be felt, and the blood pressure was 70/? . Her condition continued to improve, and by midday the blood pressure was 120/80 and her condition satisfactory.

The child was a boy weighing 7 lb. 4 oz. (3.29 kg.). At necropsy no abnormality was found except some congestion of the liver.

A careful history was taken. The patient had never had any similar attack before. On the previous day she had eaten her normal diet and taken nothing unusual. She did not find that any food "disagreed" with her. During labour she had nothing to eat, and drank only tea and water. With the exception of pethidine, only gas-and-air analgesia was used.

It was therefore felt that the reaction was probably due to pethidine, and the following test was carried out with the patient resting in bed. The blood pressure was taken and 50 mg. of pethidine was given by intramuscular injection. Blood pressure readings were taken every half-hour for six hours.

Time	B.P.	Remarks
10.15	120/75	
50 mg. pethidine given I.M.		
10.45	120/80	
11.45	110/75	
12.15	110/70	
12.45	110/70	
1.45	110/80	
2.25	90/60	Marked puffiness of face. "Drawing" feeling in skin
2.40	90/65	No puffiness of face
3.10	105/70	
4.00	100/65	

In the test the maximum fall in blood pressure of 20 mm. Hg systolic and 15 mm. Hg diastolic occurred four hours after the injection of pethidine. During labour, collapse occurred 3½ hours after the pethidine injection.

It seems reasonable to conclude from the results of this test that the reaction during labour was caused by pethidine. The case also demonstrates that, even with normal dosage of a commonly used and usually safe drug, unexpected and serious reactions may occur, endangering the lives of both mother and child.

I would like to thank Dr. Jeffery Jones, medical superintendent, for permission to publish this case, and Dr. J. Graham, lecturer in pharmacology, Welsh National School of Medicine, for his assistance and advice.

REFERENCES

- Benthin, W. (1940). *Dtsch. med. Wschr.*, **66**, 760.
 Branwood, A. W. (1943). *Edinb. med. J.*, **50**, 177.
 Eisleb, O., and Schaumann, O. (1939). *Dtsch. med. Wschr.*, **65**, 967.
 Gruber, C. M., Hart, E. R., and Gruber, C. M., jun. (1941). *J. Pharmacol.*, **73**, 319.

According to the latest annual report of the Medical Defence Union, membership of the Union on July 17, 1951, stood at 35,700 practitioners. It is noted that the Medical Act, 1950, which is now law, has introduced changes in the mode of conduct of disciplinary cases before the G.M.C., and it has been decided to open membership of the Union to the newly qualified during the intern year they must do before they are permitted on the *Medical Register*. During the year 1950, 2,135 cases were conducted, among them one where a member with an emergency commission in the R.A.M.C. was posted as commanding officer of a hospital and gynaecological specialist, but was not promoted to temporary major, the rank held by his predecessor. The War Office at first refused to grant him higher status and pay, but the solicitors to the Union were able to show that the military authorities had wrongly interpreted their own regulations, and he secured his promotion.

HERPES ZOSTER WITH INVOLVEMENT OF ANTERIOR HORN CELLS

BY

J. H. McINTYRE, M.D.

(From Grey Hospital, Greymouth, New Zealand)

The following case may be of interest, as motor disturbances are rarely seen in herpes zoster.

Case Report

A man aged 40 was admitted to hospital on May 8, 1950. He complained of an irritating rash on his inguinal region and buttocks of the left side. He gave a history of having been in hospital a week previously for a lacerated face, for which he received prophylactic injections of penicillin. While in hospital he felt an irritation in the skin of the left buttock and extending round to the inguinal region and lower abdomen in front. Shortly after discharge he noticed a rash on those areas. He had never been in contact with chicken-pox so far as he knew.

Examination showed that he was a middle-aged man of rather nervous temperament. His temperature was 100.2° F. (37.9° C.), pulse 90, respirations 20. He had a typical herpes zoster involving the left buttock behind, the left inguinal region in front, and also the suprapubic region, the segments affected being the first to third lumbar. It is perhaps noteworthy that the herpetic vesicles passed slightly beyond the midline of the lower abdomen for a distance of ½-1 in. (1.25-2.5 cm.).

The vesicles were painted with collodion and he was given 1 ml. of pitressin daily for three days. The vesicles dried up satisfactorily, but on May 15 he complained of pain on the medial side of the left thigh in its upper third, and there appeared to be some loss of power in the left leg. The next day the knee-jerk and ankle-jerk were absent, as also was the plantar reflex. He complained of considerable pain in the whole of the quadriceps and medial side of the thigh on movement. There was also ½ in. (1.25 cm.) of muscular wasting. There was no fibrillary tremor.

Lumbar puncture showed no increase of pressure, and clear fluid was obtained. On examination this was found to contain 62 cells per c.mm., of which 56 were lymphocytes and 6 polymorph leucocytes. There was a slight increase of globulin by Pandy's test.

The haemoglobin and red-cell counts were normal, and the white-cell count was 9,700 (neutrophils 68%, lymphocytes 28%, monocytes 3%, eosinophils 1%).

On May 18 the patient had more marked paresis of the left leg, with absent reflexes and pain on attempted movement. By May 25 he was completely paralysed in the left leg, with loss of all tendon reflexes and 1 in. (2.5 cm.) of muscular wasting. He had severe pain on passive movement. He was anaesthetic in the areas where the herpetic vesicles had been present—that is, in the area supplied by the first to third lumbar segments.

