induction of

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correlated by these authors with climatic and meteorological conditions, age, sex, pregnancy and other factors that influence the sympathetic mechanism.

The unstable sympathetic system associated with pregnancy and labour and the concomitant upset of endocrine balance have, to our minds, a great deal to do with the appearance of symptoms of polyneuritis after parturition, in an area where the other contributory causes of beri-beri are present.

Conclusions

(1) Peripheral neuritis is not a commonly recognized complication of pregnancy nor of the puerperium.

(2) Peripheral neuritis is common in the puerperium in Vizagapatam, which is an endemic area of beri-beri.

(3) These cases differ in their clinical picture from those of true beri-beri.

(4) These cases are to be regarded as peripheral neuritis occurring in persons who are otherwise predisposed to beri-beri.

(5) Pregnancy—particularly in the later months—and the strain of labour seem to induce endocrine imbalance or other disturbance, and it is suggested that this may be the mechanism by which an attack of peripheral neuritis of this type is precipitated during the puerperium, in persons living in an endemic area.

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