which our patients had been relegated at an early stage in their illness. Too great a reliance cannot be placed on the colour of the patient's urine; early in the course of the illness of Case 3 the urine was of normal appearance. In diagnosis the Watson and Schwartz test for porphobilinogen is an extremely simple and valuable one which can be performed in any side-room; moreover, it is wholly reliable (Hammond and Welcker, 1948). It is possible that the more widespread use of this diagnostic test might bring to light many more mild cases of porphyria.

This question of early diagnosis and the diagnosis of mild cases is of more than purely academic interest. At present the disease defies comprehension, and treatment is for the most part supportive, attention being paid to nutrition, prevention of respiratory complications, and the control of pain. The supervention of profound and widespread paresis should not engender complete despair: Saint *et al.* (1952) described a case with paralysis of the diaphragm and intercostal muscles in which full recovery occurred after two weeks in a respirator. If we can do patients little positive good, there is certainly evidence that we can do positive harm. The unfavourable influence of sulphonamides and barbiturates on the natural history of the disease has been recorded too often to be ignored. Unfortunately the very symptoms with which the disease is announced—pain and psychotic behaviour—are those which often call for the empirical use of these drugs. The answer to the problem must lie in awareness of the diagnosis.

Like the understanding of the underlying metabolic anomaly, the origin of symptoms in porphyria remains obscure. There is much to support the contention of Denny-Brown and Sciarra (1945) that many of its manifestations are explicable on the basis of spasm of smooth muscle, particularly of the circular muscle of small arteries. The diffuse pathological changes seen in the central nervous system and elsewhere are highly suggestive of focal ischaemia. In this respect the variety of systemic manifestations—renal (hypertension), abdominal, neurological, myocardial—calls to mind that other disease of focal ischaemia, periarteritis nodosa. To the long list of organs involved in porphyria the pancreas must now be added, for the clinical, biochemical, and pathological evidence of mild pancreatitis in Cases 2 and 3 was wholly convincing. It is interesting in this connexion to note that pancreatic involvement sufficient to cause abnormality in the sugar-tolerance curve in periarteritis nodosa has been recorded by Middleton and McCarter (1935) and by Baker (1953).

Summary and Conclusions

A survey of the reported cases of acute porphyria in Australia indicates an approximate incidence of 1.5 per 100,000 females over the age of 15 years.

Three cases with classical biochemical findings are described in which the earliest symptoms bore little relation to the "classical" picture of the disease.

In two cases pain was entirely peripheral in distribution, and was attributed to mild infective illness. The unfolding of neuropsychiatric symptoms and signs followed the administration of barbiturates.

In two cases the abdominal pain was due to pancreatitis, proved biochemically and at necropsy.

The importance of early recognition is stressed so that the harmful influences of sulphonamides, barbiturates, electric convulsion therapy, and unnecessary surgery may be avoided. The more widespread use of the simple Watson and Schwartz test in the diagnosis of obscure abdominal and peripheral pain, hysteria, unexplained depressive states, and neuropathy is urged.

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ACUTE PANCREATIC NECROSIS AS A CAUSE OF SUDDEN DEATH

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Acute pancreatic necrosis has long been recognized as an acute and frequently fatal abdominal catastrophe, but it does not usually figure as a cause of sudden death. Roberts *et al.* (1950), however, mentioned the possibility, and Gaskell (1942) described 10 cases of sudden death from this condition.

During the past two years five cases have been encountered in the course of post-mortem examinations carried out at the Royal Victoria Infirmary, Newcastle-upon-Tyne, all of them investigated at the request of H.M. Coroner. In the following account a short summary of the clinical history of each case is given together with descriptions limited to the state of the pancreas and adjacent organs and any other positive findings.

Case Histories

Case 1.—A public works contractor aged 48 (weight 112 kg.), an obese subject enjoying good health, was suddenly seized with acute abdominal pain. He became breathless at work, collapsed, and died instantly. A month previously he had suffered an attack of "food poisoning," with subsequent recovery. *Post-mortem Examination:*—The pancreas (weight 200 g.) was soft and swollen, and the cut surface showed diffuse areas of haemorrhage with a limited amount of fat necrosis. Histology confirmed a severe necrosis of the pancreas with abundant haemorrhage. Stomach and duodenum contained a recent meal; the mucosal surface appeared congested. The liver showed severe fatty change. The lungs were congested and very oedematous.

Case 2.—A brewer's cooper aged 62, well nourished and of good physique (weight 70 kg.), who normally enjoyed good health, suddenly complained of abdominal pain whilst at work. His colleagues saw him collapse. He lost consciousness and died instantly. *Post-mortem Examination:*—The pancreas (weight 160 g.) was dark plum-coloured and flecked with yellowish necrotic material. Histology showed a haemorrhagic necrosis of pancreatic tissue with limited fat necrosis. The stomach, duodenum, gall-bladder, and bile ducts appeared normal. The lungs were severely congested and oedematous.

Case 3.—An obese elderly woman aged 73 (weight 65 kg.), living at home, had been under the care of her doctor for several years on account of thrombophlebitis in her right leg. She developed symptoms suggesting pulmonary embolus a few weeks before death, but subsequently recovered. On September 10, 1952, she got out of bed at 10 a.m., suddenly collapsed, and died. *Post-mortem Examination:*—The pancreas (weight 140 g.) was swollen, soft, and oedematous, with numerous subcapsular haemorrhages. On section one major haemorrhage was seen in the head of the pancreas with numerous smaller ones throughout the gland. There was a minimum amount of fat necrosis. Histology showed a complete necrosis of the parenchyma with perivascular haemorrhages. The stomach and duodenum contained a recently ingested meal. The gall-bladder contained numerous pigment stones, but the mucosa was normal in appearance. The bile ducts were healthy. The splenic vein contained a recent ante-mortem thrombus. The main pulmonary arteries contained ante-mortem thrombi, which were firmly adherent to the vessel walls and were shown histologically to be in varying stages of organization. There was moderate atheroma of the coronary arteries but no recent thrombus. Two large simple cortical cysts were present in the left kidney. There was an extensive organized thrombus in the right femoral vein.

