

# BACTERIAL PERITONITIS IN PERITONEAL DIALYSIS

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## SUMMARY

38 episodes of peritonitis in 28 patients were recorded among 97 patients undergoing a total of 159 peritoneal dialysis at the Nephrology Unit, General Hospital, Kuala Lumpur between November 1979 to June 1980. Of these only 14 episodes were associated with a positive bacterial culture. Organism of the *Moraxella-Acinetobacter* group were responsible in 8 episodes. There were 16 positive cultures in patients who had no clinical evidence of peritonitis. The interpretation of bacterial peritonitis in patients undergoing peritoneal dialysis must be made on the basis of clinical findings and bacteriological reports.

## INTRODUCTION

One of the most important complications of peritoneal dialysis is bacterial peritonitis (Maher and Schreiner, 1965). The incidence of bacterial peritonitis in patients undergoing peritoneal dialysis varies from centre to centre as reported by Miller and Tassistro (1969), Maher and Schreiner (1965) and Day and White (1977). The purpose of this study is to establish the incidence of bacterial peritonitis in patients undergoing peritoneal dialysis in the Nephrology Unit, General Hospital, Kuala Lumpur.

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## MATERIAL AND METHODS

A total 97 patients undergoing peritoneal dialysis at the Nephrology Unit, General Hospital, Kuala Lumpur were studied prospectively from November 1979 to June 1980.

There were 72 males (74.2 percent) and 25 females (25.8 percent). Their ages ranged from 2 years to 84 years. There were 46 Chinese (47.4 percent), 37 Malays (38.1 percent) and 14 Indians (14.5 percent). Except for 4 patients who were on intermittent dialysis via a permanent indwelling Tenckhoff catheter, the rest were dialysed after the introduction of a disposable nylon catheter through the abdominal wall using the method described by Maxwell *et al* (1959). One litre cycles were employed. Most dialysis were stopped after 36 to 48 hours unless clinical peritonitis supervened and necessitated treatment with intraperitoneal antibiotics.

TABLE I  
 REASONS FOR PERITONEAL DIALYSIS IN 97  
 PATIENTS SEEN AT THE NEPHROLOGY UNIT,  
 GENERAL HOSPITAL, KUALA LUMPUR,  
 NOVEMBER 1979 TO JUNE 1980.

Reasons for peritoneal dialysis	Number of patients
Chronic renal failure	66 (68%)
Acute renal failure	12 (12%)
Obstructive uropathy	17 (18%)
Methyl alcohol poisoning	2 ( 2%)
Total	97 (100%)

The reasons for peritoneal dialysis in 97 patients seen at the Nephrology Unit, General Hospital, Kuala Lumpur are summarised in Table I.

Except for 2 patients with methyl alcohol poisoning

the rest were severely uraemic with serum creatinine ranging from 1200um/L to 3500um/L. A total of 159 peritoneal dialysis were performed on the 97 patients.

Dialysate fluid from each patient was collected during every peritoneal dialysis. Specimens were collected by trained nurses using aseptic techniques. Sterile syringes were inserted into the outflow dialysis tubing which had been wiped clean with alcohol. Between 15 to 20 ml of dialysate was placed in a sterile Universal bottle and sent immediately to the bacteriology laboratory. Each specimen was first examined macroscopically for turbidity. The specimen was then centrifuged at 2,500 rpm for 10 minutes and the deposit plated on two blood agar plates, a MacConkey plate and a chocolate agar plate. All plates were incubated at 37 C; one blood plate incubated anaerobically and the chocolate plate in a candle jar. The plates were examined after 24 hours and negative plates returned to the incubator for a further 24 hours incubation. All isolates were identified using conventional methods including biochemical tests.

## RESULTS

Clinical peritonitis in this study is defined as the triad of fever, abdominal pain and tenderness and a turbid dialysate. A total of 38 episodes of clinical peritonitis in 28 patients were recorded. The number of episodes per patient varied from 1 to 3. Of the 38 episodes of clinical peritonitis, positive bacterial cultures were obtained in 14 (36.8%). The results of the bacteriological cultures are presented in Table II.

TABLE II  
ORGANISM RESPONSIBLE FOR 38 EPISODES OF PERITONITIS IN 28 PATIENTS UNDERGOING PERITONEAL DIALYSIS

Organism isolated	Number
<i>Moraxella-Acinetobacter</i> group	8
<i>Klebsiella</i> sp	2
<i>E. coli</i>	2
<i>Staphylococcus aureus</i>	2
Sterile	24
Total	38

In addition 16 positive cultures were obtained from patients who had no evidence of peritonitis.

## DISCUSSION

Peritonitis, a common complication of peritoneal dialysis occurs in 10 percent to 25 percent of patients undergoing peritoneal dialysis (Mukherjee, 1969; Miller and Tassistro, 1969; Barry and Schwartz, 1964). In this series 38 episodes of clinical peritonitis were recorded in 28 patients among the 97 patients who underwent a total of 159 peritoneal dialysis. This gives an incidence of 23.9 episodes of peritonitis per 100 peritoneal dialysis. However only 14 episodes (8.8 percent) were proven to be bacterial peritonitis by culture. The high incidence of "sterile" peritonitis may be due to the following reasons: (i) Peritonitis may be caused by agents other than bacteria such as viruses and chemicals (ii) A low count in the effluent dialysate may result in a negative culture as suggested by Gokal *et al* (1980). Perhaps the collection of 100ml of dialysate may be more appropriate. (iii) Bacterial growth may have been suppressed by antibiotics used for extraperitoneal infections which commonly occur in uraemic patients.

There were 16 positive bacterial cultures from patients with no evidence of peritonitis clinically. This is of doubtful significance and probably represents contamination from the environment as the dialysis were performed in open wards. Manual changing of the dialysate solutions may have further contributed to this source of error. However bacterial peritonitis without clinical symptoms and signs have been reported by Boen (1964) and Vidt *et al* (1970).

Of the 14 episodes of peritonitis with positive bacterial cultures, 8 were caused by organisms of the *Moraxella-Acinetobacter* group of bacteria. These are aerobic, non-fermentative, Gram negative bacilli and they occur widely in the environment. An outbreak of *Acinetobacter* associated with peritoneal dialysis was reported by Abrutyn *et al* (1978). This illustrates the importance of environmental reservoirs in infection complicating peritoneal dialysis.

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