



CLINICAL STUDY OF PERITONITIS COMPLICATED BY ACUTE RENAL FAILURE

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ABSTRACT Peritonitis is quite a common entity presenting as surgical emergency. Often this condition is complicated by acute renal failure. Preoperative diagnosis of secondary peritonitis can be made based on the combination of history, physical examination, laboratory findings and imaging techniques. Often this condition is complicated by acute renal failure. The study group involved 100 patients who were clinically diagnosed with peritonitis and were admitted for treatment in the department of general surgery, Osmania general hospital, Hyderabad, Telangana state from September 2014 to July 2016. This work has been undertaken to study the clinical features of peritonitis complicated by acute renal failure. The results of the study were compared with national and international studies.

KEYWORDS : Peritonitis, Acute Renal Failure ARF, Creatinine, Haemodialysis

INTRODUCTION

Peritonitis is quite a common entity presenting as surgical emergency [1]. Often this condition is complicated by acute renal failure. This work has been undertaken to study the clinical features of peritonitis complicated by acute renal failure. An attempt has been made to identify the patients at risk for acute renal failure by observing certain clinical parameters. Acute renal failure in peritonitis is associated with high mortality as multiple etiological factors are involved such as sequestration of fluid in peritoneal cavity, septicemia, loss of fluid in vomitings (due to paralytic ileus) [2]. By identifying the patients at risk for acute renal failure, preventive measures to halt progression of renal insult can be taken early. It is an axiom that in all cases of peritonitis some degree of hypovolemia is present. This owing to "third spacing" of extra cellular fluid within the peritoneal cavity which can sometimes be intense. Effectiveness of fluid replacement can be gauged by normalization of pulse rate, blood pressure and mental status. Diminished urine flow is result of the effects of increased aldosterone and antidiuretic hormone secretion, the decreased cardiac output and intra renal shunting of blood. This is the setting that has been dubbed hyperdynamic of warm shock characterized by tachycardia, fever, oliguria, hypotension and warm extremities.

Acute and usually reversible deterioration of renal function is sufficient to cause retention of nitrogenous waste which developed over a period of days usually 7 days to cause Acute Renal Failure. Renal replacement therapy, such as with haemodialysis, may be instituted in some cases of AKI. Renal replacement therapy can be applied intermittently (IRRT) and continuously (CRRT). Study results regarding differences in outcomes between IRRT and CRRT are inconsistent. A systematic review of the literature in 2008 demonstrated no difference in outcomes between the use of intermittent hemodialysis and continuous venovenous hemofiltration (CVVH) (a type of continuous hemodialysis). Among critically ill patients, intensive renal replacement therapy with CVVH does not appear to improve outcomes compared to less intensive intermittent hemodialysis. However, other studies demonstrated that compared with IRRT, initiation of CRRT is associated with a lower likelihood of chronic dialysis.

Metabolic acidosis, hyperkalemia, and pulmonary edema may require medical treatment with sodium bicarbonate, antihyperkalemic measures, and diuretic. Lack of improvement with fluid resuscitation, therapy-resistant hyperkalemia, metabolic acidosis, or fluid overload may necessitate artificial support in the form of hemodialysis or hemofiltration.

PATIENTS AND METHODS

The study group involved 100 patients who were clinically diagnosed with peritonitis and were admitted for treatment in the department of general surgery, Osmania general hospital, Hyderabad, Telangana state from September 2014 to July 2016 after taking informed consent. The patients were evaluated by history and physical examination.

Blood samples were sent for serum creatinine and electrolyte estimation immediately after admission. All patients with serum creatinine levels more than 1.5 mg% were taken to have baseline renal failure

INCLUSION CRITERIA:

All cases of peritonitis presenting to emergency surgical department of Osmania General Hospital.

EXCLUSION CRITERIA

Patients who did not give consent for surgery. Patient with severe cardiac co morbidities were excluded in the study. This is a prospective observational study. All the admitted patients underwent following routine surgical profile prior to surgery Complete Blood Picture (CBP) Random Blood Sugar (RBS) Serum Creatinine Serum Electrolytes Blood Grouping and Typing (BGT) Chest X ray. ECG 2D echocardiography for patients with known significant cardiac history as advised by anesthetist. Exploratory laparotomy was done in 94 cases. In 6 cases, bilateral drain only could be inserted due to poor general condition of the patient. The operative findings were recorded and the amount and character of peritoneal collection was noted. Post-operative serial evaluation of serum creatinine and electrolytes was done and need for hemodialysis noted and recorded.

