

DISCUSSION:

Acute mesenteric ischaemia comprises a group of pathophysiologic processes that have a common end-point – bowel necrosis. The survival rate has not improved substantially during the past 30 years, and the major reason is the continued difficulty in recognizing the condition before bowel infarction occurs⁽²²⁾. Diagnosis before intestinal infarction is the single most important factor to improve survival⁽²⁾. In short term, it is easier to approach the problem by analysis of the admission criteria of patients with occlusive mesenteric ischaemia in a retrospective manner, that is to identify the suitable diagnostic modality associated with highest accuracy rate and lowest failure rate.

First, considering the incidence of the disease in our locality, this report makes several important observations: The mean age of our patients was 58.7 years which is approximately 10 years younger than previously reported^(14,7 and 1). About one quarter of these patients (22 %) had mesenteric venous thrombosis, a rate higher than expected when compared with other studies^(23,24). Although it was thought to be idiopathic however the possible explanation is that, bilharziasis is an endemic disease in this area with subsequent liver affection and portal hypertension. Arterial thrombo-embolic events affected patients over a wide age range whereas patients with venous thrombosis were predominantly younger than 50 years. Moreover, 68.4 % of our patients were male showing significant predominance in men which is opposite to what reported in other studies in which the disease was more common in women^(11,7).

Second, in an attempt to define patients at high risk of occlusive

mesenteric ischaemia, most studies agreed that cardiac disease was the most common cause of the disease, and hypertension, chronic obstructive lung disease and diabetes were the most important medical problems that affecting the incidence^(10,8). In our study, atrial fibrillation was the most common cardiac disease (60 %) and hypertension was the most remarkable medical problem (50 %) affecting the incidence in patients with thrombo-embolic events. Moreover, smoking affected the incidence in both arterial and venous occlusion (40 % and 57.1% respectively).

Most studies support the concept that clinical presentation is non specific in most cases and can be characterized by an initial discrepancy between severe abdominal pain and minimal clinical findings^(22,1). Physical examination does not reliably differentiate between ischaemic and infarcted bowel⁽²⁵⁾. However, because of non-specific nature of the disease during the early phase, diagnosis is often delayed⁽¹⁾. This led to *Mozzafar et al*⁽⁸⁾ to state that "the mortality rate for patients with occlusive intestinal ischaemia will probably always remain high".

In our study, abdominal pain of abrupt onset in arterial occlusion and insidious onset in venous occlusion was the most common symptom in all patients (100 %). Tachycardia is common in those patients and most of them had marked leucocytosis in arterial occlusive ischaemia (average $23.2 \pm 1.8 \times 10^3/\text{ml}$) and moderate leucocytosis in venous occlusion (average $15.6 \pm 2.7 \times 10^3/\text{ml}$). Blood urea nitrogen and creatinine were markedly elevated in patients with arterial occlusion in comparison to patients with venous occlusion ($36.4 \pm$

4.0 and 2.1 ± 0.4 versus 19.1 ± 3.5 and 1.3 ± 0.3 respectively, $P < 0.05$). This analysis showed that pre-renal azotemia is a common complication of arterial occlusive ischaemia and ascertains importance of adequate resuscitation. Only 28 % of patients had adequate output (> 30 cc per hour) which had significant relation to mortality rate ($P = 0.04$). This result agreed with that reported by *Mozaffar et al*⁽⁸⁾ and added that, in occlusive arterial ischaemia, patients with normal urinary output have more chance to survive when compared to those with less urinary output volume.

In our study, 32 % of patients with occlusive arterial ischaemia were in shock state and it had significant relation to mortality. The same results had reached by *Acosta et al*⁽¹⁾. The mean pH level showed acidosis in both arterial and venous occlusion and evidence of intravascular depletion with admission haematocrite value on average of 36.2 ± 1.7 and 40.6 ± 2.7 in arterial and venous occlusive ischaemia respectively. These data were roughly in accordance with that reported by *Endean et al*⁽¹⁰⁾.

