THE USE OF AVERTIN IN THE PRESENCE OF DAMAGED LIVER FUNCTION

WITH REPORT OF THREE ILLUSTRATIVE CASES

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A study of the literature reveals the fact that there are two conflicting views as to the deleterious effect of avertin on the liver. In his Lumleian Lecture on toxic jaundice delivered in June, 1931,¹ Sir W. Willcox uttered a warning, based on theoretical pharmacological grounds, as to the possibility of liver damage by the use of avertin, and cited experimental work by Parsons on rabbits. Parsons² himself is of the opinion that avertin is harmful to the liver, and has demonstrated slight fatty degeneration in rabbits after doses of 0.5 gram per kilo body weight.

These statements have been persistently challenged by Sir Francis Shipway,³ who bases his opposition on his extensive clinical experience with avertin, and in America, where the trend of experimental and clinical experience during the last two years has been towards freeing avertin from an undeserved stigma of toxicity. Thus Bourne, Bruger, and Dreyer,⁴ after experimental and clinical observation on dogs and human beings, conclude that, relatively to chloroform or ether, the harm done by sodium amytal or avertin to the liver would seem to be negligible. As a result of their experiments on dogs Raginsky and Bourne⁵ have arrived at the following conclusions: (1) avertin has by no means the same damaging effect on liver as chloroform; (2) avertin can probably be used quite safely in individuals with moderate liver damage, although it is advisable to use smaller doses than usual to produce the desired effect.

Anaesthetists may have hesitated, owing to these conflicting views, to use avertin in cases of certain or suspected pre-operative liver damage, and the following cases are recorded in which avertin was used in the pre-operative presence of known or suspected liver damage, with no apparent harmful effects.

CASE I

Mrs. W., aged 55, had a typical history of severe recurrent attacks of cholecystitis since June, 1931. She was first seen on December 2nd, 1931, a fortnight after the onset of an attack. She had vomited everything taken during the previous five or six days, and the bowels had not been opened for three days. Her temperature was 100° F., and her pulse 108; she was slightly jaundiced, and looked very ill. After a few days of pre-operative treatment she was operated upon on December 11th.

Avertin 0.1 gram per kilo body weight in a 3 per cent. solution in distilled water was administered, ten minutes being occupied in the administration. Ten minutes later the patient was quite unconscious, and was brought to the operating theatre. Nitrous oxide and oxygen were then administered through an ordinary face-piece, and the operation of cholecystectomy performed. Muscular relaxation was good, and no ether was necessary at any time throughout the operation. The appearance of the liver was markedly cirrhotic. Recovery from the anaesthetic and subsequent convalescence were uneventful, except for some slight vomiting on the evening of the operation.

CASE II

Miss G., aged 55, had a history of recurrent attacks of abdominal pain, accompanied by flatulence and vomiting, since 1929. She had lost weight, and her appetite was poor. She was first seen on January 29th, 1932. There was marked tenderness in the right hypochondrium, and it was thought that the gall-bladder was just palpable. She was faintly jaundiced, and the urine contained bile. During the next few days the jaundice increased greatly in depth, but

the patient insisted on immediate operation to obtain relief from her symptoms.

On February 5th, at 10.10 a.m., avertin 0.1 gram per kilo body weight was administered in a 3 per cent. solution in distilled water. At 10.30 the patient was quite unconscious. Nitrous oxide and oxygen were then administered through an ordinary face-piece, and the operation of cholecystectomy and choledochotomy and drainage performed. The operation and the anaesthetic were both difficult, a large amount of ether being required to obtain adequate access, and in addition some chloroform was necessary to facilitate the peritoneal closure. By 2.30 p.m. the patient was very restless, and 1/6 grain of morphine was administered. For the first forty-eight hours nausea was very marked, accompanied occasionally by slight bilious vomiting. The subsequent progress of the patient was slow but steady; in particular, her jaundice was slow in disappearing, although she felt greatly benefited by the operation. She returned home on February 29th. A faint tinge of jaundice was still visible in the conjunctivae, but the stools were normal and the urine was free from bile. The patient herself said that she was "feeling well and eating well."

CASE III

Mrs. H., aged 57, had had recurrent attacks of pain in the right hypochondrium, accompanied by vomiting and constipation, since December, 1931. She was first seen on February 3rd, 1932. There was tenderness in the right hypochondrium, and it was thought that an indefinite mass was present on deep palpation in that area. Slight jaundice was present, which had been first noticed during the last week in January. For a few days after she was first seen the jaundice increased markedly; the patient was deeply jaundiced on the day of operation (February 9th).

At 9.40 a.m. avertin 0.1 gram per kilo body weight was administered in a 3 per cent. solution in distilled water. At 10 o'clock the patient was unconscious. An intratracheal catheter was introduced by direct vision, and nitrous oxide and oxygen were administered. An exploratory laparotomy was then performed, which revealed a large carcinoma of the head of the pancreas, and the liver studded with secondary deposits. Owing to the advanced state of the disease it was impossible to undertake any operative treatment, and the abdomen was closed. A small amount of ether was administered to facilitate the peritoneal suture. This patient had no post-operative vomiting, and returned home on February 23rd, her general condition being unaltered by the operation. During the few days preceding her return home the jaundice became increasingly deeper.

It will be noticed that two of the patients were deeply jaundiced before operation, that each received a normal dose of avertin of 0.1 gram per kilo of body weight, and that induction of, depth of, and recovery from, narcosis were all within such normal limits as to occasion no remark.

CONCLUSIONS

1. Conflicting views exist on the possibility of production of liver damage by administration of avertin. The weight of evidence suggests that such damage is slight or negligible.

2. The three cases described prove that avertin can be used without apparent harm in cases in which there is pre-operative liver damage, and also afford strong presumptive evidence that Bourne, Bruger, and Dreyer are correct in their conclusion that avertin is less damaging to the liver than chloroform and ether.

3. Avertin plus nitrous oxide and oxygen, with minimal ether if necessary, is a very suitable anaesthetic for gall-bladder surgery, even in the presence of liver damage.

My thanks are due to Mr. A. H. Southam, honorary assistant surgeon to Manchester Royal Infirmary, for his permission to publish the details of these three cases, all of which were operated upon by him, and for his kindness in supplying his private notes on the pre-operative history and condition.

REFERENCES

- ¹ *Lancet*, 1931, ii, 60.
- ² *Ibid.*, 1931, i, 1239.
- ³ *Ibid.*
- ⁴ *Anaesthesia and Analgesia*, 1931, March-April, 85.
- ⁵ *Ibid.*, 1932, January-February.