OBSERVATIONS AND RESULTS

The study included 100 patients diagnosed with peritonitis among which 24 patients were diagnosed with acute renal failure. The incidence of acute renal failure in cases of peritonitis in our study was thus calculated as 24%.

Age distribution of cases of peritonitis without renal failure is as follows.

TABLE – 1
AGE DISTRIBUTATION OF PERITONITIS WITHOUT ARF

AGE	CASES
10-19	5
20-29	18
30-39	26
40-49	16
50-59	5
60-69	4
70-79	2
TOTAL	76

Age distribution of patients of peritonitis with renal failure is as follows.

TABLE – 2
AGE DISTRIBUTION OF PERITONITIS WITH ARF

AGE	CASES
20-29	6
30-39	4
40-49	0
50-59	2
60-69	8
70-79	4
TOTAL	24

The total number of male patients in the study was 72 and female 28.

The sex wise distribution of 76 cases of peritonitis

TABLE – 3

SEX DISTRIBUTION OF PERITONITIS WITHOUT ARF

SEX	PATIENTS
MALE	54
FEMALE	22
TOTAL	76

The sex wise distribution of 24 cases of peritonitis with renal failure is as follows as follows

TABLE – 4

SEX DISTRIBUTION OF PERITONITIS WITH ARF

SEX	PATIENTS
MALE	18
FEMALE	6
TOTAL	24

The distribution of cases of peritonitis is as follows

TABLE – 5

DISTRIBUTION OF CASES OF PERTIONITIS

DuodenalUlcer perforation	70
Ileal perforation	8
PerforatedAppendix	5
Liver Abscess Rupture	3
Colonic Perforation	2
Gall Bladder Perforation	1
Small Bowel Perforation	3
Primary Peritonitis	2
Un diagnosed etiology where laparotomy could not be done due to poor general condition of the patients	6
Total	100

The distribution of cases which were complicated by renal failure is as follows

DISTIBUTION OF CASES COMPLICATED BY ARF

TABLE – 6

Duodenalulcer perforation	10
Undiagnosed etiology	6
Primary peritonitis	2
Colonic Perforation	2
Ileal perforation	2
Total	24

The duration of symptoms before the patients of peritonitis with renal failure were brought ranged from 1-15 days. The mean duration was 4.9 days. Average duration of symptoms in patients of peritonitis without renal failure was 1.9 days.

The corresponding urine output at the time of raised Serum Creatinine of 24 patients with peritonitis with renal failure was as follows:

TABLE – 7

URINE OUTPUT IN CASES OF PERITONITIS WITH ARF

Urine output	Patients
<400ml/day Oliguria	10
>400ml/day	14

A total of 18 patients (18%) died among cases with peritonitis. Out of

18 patients, 10 patients had developed acute renal failure. Hence, the mortality rate in this study in patients with peritonitis complicated with ARF is 41.66%.

DISCUSSION

Mortality of patients developing ARF due to severe sepsis still is high in spite of early initiation of dialysis and the development of continuous renal replacement therapies. The death in these patients is not only due to renal failure but also to sequential failure of other organs, leading to the multiple organ dysfunction syndrome caused by a systemic inflammatory response. Some of the important conclusions of this study are Secondary bacterial peritonitis generally responds to resuscitation, appropriate systemic antibiotics, and prompt surgical intervention. However, recurrent intra abdominal infection, complex wound management, and organ failure continue to be challenging clinical problems.

Dellinger et al have shown that disease acuity, as measured by the Acute Physiology Score, and not anatomic site of infection has correlated with mortality in patients with peritonitis. Fry et al[3]Norton[4], and Eiseman et al. reported that the most common cause of multisystem organ failure (MSOF) was intra-abdominal sepsis. Remote organ failure alone without localizing signs to the abdomen is rarely an indication for operative intervention now but had been a reliable sign of occult intra-abdominal infection in the past.

