

ACUTE MESENTERIC ISCHEMIA IN CMH, RAWALPINDI

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ABSTRACT

Objective: To assess the clinical presentation, laboratory/radiological findings and operative findings in a series of patients diagnosed as Acute Mesenteric Ischemia at Combined Military Hospital Rawalpindi.

Study Design: Case series study.

Place and Duration of Study: Study was carried out at Combined Military Hospital Rawalpindi, from Jan 2016 to Jun 2016.

Methodology: Study included all the cases of the Acute Mesenteric Ischemia admitted in the wards and intensive care unit. Clinical history, examination findings and radiological variables were studied. Per-operative findings were also noted. Follow up was done to look for the prognosis.

Results: Of the twelve patients diagnosed with Acute Mesenteric Ischemia all were male. Two patients were below 50 years of age. Seven patients had pre-existing cardiovascular disease. Abdominal pain (90%) was the most common complaint and tenderness and re-bound tenderness was elicited in 10 patients. Most common ultrasonography finding was presence of free peritoneal fluid present in 6 patients. Computed tomography scan of patient showed classical signs in only 2 cases. Per-operatively Superior mesenteric artery was involved in 8 cases. The most common cause of Acute Mesenteric Ischemia was thromboembolism in 7 (58%) cases. Mortality rate was 50% and most common post-operative complication was respiratory distress requiring ventilator support in 8 (67%) cases.

Conclusion: Acute Mesenteric Ischemia is an abdominal emergency which presents with a variety of equivocal symptoms. Conventional laboratory and radiologic imaging help little in its diagnosis. High index of suspicion, early recognition and prompt treatment result in a better outcome.

Keywords: Mesenteric ischemia, Radiologic imaging, Thromboembolism.

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INTRODUCTION

Acute Mesenteric Ischemia (AMI) although a rare disease accounting for 0.1% of all hospital admissions is thought to have increased over last half century¹. It is a surgical emergency with reported mortality of 50-70% primarily due to delay in diagnosis². AMI is caused by inadequate blood flow in mesenteric vessels resulting in ischemia and eventually gangrene of the bowel wall. The most common cause of AMI is embolism in Superior mesenteric artery (SMA), followed by thrombosis and non-occlusive ischemia and very rarely mesenteric venous thrombosis³.

Risk factors associated with the development of AMI are older age, hypercoagulability, renal insufficiency, cardiac dysrhythmias and increased illness severity.

AMI remains a diagnostic challenge for the clinicians with pain abdomen out of proportion to the symptoms as the most common and important feature, followed by other gastrointestinal symptoms as nausea, vomiting, anorexia, abdominal distention and rectal bleeding⁴. A wide range of laboratory and imaging tests are available to diagnose AMI with angiography as a gold standard having both diagnostic and possible therapeutic role whereas contrast CT scan helps in early identification but has low yield. However clinical suspicion is a major factor in the correct interpretation of imaging studies².

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Patients can be treated surgically with revascularization, bypass, bowel resection or medically with vasodilator therapy, and stenting. Treatment outcome depends on patient selection and early treatment initiation⁵. The objective of our study was to assess clinical presentation, radiological findings and treatment modalities of AMI. In addition patients were closely followed for one month to assess the morbidity and mortality.

METHODOLOGY

This was a longitudinal observational case series study which was started after approval of ethical committee Combined Military Hospital Rawalpindi from 1st January 2016 to 30th June 2016. The data was collected by non-probability convenient sampling technique. World Health Organization (WHO) calculator was used to calculate the sample size. All the patients with age more than 30 years with characteristic signs, symptoms and histopathological diagnosis of AMI were included in the study. All the patients underwent ultrasonography and some selected patients had undergone contrast enhanced CT-Scan. Patients in which there were no per-operative findings of AMI were excluded from the study. A protocol proforma was designed to include particulars of the patients, initial signs and symptoms, relevant laboratory results, per-operative findings and radiological studies. Follow up was done after 04 weeks to look for post-operative morbidity and mortality. Relation of various signs and symptoms, operative findings, co-morbidities and relevant investigations were done. Histological co-relation was also carried out to find out the particular type of AMI.