By June 2 movements in the affected limb were slowly beginning to return, and by June 18 he could move the limb a little and the ankle-jerk had returned, the plantar reflex was flexor, but the knee-jerk was still absent. There was, however, still pain on movement.

This was thought to be a case of virus infection of the anterior horn cells of the first to third lumbar segments, which had spread over from the posterior horn cells or the posterior root ganglia, where it had caused a typical herpes zoster.

The similarity to acute anterior poliomyelitis was, however, striking, and the results of lumbar puncture rather supported this diagnosis; on the other hand, the paralysis was not maximal in onset, but came on very slowly. In addition, there was no neck or spinal rigidity, and this district has been free from poliomyelitis for a considerable time.

Discussion

Broadbent in 1866 was the first to describe a case of herpetic eruption in the course of branches of the brachial plexus followed by partial paralysis in corresponding motor nerves. Since then relatively few cases have been observed, although much interest has been shown in this condition. Taterka and O'Sullivan (1943) reported two cases of zoster with motor complications—one affecting the upper limb and the other the lower. They stated that they had been able to collect from the literature 42 cases of herpes zoster with motor complications. In an analysis of these cases they note that the total number of cases is 44, and that the proportion of males to females is almost 3 to 1. They further state that paralysis of the muscles of the upper extremity occurred in 20 patients, or 45.5% of the cases. The trunk muscles were affected in 18 cases, or 40.9%, and, including their own two patients, there have been only six cases of paralysis of the muscles of the lower limb. They further state that the zoster eruption precedes the paralysis in about three-fourths of the cases and follows it in only one-fourth. The time interval between the eruption of the herpes zoster and the appearance of the paralysis varies from one day to two months. The eruption and the paralysis never appear simultaneously.

In the case under discussion the interval between the appearance of the herpetic eruption and the paralysis was precisely 14 days. Furthermore, there was a history of trauma in this case, but the relation of trauma to the aetiology of herpes zoster is problematic. It occurred in several cases in the literature, but no conclusive result is forthcoming.

The pathogenesis of herpes zoster is not well understood. It is usually stated that there is an inflammatory reaction of the dorsal root ganglia caused by a filterable virus, but how this virus arrives at the dorsal root ganglia is not known. Kinnier Wilson (1940) stated that it travels by the blood stream from the nasopharynx to the spinal ganglia, where it induces tissue reactions and then moves along the sensory nerves to the skin, producing a segmental eruption.

Other observers consider the disease to be an ascending neuritis. As regards the motor complications in herpes zoster it seems logical to assume that this is spread by continuity from the spinal ganglia to the anterior root. Kinnier Wilson, however, denies the existence of lesions of the anterior root and considers a spread of the virus among cell groups of ventral horns more likely.

Herpes zoster has been described as the sensory analogue of poliomyelitis, and the virus of zoster always attacks the sensory system, but the case here described and the other 44 cases mentioned give reason for thinking that the anterior horn cells or motor roots can also be affected. Whether there is any different strain of virus or type of virus that causes these uncommon motor complications can only be conjectured. Several observers have described these motor complications of herpes zoster as acute posterior poliomyelitis, and certainly the clinical findings and cerebrospinal fluid changes support this description.

Summary

A case is described of motor paralysis complicating a herpes zoster, the muscles affected being the quadriceps femoris and the vastus medialis.

The occurrence of this complication in the lower limbs is uncommon, only six previous cases having been reported.

The interval between the herpetic eruption and the onset of the paralysis was 14 days.

The distinction of this condition from acute anterior poliomyelitis can be difficult, as the cerebrospinal fluid changes are similar in both diseases, but the paralysis is of more gradual onset in the motor complications of herpes zoster.

I am indebted to Dr. R. H. Quentin Baxter, of Christchurch, for literature and advice on this subject.

REFERENCES

- Broadbent, W. H. (1866). *British Medical Journal*, 2, 460.
Taterka, J. H., and O'Sullivan, M. E. (1943). *J. Amer. med. Ass.*, 122, 737.
Wilson, S. A. Kinnier (1940). *Neurology*, edited by A. Ninian Bruce. Arnold, London.

Medical Memorandum

The Pneumatic Balance Valve and its Applications : a Preliminary Report

The pneumatic balance (P.B.) valve is a device for transforming a continuous gas pressure into an intermittent one. A P.B. valve interposed between a low-pressure source of oxygen, controlled by a suitable pressure regulator (demand valve), and a rubber bag will inflate the bag to approximately three-quarters of the pressure to which the demand valve has been set (the line pressure), and then cut off the oxygen and allow the bag to deflate through ports provided for this purpose. When the residual pressure of the gas in the bag has dropped to a predetermined value (say one-tenth of the line pressure) the process is again reversed and the valve continues to cycle so long as the line pressure is maintained.

FIG. 1.—The pressure balance valve.

The valve (Fig. 1) consists of a circular metal box, some 2½ in. (6.3 cm.) in diameter, with inlet and outlet connexions. The internal mechanism consists of two diaphragms linked together, which cover valve seatings of different diameters. The smaller valve controls the inlet of fresh gases; the larger valve is on the outlet side of the apparatus, and, owing to its mechanical advantage over the smaller one, to which it is linked, shuts off the flow of gas and opens the expiratory ports when the pressure in the bag reaches three-quarters of that of the demand valve.

Although first described in 1945 in the United States, the P.B. valve does not seem to have received much attention in this country, which is surprising because