Most of the patients belonged to the middle age group in our study 30 patients in the 30-39 age groups and 16 in 40-49 age groups. However the maximum number of patients with renal failure were in 60-69 (8 patients) indicating that old age related co-morbidities may be a causative factor in increase in incidence in these patients. The mean age in this study was 41.6 years. In the study conducted by Doklestic et al[5], the mean age was 63.7 years. The mean age in studies conducted by Mahmoud et al[6] and Ramchandra et al[7] was 18 years and 36 years respectively.

Most of the patients in our study were males (72%). This was similar to the study conducted by Mahmoud et al (69%) and Ramchandra et al (90%). The study conducted by Doklestic et al, however, had more number of females (54.41%)

The incidence of renal failure in cases of peritonitis in our series is 24% (24 cases out of 100). Eighteen cases had renal failure at admission. Six cases developed renal failure post operatively. Though oliguria is a frequent accompaniment in ARF, only 41.6% of patients with renal failure had oliguria in this series. Out of ten patients with peritonitis with oliguria renal failure, six patients died. Intermittent haemodialysis was undertaken post operatively in four cases of peritonitis with renal failure which did not recover with conservative management. With haemodialysis, serum creatinine returned to normal levels with no further requirement for dialysis support.

In the study conducted by Mahmoud et al, the incidence of renal failure was 4% (2 cases out of 50). The increased incidence of renal failure in our study can be largely attributed to the late presentation of patients to the emergency department. Also, the majority of patients in the study by Mahmoud et al were of appendicular perforation thus suggesting that patients with appendicular perforation are less likely to develop renal failure when compared to patients with duodenal ulcer perforation. In our study, no patient with appendicular perforation developed renal failure.

In our study, the total mortality was 18%. A total number of ten cases out of twenty four cases of peritonitis with renal failure died. Mortality rate among patients with renal failure was 41.6%. 58% of cases of peritonitis recovered from renal failure which correlates roughly with a recovery rate of 79.3% in patients with peritonitis with renal failure reported by Madiev MK, Orlov SN in 1990.

There are studies that show better outcome for patients with secondary peritonitis such as the study reported by Mosdell et al[8], where the mortality rate for all 480 patients was 6% which is reflected to the high number of appendicular perforation (58%) in the study. In the study by Mahmoud et a, the overall mortality rate was 4.4% which is very low compared with the other studies. This may be attributed to the high appendicitis in our country, thereby the high percent of perforated

appendix as origin of secondary peritonitis. In the study by Ramchandra et al the mortality rate was recorded as 14%. Doklestic et al recorded a mortality rate of 8.82% and claimed MODS as the most common cause of death.

CONCLUSIONS

1. The most frequent cause of secondary peritonitis encountered in this study was duodenal ulcer perforations, which was observed in 70% of cases.
2. The highest incidence of secondary peritonitis (30%) was observed in the age group 30 to 39 years, followed by 20 to 29 years (24%). The highest incidence of secondary peritonitis with acute renal failure was observed in the age group 60 to 69 years (8 patients).
3. Males were predominantly affected, with a male to female ratio of 18:7. The male to female ratio in patients who developed ARF was 3:1.
4. The incidence of renal failure in this series is 9.4%. Mortality rate for cases with peritonitis with renal failure is 41.6%.
5. Only 41.6% of patients with renal failure presented with Oliguria. But 60% of patients with oliguria renal failure died indicating bad prognosis for renal failure associated with oliguria.
6. With adequate fluid resuscitation and maintenance of fluid balance, patients of peritonitis with renal failure but otherwise in good general condition recovered.
7. Patients who underwent haemodialysis recovered completely. Peritoneal dialysis was not undertaken in any of the patients since all the cases were of peritonitis.
8. This study showed results that were comparable to previous studies, confirming that our population of patients was representative.
9. Presentation of patients immediately after the first symptom and timely surgical intervention are the keys to successful battle against secondary peritonitis.
10. The most important factor clearly deciding the fate of the patient is eliminating the source of infection. The incidence of secondary peritonitis can be tackled efficiently by better use of guidelines, by patients, appropriate use of prophylactic antibiotics and timely interventions of surgeons.

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