moves to the erythrocytes when there is a lagging or an artificial decrease caused by oleate or cholic acid. No attempt has been made to repeat this work, and it has not been possible to obtain access to the original paper; but the need for such a transference would explain the period of storage necessary for bile salts to cause inhibition *in vitro* when present in relatively small amounts. Koster does not state whether Bendien found immediate or delayed inhibition from pure cholic acid.

No attempt has been made to exclude the possibility that the changes in the E.S.R. in infective hepatitis may be entirely due to alterations in the plasma proteins. It has, however, been shown that the low sedimentation rate in the acute phase of those cases of infective hepatitis which show a raised E.S.R. in convalescence is closely related to the icterus, and evidence has been put forward suggesting the possibility that an excess of bile salts in the plasma may be responsible.

Summary

In one-half of a series of 80 cases of infective hepatitis the erythrocyte sedimentation rate was raised at some stage of the disease.

In 6 of 8 cases seen in the pre-icteric phase the E.S.R. was raised above 10 mm. in one hour.

It has been shown that in cases in which the E.S.R. is raised there is a strong negative correlation between the height of the E.S.R. and the serum bilirubin.

Evidence has been produced to suggest that an increase in bile salts might cause an inhibition of the E.S.R. in the acute phase of the disease.

REFERENCES

- Ahlberg, N. (1939). *Acta med. scand.*, **99**, 297.
 Bendien, W. M., Neuberg, J., and Snapper, I. (1932). Quoted by Koster, L. (1937).
 Gordon, C. M., and Wardley, J. R. (1943). *Biochem. J.*, **37**, 393.
 Koster, L. (1937). *Acta med. scand.*, **93**, 420.
 Penman, A. C. (1943). *British Medical Journal*, **2**, 760.
 Ryle, J. A. (1921). *Quart. J. Med.*, **14**, 139.
 Whitby, L. E. H., and Hynes, M. (1938). *Lancet*, **2**, 249.
 Wintrobe, M. M., and Landsberg, J. W. (1935). *Amer. J. med. Sci.*, **189**, 102.
 Wood, P. (1945). *British Medical Journal*, **1**, 9.
 Ziegler, E. (1941). *Ann. Pediatr.*, **157**, 129.

NECROSIS OF THE LIVER AND BILATERAL MASSIVE SUPRARENAL HAEMORRHAGE IN THE PUERPERIUM

BY

GLADYS H. DODDS, M.D., F.R.C.S., F.R.C.O.G.

Assistant, Obstetric Unit, University College Hospital; Part-time Obstetrician and Gynaecologist, L.C.C.

Necrosis of the liver during pregnancy or early in the puerperium is not uncommon. Sheehan (1940) described 14 cases in a series of 400 necropsies in Glasgow Maternity Hospital. Haemorrhages in association with liver damage are well recognized, but bilateral massive suprarenal haemorrhage is a rare condition in adults; when it occurs it is most often associated with meningococcal septicaemia. Only two cases (Keele and Keele, 1942; Hall and Hemken, 1936) in which suprarenal haemorrhage was associated with pregnancy are recorded, and in both the condition was unilateral. A recent bilateral case is described below.

Case Report

A primigravida, 34 years old, 38 weeks pregnant, was admitted to hospital in labour on Nov. 24, 1944, at 1.45 a.m. She had attended a private doctor during her ante-natal period. The pregnancy had been normal until Nov. 10, when the B.P. was 130/85, there was slight oedema of the ankles, and a trace of albumin was present in a non-catheter specimen of urine. She was advised to rest at home and to avoid meat and fish.

On Nov. 23 labour started at 7 p.m. and she was admitted to hospital as no beds were available at the nursing home where she had booked. On admission her general condition was good—B.P. 136/86 mm. Hg, a trace of albumin in the urine, pulse 80; there was oedema of the legs up to the knees. Labour progressed normally, and she was delivered spontaneously, at 7 p.m. on Nov. 24, of a 7½-lb. living male child. In the third stage of labour about 14 oz. of blood was lost and the placenta was expressed from the vagina half an hour after delivery of the baby. The pulse rate at the end of labour was 100. The patient vomited once during the second stage of labour while using self-administered trichlorethylene, and once again about 1½ hours after delivery of the placenta.

