during labour but also during the latter part of pregnancy. Any abnormal symptom, particularly that of lower abdominal pain, must be regarded with suspicion.

Summary

Rupture of the uterus during a subsequent pregnancy or labour is not uncommon in those who have undergone Caesarean section. This type of rupture has been divided into five groups and the characteristics of each group briefly indicated.

My thanks are due to Dr. F. Lacey for permission to quote the case of Mrs. X. under Group I.

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THE NERVOUS COMPLICATIONS OF MEASLES

BY

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Nervous complications, it is recognized, follow most of the exanthemata, and the incidence is probably highest after measles. Boenheim (1925) gives the incidence in Berlin as 0.4 per cent., and this may not be considered an over-estimate if we remember that, as well as the severe cases which impress so much as to be included in the literature, we must also include the minor cases of mere drowsiness or slight meningeal irritation.

Pathology

This has been studied by Wohlwill (1928), Ferraro and Schaffer (1931), and Greenfield (1929). The last-named has summarized the abnormalities to be found in the central nervous system under three headings: (1) congestion and haemorrhage; (2) perivascular infiltration; (3) perivascular demyelination. The pathological findings appear to be identical with those occurring in post-vaccinal encephalitis, and in the forms of encephalitis following certain other acute fevers (as, for example, mumps and chicken-pox); it has therefore been suggested, especially by Greenfield, that the post-vaccinal and other forms of encephalitis which follow eruptive fevers are not directly due to the virus of the preceding fever, but to another independent virus which is either stimulated to activity or is directed against the nervous system by the exanthem. The phenomenon of demyelination also occurs in disseminated sclerosis and Schilder's disease, and it is possible that there is some connexion between them. The changes in the cerebrospinal fluid are variable. There is usually a moderate increase in the cells, mainly lymphocytes, up to about 200 per c.mm. The protein may also be increased.

Clinical Manifestations

These have been summarized by Ford (1928), who collected most of the authentic cases in the literature and added twelve of his own. He distinguishes six groups:

1. Mild and Transient Diffuse Cerebral Symptoms.—These include stupor, headache, vomiting, and possibly

even convulsions. There may be a suggestion of meningism, but the symptoms point to involvement of the brain rather than the meninges, and to a general toxic effect rather than local inflammatory damage. These cases may recover completely or may pass into one of the further groups.

2. Multiple Focal or Diffuse Lesions of the Nervous System.—The accompanying physical signs include spastic weakness of the extremities, tremor, choreic or athetoid movements, aphasia, or ataxia; or the condition may simulate either tuberculous meningitis or epidemic encephalitis.

3. A group of single focal cerebral lesions, aphasia or hemiplegia being the commonest symptoms.

4. Cerebellar Syndromes of Varying Degrees of Severity.—There may be localized or generalized ataxia, intention tremor, loss of muscle tone, slow or scanning speech, and nystagmus.

5. Paraplegia and Spinal Cord Syndromes.—An acute ascending paralysis may occur.

6. Other nervous complications—for example, toxic psychoses, and papilloedema.

The whole series of Ford's cases yield a mortality of about 10 per cent., which compares favourably with the mortality of 58 per cent. in post-vaccinal encephalitis in the English epidemic of 1922–3. About 60 per cent. of the survivors showed residual symptoms, such as weakness, ataxia, mental defect, or personality change. The time of occurrence of the nervous symptoms was extremely variable; they might appear as early as the height of the fever or even in the prodromal period, or as late as a month afterwards. The commonest times were on the third, fourth, or fifth day of the exanthem, and between the tenth and twentieth days of convalescence. As might be expected, the incidence was mainly in childhood, following the much higher incidence of measles at this period.

Case Report

The following case is an example of the post-febrile variety of measles encephalitis.

The patient was a married woman aged 31 with two children aged 6 and 3. The elder child was taken ill on August 26, 1936, and when seen by his doctor on the 29th presented a typical mild attack of measles, from which he made a good recovery. The younger child became ill on September 8. His rash did not appear till the 14th, six days later. He also made a good recovery.

On September 21 the mother complained of headache, malaise, and aching pains in the limbs; there was some coryza. The doctor saw her on the 23rd; her temperature was then 101° F., there was no rash, and no Koplik's spots were seen. In spite of this, measles was still suspected, as she had not previously had an attack. Her main complaint was of cough, but no physical signs were found in the chest. She had definite photophobia, preferring the blinds down. On September 27 two or three Koplik's spots were found, and the diagnosis seemed certain. No rash, however, developed; a temperature of between 100° and 103° F. persisted, together with the cough, which was associated with no physical signs until October 3, when there were moist sounds at the left base.

On October 5 she was admitted to Addenbrooke's Hospital, Cambridge, under the care of Dr. C. H. Whittle. She was then mentally depressed and looked ill, with slight cyanosis and an increased respiration rate. The only physical signs were in the lungs posteriorly, low down between the scapulae, where there was impairment of note, with bronchial breathing and fine rales. Her condition improved, and by October 8 there were no physical signs, her temperature was normal, and a radiograph of her lungs showed no lesion.

