Acute mesenteric ischemia (AMI) is a catastrophic disorder of the gastrointestinal tract with high mortality. Few data on the characteristics of this disease in Iran are available. Patient records of public and private hospitals in Shiraz, southern Iran, with impression of acute abdomen, bowel gangrene or abdominal pain, and patients with risk factors for this disease, who were admitted between March 1989 and March 2005, were reviewed. Among the 10,000 patient records studied, 105 patients (mean age 57 years) with AMI were identified. The mortality rate was 50.4%. The most common symptom was abdominal pain (98.1%). Heart diseases were seen in 44.7% of cases. The mortality rate was lower in patients undergoing mesenteric angiography (p=0.014). In those patients in whom the site of lesion was identified, venous thrombosis was the most common type (41.9%). AMI is a common cause of acute abdomen especially in elderly patients, with venous thrombosis being the most common type.

Acute mesenteric ischemia (AMI) is more common than its chronic form, has different etiologies and its clinical presentation is variable. Due to different factors such as increased awareness about the disease, and increase in life expectancy of the population, cardiovascular diseases and other systemic diseases, the past 25 years has seen an increase in the prevalence of AMI. Though an early diagnosis and prompt intervention are associated with decrease in mortality, there has not been an improvement in the outcome of AMI.

The lack of a characteristic clinical picture and low sensitivity and specificity of diagnostic tests results in problems in both diagnosis and treatment of AMI. Thus, diagnosis is often based on clinical suspicion. We did a retrospective analysis of patients who were admitted in private and public hospitals in southern Iran, during the period 1989-2005.

Methods
Hospital records of patients admitted in 6 public and 4 private hospitals in Shiraz, southern Iran, during 1989-2005 were analyzed. A manual search of all hospital records of 10,000 patients admitted with abdominal pain, bowel gangrene, or acute abdomen and those of patients with at least one known predisposing factor like atrial fibrillation, myocardial infarction or ischemia, diabetes mellitus, and vasculitis, was done; 300 cases with incomplete hospital data were not included in the final analysis, among which 5 cases were suspicious for AMI. One hundred and five (61 men) were found to have a final diagnosis of AMI based on post-operative and pathology reports. In cases where surgery had not been performed, the diagnosis was based on angiography. A uniform questionnaire was completed from the hospital records of each patient; patients with incomplete hospital records were excluded.

Data were analyzed using SPSS software, version 11.5. P value of less than 0.05 was considered significant.

Results
A total of 105 patients (mean age 57 [SD 20] years; male: female ratio 1.38) were diagnosed with AMI, a majority of whom had been diagnosed after the year 2000 (Table 1); 32 cases were diagnosed between 2002-2004.

The clinical impression (before investigations) was
recorded as AMI, bowel gangrene, and bowel obstruction or perforation in 37, 32 and 17 cases, respectively. The most common symptom was abdominal pain, and abdominal tenderness was found in a majority of cases (Table 2). The most common predisposing factor was heart disease.

Abdominal x-ray was performed in 99 cases. Abdominal ultrasonography was done in 52 cases, and was abnormal in 8 cases with ascites. CT scan was done in 10 cases, and did not show any specific findings for AMI. Diagnostic angiography was done in 9 patients; one of these patients died, as compared to 53 of 96 patients in whom angiography was not done (p=0.014).

On univariate analysis blood urea nitrogen (BUN) >25 mg/dL, acidosis, heart disease and age >40 years were associated with increased mortality (Table 3). On multivariate analyses only age > 40 years (p=0.01) and acidosis (p=0.047) were independently associated with mortality.

The mean (SD) time between onset of symptoms and presentation was 4.1 (3.5) days, surgery was done 1.3 (1.7) days after hospitalization. Ninety patients underwent laparotomy; 50 patients survived and 40 patients died 1.9 (2.6) days after the first surgery. Eight patients died before surgery. The most common complications following surgery were sepsis (n=52) and gastrointestinal bleeding (21). Twenty-five patients underwent second surgery, but this was mostly just an open–and–close surgery due to extensive bowel gangrene; bowel resection was done in 6 of these cases but all died due to progressive disease.

The mean duration of hospitalization was 6.7 (5.7) days. The most common cause of mesenteric ischemia was venous thrombosis (n=44; superior mesenteric 42, inferior mesenteric 7, both veins 5). Arterial emboli and thrombosis affected 27 and 20 patients, respectively; thrombosis of both the mesenteric artery and vein was seen in 3 cases. Among the arteries, superior mesenteric artery (SMA) was most commonly affected (n=34). Atrial fibrillation was present in 17 of 23 cases with SMA embolization as compared to 29 of 81 patients who did not have an embolus in the SMA (p=0.01).

### Discussion

Acute mesenteric ischemia constitutes 1-2% of all gastrointestinal diseases. AMI is a cause of increased mortality in the elderly. Despite advances in understanding of its pathophysiology, the mortality remains at 40%-95% in different studies in the last 25 years. In our study, the mortality was 50%.

Abdominal pain and vomiting were the most common complaints, accompanied by abdominal tenderness. Heart disease is one of the predisposing factors to mesenteric ischemia, and is reported in up to 83.8% of cases. In our study, heart disease was present in 44.7% of cases. In univariate analysis, older age, acidosis, elevated BUN and heart disease were associated with mortality in our patients.

Several studies reported SMA emboli as the most common form of AMI, followed by thrombosis of superior mesenteric artery, and venous thrombosis. In our study, venous thrombosis was more common than arterial emboli. Atrial fibrillation was more often associated with SMA embolization.

Abdominal ultrasonography was normal in majority of patients, and was not helpful in diagnosing AMI or ruling it out. The best method of diagnosis is angiography. In our study, very few patients underwent angiography; their mortality rate was lower than in other cases.

In several studies patients with a shorter interval between onset of symptoms and presentation do better. In this study the time factor, especially the interval between beginning of symptoms and referral of the patient to the hospital and the time between surgery and death was relatively short, compared to similar studies elsewhere.

A high index of suspicion of AMI in older patients with
unexplained abdominal pain and in those with predisposing factors will help to make an early diagnosis in these patients. Immediate mesenteric angiography and early surgery is more successful than conservative management in these patients.\textsuperscript{8,9} Therefore, these procedures should be initiated early in any patient suspected of mesenteric ischemia.

References


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Received April 28, 2008. Received in final revised form December 6, 2008. Accepted December 21, 2008