On Nov. 25 the B.P. was 110/66, and pulse 80. She complained of frontal headache, vomited several times throughout the day, and appeared tired and sleepy. On Nov. 26 she still appeared very lethargic; pulse 82. The sclerotics were slightly yellow. There was no complaint of abdominal pain, and no tenderness was elicited on palpation of the upper part of the abdomen. She vomited once this day—a small amount of brown fluid. She still complained of headache, which was severe enough to keep her awake. A tentative diagnosis of acute yellow atrophy was made. She was given 1,000 c.cm. of 5% glucose-saline intravenously and 10 c.cm. of 10% calcium gluconate. On Nov. 27, at 10 a.m., the patient was still lethargic, but the jaundice had not deepened; pulse 82 a minute. There was some tenderness in the epigastrium but no rigidity. At 11.30 a.m. she became comatose. Respiration was slow and deep. There was no response to stimulation. At 12.30 p.m. she had a slight shivering attack. Her condition improved and she responded to stimulation and answered questions. At 2.45 p.m. her condition had improved considerably. She was alert and asked for drinks and food.

Blood investigations: Protein, 3.33% (albumin 1.76%, globulin 1.47%, A.-G. ratio 1.2:1, fibrinogen 0.10%); urea nitrogen, 78 mg. per 100 c.cm.; N.P.N., 105 mg. per 100 c.cm.; uric acid, 15 mg. per 100 c.cm.; van den Bergh—direct reaction, biphasic; indirect, 3.5 mg. per 100 c.cm.; cholesterol, 83 mg. per 100 c.cm.; R.B.C., 2,350,000; haemoglobin 43%; W.B.C. 26,900 (polymorphs 34%, lymphocytes 65%). Swabs were taken from nose, throat, and vagina for culture—all were negative. Examination of a catheter specimen of urine revealed a trace of albumin, some leucocytes, scanty hyaline casts, no crystals. A growth of enterococci was obtained on culture.

In the evening of the 27th she appeared more alert than at any time since delivery, but now complained of pain in the epigastrium below the right costal region. There was some tenderness on pressure over this area. On Nov. 28 the jaundice had not increased, but the pulse had risen to 100. She was drowsy, and still complained of pain under the right costal margin. At 3.30 p.m. she suddenly became very breathless, then comatose; the pulse deteriorated and she died at 4.50 p.m. The temperature was normal during her stay in hospital.

Post-mortem Findings.—The liver was normal in size; its surface was smooth. It was uniformly yellow and no lobular pattern could be seen. There were no haemorrhages. Microscopical examination revealed massive necrosis, involving the whole of many adjacent lobules; within these necrotic areas there were a few small clusters of surviving liver cells. The kidneys were normal in size; the capsules stripped off easily. The surface of the kidneys was smooth and pale in colour. Degenerative changes were present in the second convoluted tubules and in the loop of Henle. The suprarenals were enlarged to three or four times their normal size. They were deep purplish red in colour. On cutting into them blood spurted out. Microscopical examination showed extravasation of blood in the parenchyma of the cortex and some small areas of focal necrosis with leucocytic infiltration. The capsule was not involved, and for the most part the outer zone of the cortex was normal. Examination of the remainder of the body revealed nothing abnormal. There was no evidence of sepsis.

Discussion

The course of events in the above case can be presumed to have been liver necrosis first, followed later by suprarenal haemorrhage. Haemorrhages are of common occurrence in association with liver damage. An unusual feature was the occurrence of massive haemorrhage into both suprarenal glands. The haemorrhage probably occurred on Nov. 26, when the patient complained of pain in the epigastrium, and accounts for the coma on the 27th. The tendency to haemorrhage in liver necrosis may be associated with low fibrinogen content of the blood.

The liver lesion did not resemble that occurring in obstetric acute yellow atrophy as described by Sheehan. He records "a gross fatty change affecting the entire lobule except a sharply defined rim of normal cells around the portal tracts. The affected cells are bloated by a fine foam of small fatty vacuoles throughout the cytoplasm, the nuclei are normal, and there is an entire absence of necrobiotic change." Stander and Cadden (1934) believe that the fatty degeneration precedes actual necrosis. Glynn and Himsworth (1944) in their report of experimental work on the production of liver necrosis and fibrosis state that by killing the animals at the appropriate time specimens showing acute yellow atrophy, subacute atrophy, necrosis, and fibrosis can be obtained. The liver lesion in this case resembled the liver lesion of chloroform poisoning described by Sheehan and of massive necrosis due to dietary deficiency described by Glynn and Himsworth.

From a clinical aspect three contributory factors were present: (1) the toxæmia, (2) the low-protein diet, and (3) the use of trichlorethylene.