At about this time she became euphoric and her depression departed; it was also noticed that her speech was becoming slurred. On October 11 slurring was more pronounced, and she volunteered the statement that she saw double on looking to the left. On examination her pupils reacted to light and accommodation, but the left pupil reaction was not sustained. There was no ptosis, and no abnormalities of the cranial nerves were detected except for weakness of both sixth nerves, especially the left. There was no weakness or altered sensation of the limbs, but all tendon reflexes were exaggerated; the plantar responses were equivocal. The fundi showed some blurring of the disk margins—about the same on both sides.

October 14.—Lumbar puncture was performed. The fluid was not under increased pressure; it was contaminated by blood, and so useless for further tests.

October 16.—The patient started vomiting, and did so several times daily for the next three days, the vomiting being unaccompanied by nausea.

October 19.—Speech was still slurred and there was marked euphoria. Slight facial weakness was observed on the left side only. The disks were still slightly blurred. There was intention tremor of both hands, more on the right; and dysidiadokokinesis of the right hand, with past-pointing to the right. The tendon reflexes were exaggerated; abdominal reflexes were absent on the left and weak on the right.

October 26.—The weakness of face and alteration of reflexes were much less marked. There was nystagmus, coarse and horizontal on looking to the left, finer and vertical on looking to the right. There had been very marked mental weakness, with delusions and hallucinations, during the preceding days, but this had slightly improved.

October 30.—Her speech had now become more articulate and lower in pitch, and her appearance was more that of a normal woman. Practically all physical signs had disappeared, except intention tremor on the right and some nystagmus on looking to that side.

November 17.—She was at this date discharged quite well, having been able to walk and to look after herself for over a week.

AFTER-HISTORY

November 26, 1937.—A little more than a year after her discharge the patient attended the follow-up department. She had been very well and fit in every way, both mentally and physically, and neither she nor her family had noticed any sequelae. On examination, reflexes, tone, power, and sensation were all normal, as were the fundi. There was slight intention tremor, more marked on the right hand. Dysidiadokokinesis was present on the right, and there was slight horizontal nystagmus on looking to that side. The position sense was normal.

Discussion

There would seem to be no doubt at all that this was a case of encephalitis beginning with multiple focal and diffuse lesions, and later concentrating on the cerebellar functions. Fortunately, the sequelae were minimal, affecting cerebellar function only and unaccompanied by mental defect or personality change.

The possible differential diagnosis of acute disseminated sclerosis would seem to be excluded on two counts: first, by the mental symptoms in the acute attack; and, secondly, by the absence of any further development in over a year.

Whether the illness followed an atypical attack of measles without the rash can be less certainly claimed. The existence of these *formes frustes* of measles is well recognized. Box (1937) states: "Some of the mildest attacks are aberrant, the rash failing to appear, and only Koplik's spots giving a clue to the disease." Blackfan (1933) says: "... the fever and catarrhal symptoms may follow the usual course with an eruption which is

scanty or atypical. Koplik's spots are found even in the atypical cases." The same period of thirteen days existed between the illness of the first and the second child as between the second child and the mother, while the second child took longer than usual to develop the rash. In both their cases the measles was mild in type. The clinical development of the illness was such that there can be little doubt that it was measles. Koplik's spots were seen, and the chest symptoms and early photophobia were characteristic. Only the rash was lacking.

My thanks are due to Dr. C. H. Whittle for permission to publish the case.

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SULPHANILAMIDE THERAPY IN MENINGOCOCCAL MENINGITIS

REPORT ON THREE CASES

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The following cases are considered worth reporting in view of the widespread interest in the treatment of meningococcal meningitis by drugs of the sulphanilamide group. Two of these cases were due to a Type I meningococcus; the second is included because, although bacteriological evidence was lacking, the case both clinically and epidemiologically was almost certainly of a similar type. The site of the disease in meningitis is accessible by spinal puncture, and the inflammatory exudate can be seen, estimated, and readily examined by cytological and bacteriological methods in a way that is rarely available in other acute infections.

Treatment

1. Prontosil soluble was given intravenously (20 c.cm. of a 2.5 per cent. solution), and this dose was repeated at eight-hour intervals for from two to three days. In addition 1½ grammes of prontosil album were given in the twenty-four hours by mouth. The first two or three intravenous injections were followed almost immediately by vomiting, which was not repeated with subsequent injections; apart from this no ill effects were noticed.

2. All prontosil was stopped forty-eight hours after the cerebrospinal fluid became sterile and the cell count had dropped to a fairly low level. Contrary to L. J. Willien's experience this was not followed by a relapse; he continues the drug by the mouth for ten days after the symptoms and laboratory findings have returned to normal.

3. In addition anti-meningococcal serum was given intrathecally twice a day for three days. This is