

Preliminary Communications

Peritoneal Lavage in Peritonitis: A Preliminary Evaluation

Brit. med. J., 1968, 2, 219

Despite advances in therapy based on increasing understanding of the attendant haemodynamic and metabolic derangements, together with the use of antibiotics, diffuse peritonitis remains a life-endangering condition. The mortality rate of diffuse faecal and biliary peritonitis is still about 50% (Dawson, 1964; Means, 1964). Some surgeons believe in cleansing the peritoneal cavity at operation with antibiotic-containing solutions, but the value of this is uncertain and still controversial. Yet experience with the successful management of peritonitis complicating peritoneal dialysis by continuance of peritoneal lavage with the addition of antibiotics suggests that efficient continuous lavage might prove a valuable additional therapeutic technique in generalized peritonitis.

This paper reports a controlled evaluation of continuous peritoneal lavage in rats with faecal and biliary peritonitis.

METHODS

Experiments were carried out in Hooded-Lister rats weighing 200–300 g. Animals were divided into four groups of 20. Faecal peritonitis was induced by the intraperitoneal injection of 5 ml. of faecal suspension (10 g. fresh rat faeces, emulsified and homogenized in 20 ml. distilled water). The animals in group A (control) were treated with 1.25 mg. tetracycline hydrochloride (Achromycin) twice daily and 10 ml. Ringer-lactate solution subcutaneously daily until death.

The animals in group B (test) were treated with peritoneal lavage, which was started immediately. A catheter (Angiocath 1961, with additional side openings) was placed in the peritoneal cavity under light ether anaesthesia and secured to the abdominal wall with a silk stitch. The peritoneal lavage fluid consisted of a warmed isotonic electrolyte solution containing 1.36% dextrose ("Dialaflex" No. 61, Allen and Hanburys), to every litre of which were added 300 mg. potassium chloride, 125 mg. tetracycline hydrochloride, and 5 ml. 2% procaine hydrochloride. Twenty millilitres of this solution was injected intraperitoneally through the cannula and immediately allowed to drain. After drainage for 15 minutes a further 20 ml. was injected, and this treatment was continued for eight hours on the first and on the second days after peritoneal contamination. These animals were also given 10 ml. Ringer-lactate solution subcutaneously daily for two days.

Biliary peritonitis was induced by the intraperitoneal injection of bile collected from other rats through a glass cannula inserted into the duodenum (Caridis *et al.*, 1968). The control animals (group C) were given an intraperitoneal injection of 5 ml. of rat bile and were treated in a similar way to group A. The test animals (group D) were given an intraperitoneal injection of the same bile, and peritoneal lavage was carried out as in faecal peritonitis, but the treatment was given for eight hours during the first day only. Both groups C and D received 10 ml. of Ringer-lactate solution subcutaneously daily.

Bacteriological swabs were taken from all faecal suspensions and bile collections. Food and water were freely available to all the animals.

RESULTS

The Table shows that all the animals in group A died within the first 24 hours. Of the 20 animals in group B 6 died within the first 48 hours—a mortality rate of 30%. The remaining 14 were alive and well one month after the experiment. All the control animals with biliary peritonitis (group C) died within the first 24 hours, whereas when the biliary peritonitis was treated with continuous peritoneal lavage (group D) the mortality rate fell to 25%. Of the 20 animals 15 were alive one month later.

Group	No. of Animals	Causes of Peritonitis	Treatment	Mortality Rate (%)
A	20	Faecal	Systemic antibiotic	100
B	20	Faecal	Peritoneal lavage	30
C	20	Bile	Systemic antibiotic	100
D	20	Bile	Peritoneal lavage	25

The predominant organisms in the faecal suspensions were *Escherichia coli* and *Streptococcus faecalis*, whereas the bile was infected with *E. coli*. The organisms were usually sensitive to tetracycline.

DISCUSSION

Although at the beginning of this century the abdominal cavity was sometimes washed out with hot and sterile salt solution during operations for perforated large bowel, the technique later fell into disrepute (Moynihan, 1926). Recently, however, limited peritoneal irrigation with antibiotic-containing solutions has been successful in isolated instances in desperately ill patients (Burnett, 1961; Case, 1964; Linklater, 1966). In addition, some surgeons still believe in washing out the peritoneal cavity at operation. The results of our preliminary experiments support this practice and suggest that continuous lavage may be of value in the treatment of diffuse peritonitis.

SUMMARY

Preliminary experiments showed that continuous peritoneal lavage in rats with faecal and biliary peritonitis diminishes the mortality rate by 70% in comparison with systemic antibiotics and parenteral fluid alone.

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