Case 4.—A well-nourished woman aged 69 (weight 58 kg.), living at home, had been in failing health for some months. She complained of sudden pain in the chest and brought up a small quantity of blood. The pain subsided, but the following morning she had a further severe attack of upper abdominal pain, collapsed, and died before her doctor arrived. *Post-mortem Examination:*—The entire pancreas (weight 145 g.) was found to be swollen and congested. Sectioning showed an extensive haemorrhagic necrosis of the head of the pancreas with smaller haemorrhages throughout the gland. Histology confirmed extensive necrosis of glandular tissue with diffuse haemorrhage and slight fat necrosis. The stomach contained altered blood and mucus, with congestion of the mucosa and scattered submucosal haemorrhages. The duodenum was moderately congested. The gall-bladder and bile ducts appeared healthy. The lungs showed oedema.

Case 5.—A general labourer aged 28, well developed and in good nutrition (weight 68 kg.), had been in normal health. On November 11, 1951, he ate a good lunch and shortly afterwards ran some distance and boarded a bus. On reaching his seat he was seen to slump forward, and by the time help arrived he was dead. He had been treated at the age of 16 for meningitis. In 1945 he had been wounded in the leg while serving with H.M. Forces in Germany. *Post-mortem Examination* showed a haemorrhagic necrosis of the head of the pancreas, which was confirmed histologically. The stomach contained a large quantity of recently ingested food; the mucosal surface was healthy. The duodenum was congested. The gall-bladder and bile ducts were healthy.

One further case deserves mention. A man aged 65, who had been in previous good health, was found by the police unconscious in his bedroom. In hospital he revived slightly with nikethamide, but relapsed into coma and died the following day. Subsequent necropsy revealed an acute haemorrhagic pancreatitis, which was confirmed by histological examination. In view of the delay between discovery and death, this case cannot be accepted as one of sudden death, but nevertheless it bears certain similarities to the series being described.

Comment.—The main necropsy findings in all cases were acute haemorrhagic pancreatitis with necrosis of the parenchyma. Fat necrosis was present in variable amounts but was not a prominent feature. The susceptibility of the pancreas to post-mortem autolysis was borne in mind in assessing the lesions, but in all cases the cellular activity and haemorrhagic infiltration indicated a genuine necrotic process. Sudden death was common to all cases. In Case 4

the history suggested two separate attacks, the second one being instantly fatal. In Case 3 the issue was obscured by a concurrent pulmonary embolism, but it was felt that the extent of the pancreatic lesions together with considerable organization of the majority of the pulmonary thrombi warranted the pancreatic condition being cited as the cause of death. In none of the cases was there evidence of coronary arterial thrombosis.

Discussion

The aetiology of this condition remains obscure. Certain authors regard the lesion as the result of auto-digestion by activated pancreatic enzymes, resulting from acinar rupture taking place at the height of enzyme secretion. The fact that the lesion may occur in the wake of a recently ingested meal would tend to support this idea. Lium and Maddock (1948) reinforce this interpretation by animal experiments in which they produced pancreatic necrosis in starving rats by ligating the ducts and then stimulating the gland by artificial means. The most extensive inflammatory changes followed ligation of the ducts at the height of digestion, approximately two hours after the animal had eaten. Paxton and Payne (1948) stressed the role of alcoholism as an aetiological agent. In two of the cases described above there was a history of alcoholic tendencies.

The possibility of the lesion being primarily the result of vascular disease must also be considered. In two of the above cases ante-mortem thrombi were located in pancreatic arterioles not immediately related to necrotic tissue. This would tend to suggest that in the more acute forms of the disease there may well be a primary arteriolar thrombotic process giving rise to acute haemorrhagic infarction of the pancreas, with subsequent liberation and activation of gland enzymes. At any rate, the arteriolar lesions probably succeeded in promoting extension of the lesion if not in initiating it, and may well be a main factor in rendering this type of pancreatic necrosis an irreversible and frequently fatal disease.

Summary

Acute pancreatic necrosis can cause sudden death. Five such cases are described. The aetiology of the condition is briefly discussed.

Attention is drawn to the significance of arterial thrombosis as a factor in the pathogenesis of the disease.

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The need for a home where severely handicapped children can stay for short periods during holidays and family crises has so impressed the Invalid Children's Aid Association that it has turned over its John Horniman Home at Worthing to this purpose. The home, which is in the charge of a married couple with nursing and domestic assistance, can take 24 children (boys 7 to 13 and girls 7 to 15 years, inclusive). Physiotherapy is available at the local hospital. The maximum length of stay is eight weeks, and the fee £5 10s. a week. Children with the following disabilities are considered suitable: spina bifida, poliomyelitis, congenital deformities, haemophilia, muscular dystrophy, cerebral palsy (I.Q. not below 65), fragilitas ossium, congenital or quiescent rheumatic heart disease. Children are not accepted who have been ascertained as mentally defective, or who suffer from epilepsy, pulmonary tuberculosis, or blindness. Application forms for admission and further details may be obtained from Miss Rattenbury, 4, Palace Gate, London, W.8.