The demographic data was analyzed using Statistical Package for the Social Sciences (SPSS) version 17 and mean with standard deviation was calculated for age, percentages, ordinal variables as symptoms, signs and CT findings.

RESULTS

A total of 12 patients were included in the study all of them were males (100%). Age of patients ranged from 35 to 72 years with mean age of 57.83 ± 11.99 years. Two (17%) patients

were under 50 years of age. Seven patients (58%) had some co-morbidity, two had undergone some vascular intervention for lower limbs and later presented with AMI and three patients had more than one disease. The main complaint of patients were pain present in 11 (92%) followed by abdominal distension present in 6 (50%), vomiting in 4 (33%), constipation and diarrhea 2 (17%). Fever was present only in one patient (8%). The examination findings included tachycardia in 5 patients (42%) and tachypnea in 4 patients (33%). Important positive abdominal examination included tenderness in 11 patients (92%) and rebound tenderness in 10 cases (83%), whereas, bowel sounds were present in half of the cases. Table shows the symptoms, sign and outcome of all the cases. Ultrasonography was performed in all cases, 7 (58%) patients had free fluid in peritoneum and Doppler was negative in 11 (92%) of cases. Contrast enhanced CT scan was done in half of the cases (in the other half CT could not be done either because of unstable state or deranged renal profile) and only two patients showed positive signs of AMI. The final diagnosis of AMI was made on histopathological report of specimen. SMA was involved in 8 (67%) cases, 2 (17%) had focal segmental necrosis, one had venous thrombosis and one had Inferior Mesenteric Ischemia. Figure shows the peroperative appearance of mesenteric ischemia in a young patient with dilated cardiomyopathy. Three (25%) patients had intestinal perforation and they had 100% mortality. Post-operative ventilator support was required in 8 (67%) cases. Progression and re-look surgery was done in 3 (25%) patients, 2 (17%) patients had acute kidney injury and 2 (17%) had septic complication. Half of the patients died within a month inspite of rigorous management. Thromboembolic mechanism was confirmed in 7 (58%) cases and no hypercoagulability was found in rest of cases.

DISCUSSION

AMI displays a vast range of macro and microscopic findings which can be classified into non-transmural and transmural on the basis of histological appearance. Non-transmural (muco-

sal necrosis) represents a less severe form of AMI which is generally along IMA distribution and usually heals with medical management whereas transmural (infarction) mostly involves SMA distribution and results in gangrene of gut,

AMI is a grave abdominal emergency and unfortunately there is a lack of published data in Pakistan about this disease. Most of the publications are case reports and we did not come across any case series⁷⁻⁹. This is for the first

Table: Descriptive features, Per-op findings and Post-op sequel of all patients with AMI (n=12).

S. No.	Age	Co-morbidis	Symptoms	Signs and radiological findings	Per-op findings	Post-op
1	53	IHD	Pain abdomen Vomiting X 4 days	Tenderness and rebound tenderness lower abdomen	Infarct in part of ileum, end to end anastomosis	Ventilator support for 4 days and AKI, recovered
2	70	ALI/DM	Abdominal distension and pain abdomen X 7 days	Signs of peritonitis and shock	Gangrenous small gut with perforation, loop ileostomy	Ventilator support, Death
3	66	PVD/IHD	Abdominal distension and vomiting X 1 day	Signs of peritonitis	Perforation of sigmoid gut with patchy gangrene, double barrel colostomy	Ventilator support, Death
4	58	-	Pain abdomen X 5 days	Rebound tenderness Pneumatosis Coli in CECT	All ileum gangrenous, loop ileostomy	Uneventful recovery
5	69	DM/HTN	Pain abdomen out of proportion X 2 days	No obvious signs	Gangrenous small gut, loop ileostomy	Ventilator support, recovered
6	55	-	Pain abdomen and diarrhea X 6 days	Rebound tenderness in lower abdomen and ascites	Patch of ileum gangrenous, end to end anastomosis-later progression further	ventilator support, re-op twice, recovered, Death due to MI
7	60	CVA	Abdominal distension and absolute constipation X 3 days	Distension and rebound tenderness in lower abdomen	Patchy gangrene of distal ileum and caecum, Rt. hemicolectomy and ileostomy	Ventilator support, AKI (dialysis), recovered
8	60	-	Pain abdomen and distension X 6 days	Signs of peritonitis	Distal ileum and caecalperforation, ileo-colostomy	Ventilator support, Death
9	35	-	Abdominal distension and dehydration X 3 days	Delirium tachypnea and tachycardia, abdominal distension	Initial op inconclusive. Distal ileum gangrenous, ileostomy	Ventilator support, tracheostomy, recovered
10	72	HTN	Pain abdomen, distension and constipation X 4 days	Tenderness and rebound tenderness in lower abdomen	Gangrene of ileum, end to end anastomosis	Re-look surgery-Progression of ischemia-Death
11	60	HTN	Pain abdomen, vomiting and constipation	Tenderness, Rebound Tenderness	Gangrene from DJ to mid transverse-perforation	Ventilator support-Death
12	36	-	Pain abdomen and diarrhea	Tenderness, Intramural gas seen in CECT	Gangrene distal ileum and caecum -ilio-colic anastomosis	Uneventful recovery

