TRICHLORETHYLENE POISONING WITH PARANOID PSYCHOSIS AND LILLIPUTIAN HALLUCINATION

BY

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There are few published reports of psychosis resulting from poisoning with trichlorethylene ("trilene"). Eichert (1936) recorded two cases and Rickles (1945) one case. All three arose from the excessive use of trichlorethylene inhalations to assuage the pain of tic douloureux. The opportunity to study the effects of orally ingested trichlorethylene has rarely arisen. However, Stephens (1945), Naish (1945), and Kallenback (1947) have between them described the toxic manifestations of swallowed trichlorethylene in four cases. In general, the symptoms consisted of prolonged inebriation, with vomiting, dizziness, deafness, or numbness of the limbs. The following case has some unique features.

Case Report

An Irish labourer aged 40 was admitted to Littlemore Mental Hospital on April 11, 1953. On April 5 he had accidentally swallowed a quantity of trichlorethylene contained in a beer bottle. The precise quantity ingested could not be ascertained, but was described as a "good swig." Realizing his mistake, he succeeded in vomiting up some of the liquid by swallowing an emetic mixture of salt and water. Nevertheless, his breath reeked of trichlorethylene and he was grossly inebriated on arrival at the casualty department of the Radcliffe Infirmary less than an hour after the accident. Despite stomach washouts (and other treatment), he passed into a deep coma lasting 36 hours. At times he was frankly cyanosed. The pupils varied in size from pin-point to wide dilatation with brisk light reaction. The B.P. varied between 90/50 and 140/70. On April 8, consciousness having returned the previous day, he developed a system of paranoid ideas to the effect that he was going to be "beaten up" during the night by two patients in league with the nursing staff. That night he awoke in a state of delirium which he described as follows:

"The next thing I remembered was awakening to find myself soaked in sweat and strapped in a kind of long leather sack. I could hear the two patients who had spied on me during the day talking with the night nurses. One of them said, 'Let's give it to him now.' I opened my eyes, struggled free from the sack, and shouted for help. I then saw that the ward was its usual length, but only about 2 ft. high; the beds were about 18 in. long. In response to my cries a little nurse, 12 in. high, ran to my bed. I told her I was afraid, so she tried to reassure me, and went away to get a hot drink. While she was away, other nurses came to my bedside and were later followed by a doctor. They were all about 12 in. tall. I recognized all of them as the nurses and doctor I had seen before. The only other person besides myself who seemed the normal size was a patient in the bed next to mine. I thought he was a negro who was also being persecuted, but later found that he was white. I felt terribly afraid while all this was going on. They changed my shirt and gave me an injection. The next morning everything was back to its usual size."

During the next few days he continued to show evidence of a paranoid psychosis. For example, he complained that people were saying he had V.D., and that a nurse had "framed" him with a 10s. note introduced into his locker. His transfer to a mental hospital became necessary as a result of marked restlessness.

He was examined on his arrival at Littlemore Mental Hospital, with the following results. *Psychiatric condition:* During the first 48 hours he was unduly loquacious and

lacking in insight. He still harboured delusions of a persecutory nature. The family and personal psychiatric histories were negative. *Physical condition:* He showed no physical abnormality with the exception of a coarse tremor of his extended fingers and a few persistent sibili at both lung bases. He was discharged in excellent mental and physical condition on April 25.

Special Investigations at Radcliffe Infirmary.—April 5: Hb, 100%; white cells, 20,000 per c.mm.; a neutrophil leucocytosis was present. April 8: Normal plasma proteins. No abnormal constituents of any kind in the urine.

Special Investigations at Littlemore Mental Hospital.—April 15: Blood urea, 30 mg. per 100 ml.; blood bilirubin, 0.2 mg. per 100 ml.; prothrombin level, 100%; plasma proteins, 7.1 g. per 100 ml.; urine testing showed no abnormal constituents. April 16: Hb, 115%; white cells, 10,000 per c.mm. April 20: Blood urea, 27 mg. per 100 ml.; blood bilirubin, 0.3 mg. per 100 ml.; prothrombin level, 100%; plasma proteins, 6.5 g. per 100 ml.; the urine contained no abnormal constituents.

Discussion

A noteworthy feature of this case is the fact that at no time was there any evidence of hepato-renal damage, despite the ingestion of enough trichlorethylene to produce a coma lasting 36 hours. This demonstrates a highly selective action of the substance on the central nervous system. Hunter (1949) showed that trichlorethylene has no serious toxic effect on the kidneys or liver of healthy mice. Ostlere (1953), after reviewing the literature, arrived at the conclusion that "the evidence of animal experiments, industrial toxicology, laboratory tests, and clinical practice clearly indicates that the toxic effects of trichlorethylene on the liver are negligible." The sparing of the liver cells by trichlorethylene is surprising, as the chemically related chloroform, carbon tetrachloride, and tetrachlorethane are notorious hepatotoxins.

The adjective "Lilliputian" was first used by Leroy (1909) to describe a rare form of visual hallucination consisting in the perception of imaginary objects, persons, or animals of diminutive size. These tiny animals or personages are usually seen as brightly coloured mobile creatures strongly reminiscent of those described by Swift in *Gulliver's Travels*. The perception of these colourful midgets tends to produce in the subject an agreeable emotional reaction, whereas the more usual forms of visual hallucination often engender a feeling of terror. The real environment does not usually participate in the Lilliputian contraction. In the case described, the microptic hallucinations took an exceptional (if not unique) form in that they represented real personages, were not coloured, produced a feeling of fear in the patient, and the ward was involved in the Lilliputian effect. In his delirium, the patient would appear to have experienced microptic *illusion* in addition to hallucination. Lilliputian hallucinosis has been described as a result of intoxication from alcohol, chloral, ether, cholera, and typhoid (Leroy and Rogues de Fursac, 1920). It has also been reported in the course of scarlet fever (Hall, 1922) and cocaineism (Henderson and Gillespie, 1927). It is tempting to wonder if Dean Swift (or one of his friends) experienced the phenomenon at some time or another.