The toxæmia was slight and could not account for the severe damage found in the liver cells. It may have been the initial lesion.

Low-protein Diet.—The patient was advised to avoid meat and fish for about two weeks before she was admitted to hospital. As she was not under observation during this period the actual diet is not known. Experimentally, Glynn and Himsworth have produced massive necrosis of the liver by feeding rats on a diet deficient in proteins. It is also worth while noting that before the war of 1914-18 massive necrosis of the liver was a rarity in Central Europe (Strümpell, 1921), while during that war and for some years afterwards its incidence increased owing, it was believed, to the general malnutrition. It was commoner among women than men, largely because of the number of cases occurring in pregnancy. The protein requirements of pregnant women are higher than those of the non-pregnant, particularly because of the needs of the foetus in the later weeks of pregnancy. Digestive disturbance, poor appetite, and sometimes faulty absorption all contribute to the development of deficiency and liver destruction.

Against these two aetiological factors many thousands of women with a greater degree of toxæmia have been treated with a more restricted diet for a longer period without such a catastrophe as occurred in this case happening.

With regard to trichlorethylene, the patient had a small quantity of this chlorinated hydrocarbon in the second stage of labour. A Freedman inhaler was used. The amount was not enough to produce unconsciousness. The quantity was not estimated exactly, but it was certainly less than half a drachm. The drug is not very volatile, but it is unlikely that an overdose could have been obtained during inhalation through air. Trichlorethylene has been administered by the closed method to many thousands of cases, and liver damage is not mentioned in these reports (Carden, 1944; Gordon and Shackleton, 1943; Haworth and Duff, 1943; Hewer, 1943; Hunter, 1944). It has been administered through air to a large number of women in labour and, so far, no case of liver damage has been reported (Freedman, 1943; Calvert, 1944). Trichlorethylene is known to produce liver damage much more rarely than chloroform. Liver damage due to trichlorethylene in humans has been reported by Willcox (1931), Roholm (1933), and Vallée and Leclercq (1935), and in animals by Herzberg (1934), Meyer (1929), and Castellino (1932).

REFERENCES

- Calvert, W. (1944). *J. Obstet. Gynaec. Brit. Emp.*, **51**, 140.
Carden, S. (1944). *British Medical Journal*, **1**, 319.
Castellino, N. (1932). Quoted in Med. Res. Cncl. Rep. No. 80, 1937, London.
Freedman, A. (1943). *Lancet*, **2**, 696.
Glynn, L. E., and Himsworth, H. P. (1944). *J. Path. Bact.*, **56**, 297.
Gordon, R. A., and Shackleton, R. P. W. (1943). *British Medical Journal*, **1**, 380.
Hall, E. M., and Hemken, L. (1936). *Arch. Intern. Med.*, **58**, 448.
Haworth, J., and Duff, A. (1943). *British Medical Journal*, **1**, 381.
Herzberg, M. (1934). *Curr. Res. Anaesth.*, **13**, 203.
Hewer, C. L. (1943). *Proc. roy. Soc. Med.*, **36**, 463.
Hunter, A. R. (1944). *Lancet*, **1**, 308.
Keele, D. V., and Keele, K. D. (1942). *British Medical Journal*, **2**, 687.
Meyer, H. (1929). *Klin. Mbl. Augenheilk.*, **82**, 309.
Roholm, K. (1933). Quoted in Med. Res. Cncl. Rep. No. 80, 1937, London.
Sheehan, H. L. (1940). *J. Obstet. Gynaec. Brit. Emp.*, **47**, 49.
Stander, H. J., and Cadden, J. F. (1934). *Amer. J. Obstet. Gynec.*, **28**, 61.
Strümpell, A. (1921). *Dtsch. med. Wschr.*, **47**, 1219.
Vallée, C., and Leclercq, J. (1935). *Ann. Méd. lég.*, **15**, 10.
Willcox, W. (1931). *Lancet*, **2**, **1**, 57, 111.

At a General Court of the Governors of St. Thomas's Hospital held in London on May 23 an interim report on the reconstruction of the hospital was submitted. St. Thomas's received direct hits on different dates by twelve high-explosive bombs, including one flying bomb, and by a number of incendiaries. The chairman of the reconstruction panel, Mr. H. Winterbotham, said that the interim scheme was designed to cover the period between the end of the war in Europe and the final reconstruction of St. Thomas's. It contemplated the provision of 550 beds in London for in-patients, with facilities for an out-patient department comparable to the pre-war accommodation. Service on this basis was thought to be the minimum needed to maintain the educational standard and the standard of treatment at a proper level. Major Patrick Kinnaird, one of the joint treasurers of the hospital, said that the aim was to have ultimately 1,000 beds compared with the previous maximum of 630. The Lord Mayor of London, who was present at the meeting, emphasized the need to make widely known the prospective deficit of between £30,000 and £40,000, which would have to be made good.