Ischemic Heart disease (IHD), Acute Limb Ischemia (ALI), Diabetes Mellitus (DM), Peripheral Vascular Disease (PVD), Hypertension (HTN), Cerebrovascular accident (CVA), Acute kidney injury (AKI), Duodeno-jejunal (DJ), Contrast Enhanced Computerized Tomography (CECT)

ultimately leading to perforation⁶. This was observed in our case where 10 patients had SMA involvement which turned out to be transmural infarction on histopathology.

time a study has been conducted to see the spectrum and outcome of AMI cases in our setup to better understand this disease. Secondly our study had twelve patients over a period of just six

months which indicates a much higher incidence of AMI, which can be explained by the fact that our setup is a tertiary care center of Pakistan army, covering a large catchment area including whole of Kashmir, KPK, GilgitBaltistan and upper Punjab.

Jeican *et al* reported in their case series that male gender and age more than 50 years is a risk



Figure: Showing gangrenous ileum in patient of AMI with SMA involvement.

factor for developing AMI¹⁰. Similarly in our study all cases were males and only two patients were below 50 years. The most common symptom seen in AMI was pain often out of proportion to signs followed by gut emptying (diarrhea and vomiting) in most cases. Stanley and colleagues showed that pain out of proportion in presence of normal abdominal examination is an indication towards underlying gut ischemia¹¹. In our study we found tenderness and rebound tenderness in lower abdomen to be most common sign. The possible cause of tenderness and rebound tenderness is the presence of inflammatory exudative fluid causing irritation of peritoneum.

Previous history of cardiovascular disease is major risk factor for development of AMI and our study, was consistent with this finding³. Embolic phenomenon was confirmed in half of our cases as reported in prior studies which showed that in 40-50% cases of AMI, the cause was embolus mostly from cardiovascular origin¹². We therefore recommend a thorough screening of all the cases of AMI. In fact two patients who presented with AMI had underlying dilated cardiomyopathy and were diagnosed later.

Ultrasonography and Doppler were both found to be non-specific and were operator dependent as shown in other studies as well¹³. Contrast enhanced CT was done in selected cases where there were other differentials in mind and it showed classical *Pneumosis Coli* feature in just two cases meaning that it also has low yield². Laboratory investigations were mostly non-specific however 9 cases had total leucocyte count more than $14 \times 10^9/L$ which has also been described in previous studies¹⁴.

Mortality rate after surgical treatment was 50% which is in coherence with the international published data¹⁵. Intestinal perforation was found to be significantly associated with mortality. Morbidity was also high, respiratory complications were high requiring ventilator support in most cases. This can be explained by lack of pain control and wide spread inflammatory response to ischemia causing respiratory distress. Two patients had acute kidney injury. Charra *et al* reported more chances of gut ischemia in patients of renal insufficiency¹⁶. Re-look surgery was done in one-third of patients, where there was ambiguity about the viability of gut but it should be weighed against the possible adverse effects^{17,18}.

CONCLUSION

Acute Mesenteric Ischemia is an uncommon but debilitating disease with vague abdominal symptoms having very high mortality and morbidity. Repeated clinical examination aided by radiological imaging and high index of suspicion is crucial in diagnosis. Early surgical intervention improves overall outcome.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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