Summary

A case of accidental poisoning with trichlorethylene is described. An acute paranoid psychosis with Lilliputian hallucination followed a 36-hours coma. There was no evidence of hepato-renal damage at any time. In this case the microptic hallucination differed in many ways from the classical descriptions in the French literature.

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Infirmiry. I am grateful to the medical and technical staff of Imperial Chemical Industries, who took a great interest in the case and analysed the parent liquid from which the beer-bottle sample was derived.

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Medical Memorandum

Traumatic Retroperitoneal Rupture of Duodenum

In view of the rarity of traumatic retroperitoneal rupture of the duodenum the following case is worthy of record.

CASE REPORT

A window-cleaner aged 17 was admitted on October 16, 1951, at 4.30 p.m. with a history of having fallen from a window-sill, a height of 20 ft. (6 metres), one hour previously. No one had seen him fall and he had been picked up by his workmate a few minutes later. He was quite conscious, but had no memory of falling. He was complaining of severe pain in his abdomen and was bleeding from his nose.

On examination his temperature was 98° F. (36.7° C.), pulse 92, respirations 20, and blood pressure 110/70. He was bleeding from both nostrils and he had a 1-in. (2.5-cm.) laceration of the chin. There was no obvious fracture of the nose or mandible. He complained of severe abdominal pain, mostly in the umbilical and hypogastric regions. He vomited twice during examination, and blood-staining of the vomitus was noticed, but the possibility of blood swallowed from his epistaxis was considered. Abdominal examination revealed abrasions and some bruising in the right iliac fossa. He was very tender, with some guarding over the whole abdomen, especially in the left iliac fossa. There was no rigidity. Bowel sounds were not heard. Dullness was not elicited in the flanks, and rectal examination caused no undue discomfort. A soft rubber catheter was passed to exclude bladder injury. It passed easily and 6 oz. (170 ml.) of clear urine was obtained. A diagnosis of ruptured abdominal viscus was made, and laparotomy was performed by one of us (W.P.C.) two hours after admission.

Operation.—Under thiopentone, cyclopropane, curare, and oxygen anaesthesia the abdomen was opened through a long right paramedian incision. A small quantity of free blood was present in the peritoneal cavity. By palpation no tear was found in either spleen or liver. Further inspection revealed a large left-sided retroperitoneal haematoma behind the descending colon and extending forwards between the layers of the pelvic mesocolon. The haematoma extended upwards and towards the right, and was continuous with a haematoma behind the hepatic flexure and the duodenum. The right kidney felt normal. Blood and extensive bile-staining were present in the lesser omentum. A laceration of the biliary tract was considered. The gall-bladder was normal and contained bile. The lesser omentum was incised and no lesion was seen in the common bile duct. Bile-stained fluid was coming upwards from behind the first part of the duodenum. The peritoneum along the right border of the duodenum was divided and the

duodenum mobilized to the left. A 1-in. (2.5-cm.) linear tear was found on the posterior wall of the first part of the duodenum across the long axis of the bowel. Bile-stained contents were emerging. The tear was closed with two layers of continuous catgut. Examination of the whole bowel revealed no further lesion. Abdominal toilet was performed and the abdomen closed in layers with a stab drain to the duodenum. Extraperitoneal drainage of the left-sided retroperitoneal haematoma was carried out.

After operation 2 pints (1.1 litres) of blood was given by intravenous drip followed by alternating normal saline and 2½% dextrose. Gastric suction was instituted.

His progress was stormy. On the fourth post-operative day the stab drain to the duodenum discharged bile-stained fluid which digested the surrounding skin. Although not analysed, this was doubtless due to associated pancreatic trauma. It cleared up on the ninth day. The abdomen gradually distended and there were signs of paralytic ileus by the sixth post-operative day. Gastric suction and intravenous fluids were continued until the tenth day, when the bowel action returned. The drains were removed on the ninth day and the sutures on the eighteenth day, when the wound was soundly healed and the patient was eating normally.

He reported four weeks after discharge, and was symptom-free and on a full diet. A barium-meal examination on December 7 revealed a slight narrowing of the first part of the duodenum, probably as a result of the operation.

COMMENT

Closed traumatic retroperitoneal rupture of the duodenum is a rare injury. Johnson (1944) collected 52 cases from the literature between 1910 and 1943. The causative force may not necessarily be great, and the diagnosis of intestinal abdominal injury may therefore be delayed until signs of retroperitoneal sepsis or haemorrhage develop. When the parietal peritoneum of the abdomen is torn the signs of developing peritonitis may be the first indication of the diagnosis. In the case here reported the large retroperitoneal haematoma on the left side, associated with the free blood in the peritoneal cavity, no doubt explains the severe lower abdominal pain and tenderness in the left iliac fossa and probably accounted for so early a laparotomy.

The aetiology of retroperitoneal rupture of the duodenum is not clear. Cases of "burst injury" of the duodenum due to sudden compression of gastric contents with "blow out" of the duodenum have been described. This type of injury would be expected to cause a tear in the long axis of the gut. In the above case the tear was across the long axis and was most probably due to a sudden strain at the junction of the fixed and mobile parts of the first part of the duodenum associated with crushing against the vertebral column.

At operation, as pointed out by Simpson (1950), bile-staining of the retroperitoneal tissues should suggest a diagnosis and warrant inspection of this region. Simpson also recommends simple suture if possible, as was performed in this case.

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