MUMPS MENINGO-ENCEPHALITIS AND ORCHITIS

BY

JAMES P. A. HALCROW, M.B., M.R.C.P.Ed., D.P.H.

AND

IAN WANG, M.B., Ch.B.

(Emergency Medical Service, Scotland)

The following case of mumps with meningo-encephalitis and orchitis, which presents some unusual findings, is considered worthy of record. Meningo-encephalitis occurs occasionally as a sequel of mumps, and cases have been described in which meningo-encephalitis either preceded or was the only manifestation of mumps (Howard, 1919; Beddingfield, 1927). Coe (1945) described a case in which meningitis, orchitis, and arthralgia occurred without parotitis. Harris and Bethell (1938) report one case with meningitis and orchitis but no parotitis. They stress the fact that parotitis is only a common complication of mumps and not an essential feature of the disease. Frankland (1941) describes an epidemic of mumps among soldiers in which meningitis was observed without parotitis or orchitis.

Case Report

A soldier aged 26 was admitted to the medical unit of an E.M.S. hospital on March 25, 1944. His illness began on March 23 with a sharp pain in the right lower abdomen, accompanied by pain in the right testicle and slight frontal headache. The abdominal pain was severe enough to keep him awake all night, and by the next morning it had increased further in intensity. At this time his headache was also worse and he complained of giddiness and drowsiness. These symptoms persisted throughout the day, and nausea and mental confusion also appeared. The temperature during the first two days of his illness varied between 103 and 105.2° F. The pulse rate varied between 82 and 90. The personal and family histories were not relevant.

Examination revealed a well-built man who was flushed and mentally confused. Photophobia was present. All tendon and superficial reflexes were exaggerated. The plantar reflexes were extensor. There was a moderate degree of neck rigidity, and Kernig's sign was positive. Ophthalmoscopic examination revealed a moderate degree of bilateral papilloedema. No other abnormalities were observed in the central nervous system. There was slight tenderness in the right lower quadrant of the abdomen and a mild right-sided orchitis was present. There was no lymphadenopathy or splenomegaly. Clinical examination of the heart and lungs was negative, and radiographs of chest and skull revealed no abnormalities. B.P. 115/65.

Laboratory Investigations.—The urine contained a trace of albumin but no sugar. Microscopical examination was negative and culture was sterile. The C.S.F. was clear and contained 9 lymphocytes per c.mm. No excess of globulin was present and the Kahn reaction was negative. Protein, 20 mg. per 100 c.cm.; sugar, 90 mg. per 100 c.cm.; chlorides, 729 mg. per 100 c.cm. Culture was sterile. Culture and animal inoculation for *M. tuberculosis* gave negative results. Blood culture sterile. Widal reaction, negative. Blood Wassermann, Kahn, and gonococcal complement-fixation tests all negative. B.S.R. (Westergren) 20 mm. in first hour. Blood counts showed:

	R.B.C.	Hb	W.B.C.	Neutrophils	Lymphs.	Monos.	Basophils
25/3/44			15,000	84%	11%	5%	—
26/3/44		100%	10,400	78%	14%	7%	1%
3/4/44	6.25 m.	100%	8,600	53%	43%	3%	1%

Progress.—By March 26 the orchitis was more severe, and in view of this and the clinical evidence of meningo-encephalitis, the patient was questioned more closely as to any recent parotid swelling. He then recalled that he had observed slight swelling of the left side of the face and pain on opening his mouth wide three days before the onset of orchitis. The facial swelling and pain had disappeared within 24 hours. Although his orchitis had become more severe, neck rigidity and Kernig's sign were no longer present; he was mentally much clearer, and headache and photophobia were less pronounced. The plantar responses were still extensor, and in the evening of March 26 he developed quick involuntary twitching of the facial muscles. The next day there was great improvement; temperature was normal, and headache and photophobia had disappeared completely. The plantar reflexes were flexor and the papilloedema was clearing. Thereafter he made an uninterrupted recovery, and by April 5 there was no evidence of orchitis and the papilloedema had gone. A further lumbar puncture was done on