One of the most important factors relative to successful outcome is early diagnosis⁽²²⁾. A high percentage of patients gave a history of peptic ulcer disease, seen especially in patients with arterial occlusion. This finding was partially responsible for a diagnostic confusion and thereby a diagnostic delay. About 64 % of patients with arterial occlusive ischaemia presented with features of frank peritonitis. In this category patients who died differed from survivors only with respect to time of presentation and intervention. Among patients underlying early operation within 12 hours of presentation ($n = 8$) there was 3 deaths (37.4 %) in comparison to 12 deaths (12/17, 70 %)

recorded in patients with delayed presentation and operation (> 24 hours) ($P = 0.02$).

Most studies agreed that plain X - ray had no specific finding in patients with acute intestinal ischaemia^(12,8). However, some authors advocated an early sensitive imaging modalities e.g. CT scan of the abdomen with contrast in diagnosis of venous occlusion⁽²⁶⁾ and arteriography in arterial occlusion⁽²⁷⁾. In our study, plain abdominal X - rays were performed in 12 patients (48 %) with arterial occlusive ischaemia and in all patients (100 %) with venous occlusion and the findings were either non specific or misinterpreted in both categories. CT scan of the abdomen was performed in 2 patients with venous occlusion and showed that the lumen of the thrombosed vein does not enhance in comparison to the surrounding structures. Other CT findings included bowel dilatation and wall-thickening. Correct diagnosis was suspected in these two patients.

Patients with arterial occlusive ischaemia should undergo emergency surgery to revascularize ischaemic bowel and resect infarcted bowel⁽¹⁰⁾. Revascularization can be accomplished by extraction of thrombus or embolus and/or bypass of the occlusive lesion. After revascularization, a conservative approach to bowel resection is warranted to preserve as much intestine as possible. In all patients, bowel that is not infarcted but of questionable viability should not be resected; in these cases, a second-look laparotomy is indicated⁽²⁸⁾. In our study, bowel viability was assessed by visual inspection (color, peristaltic activity). Bowel resection with primary anastomosis was performed in 84 % of patients (21/25) whereas revascularization and limited bowel resection was performed in 16 % (4/25). Five

patients were returned to the operating room for a second-look laparotomy. Of these, 3 patients (3/5, 60 %) survived with significant relation to survival.

In contrast, patients with venous occlusion, segmental resection of the involved bowel with primary anastomosis is accomplished easily, because the haemorrhagic infarction is limited⁽¹²⁾. Although *Pavel and coworkers*⁽²⁹⁾ advocated a second-look operation and enterostomy in some patients, none of the patients in this series required either procedure. Moreover, resection of the infarcted bowel was followed by immediate anticoagulant therapy and progression of the disease was not observed and a second-look operation was not required. However, the optimal duration of anticoagulant therapy has not been defined. *D'Abreu and Humble*⁽³⁰⁾ recommended that anticoagulant therapy should be continued indefinitely, because it reduced the incidence of recurrence from 30 % to 3 %.

In patients with occlusive arterial ischaemia, the mortality rate was 60 % within 30 days after surgery versus 14.2 % in patients with venous occlusion with statistically significant difference in favor of the latter ($P = 0.03$). Among patients with occlusive arterial ischaemia, mortality rate was 58.8 % in arterial embolism versus 62.5 % in arterial thrombosis but without statistically significant difference ($P = 0.4$). *Endean et al*⁽¹⁰⁾ reported a survival rate of 87 % in venous thrombosis versus 41 % and 38 % for arterial embolism and thrombosis respectively. They concluded that acute mesenteric ischaemia remains a difficult problem. The mortality rate remains high because of delay in diagnosis. Short bowel syndrome was recorded in 3 patients (12 %) with arterial occlusion

versus one patient (14.2 %) with venous occlusion without statistically significant difference. The survival rates at one year were 32 % and 85.8 % in arterial and venous occlusion respectively.

CONCLUSION:

Acute mesenteric ischaemia is a challenging clinical problem with diverse causes, which often results in delayed diagnosis and treatment. A strong clinical suspicion and an aggressive approach should be adopted in dealing with this condition because the outcome crucially depends on rapid diagnosis and treatment. With better understanding of the pathogenesis of acute mesenteric ischaemia and the availability of a range of diagnostic and interventional techniques and adjuvant pharmacotherapies, an improved outcome can be achieved.

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