Section: General Surgery

Original Research Article

EXPERIENCE WITH MESENTERIC ISCHEMIA IN TROPICS – SINGLE CENTRE STUDY

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ABSTRACT

Background: Mesenteric ischemia (MI) is a life-threatening condition caused by decrease in blood flow to the intestines, leading to ischemia and potential necrosis of bowel tissue. Early diagnosis and intervention, including revascularization or bowel resection, are critical for improving survival, as MI is associated with high morbidity and mortality if left untreated.
Materials and Methods: A retrospective study was conducted in the Department of Surgery, NRI Medical College and Hospital including 30 patients with mesenteric ischemia.
Results: The study of 30 patients with mesenteric ischemia (MI) found that most were middle-aged males, with hypertension (55.5%) and diabetes (29.6%) as common risk factors. Surgical interventions, including resection and anastomosis (40%), were frequently required due to severe cases, evidenced by 33.3% having gangrenous bowel loops. One death was reported.
Conclusion: Mesenteric ischemia is a surgical emergency and needs prompt detection so as to prevent gangrene of intestines.
Keywords: Mesenteric ischemia, SMA occlusion, CT, bowel resection.

INTRODUCTION

Mesenteric ischemia (MI) is a life-threatening condition characterized by sudden reduction in blood flow to the mesenteric vessels, leading to bowel ischemia. Epidemiologically, MI is relatively rare but has a high mortality rate, often affecting older adults with cardiovascular risk factors. The incidence is estimated at approximately 1 in 1,000 hospital admissions, with an increased prevalence in individuals over 60 years of age, especially those with atherosclerosis, atrial fibrillation, or low cardiac output states.[1,2]

The etiologies of MI can be classified into four main categories: arterial embolism (most common, typically from a thrombus in the left atrium), arterial thrombosis (usually secondary to atherosclerosis), non-occlusive mesenteric ischemia (NOMI) (linked to hypoperfusion states or vasoconstriction), and mesenteric venous thrombosis. Clinically, MI presents with nonspecific symptoms, such as sudden-onset severe abdominal pain, out of proportion to physical findings, nausea, vomiting, and diarrhea, which can progress to peritonitis and septic shock in advanced stages.[3]

Diagnostic investigations are crucial for early detection. Contrast enhanced Computed tomography (CECT) has high sensitivity (up to 96%) and specificity (around 94%) for identifying vascular occlusions and bowel ischemia. The hallmark findings in a triple contrast CECT (oral, intravenous, and rectal contrast), include bowel wall thickening, absence of bowel wall enhancement, and intramural gas, with the latter indicative of bowel necrosis. A specific "vessel cutoff sign" may indicate superior mesenteric artery occlusion.[4-6]

Computed tomography angiography (CTA) is the investigation of choice, revealing bowel wall thickening, pneumatosis intestinalis, portal venous gas, or thrombus in the mesenteric vessels.[7]

Intra-operative findings may include ischemic or necrotic bowel segments, cyanotic or dusky bowel, and loss of peristalsis. In advanced cases, perforation and peritonitis may be encountered, necessitating urgent surgical intervention. The prognosis for MI is poor without timely

intervention; mortality rates can reach 50-90% if treatment is delayed until after infarction occurs.[8]
This study evaluates patients with mesenteric ischemia presenting to the Department of Surgery for the risk factors, etiology, presentation, sonological evidence, prognosis and treatment outcomes.

MATERIALS AND METHODS

A retrospective review of case records was conducted in the Department of General Surgery, NRI Medical College &General Hospital, to evaluate clinical outcomes, diagnostic modalities, and management strategies in patients diagnosed with mesenteric ischemia (MI).
The review of case records was conducted over a 2-year period, from September 2022 to August 2024, at a tertiary care center. Ethical approval was obtained from the hospital's Institutional Review Board (IRB) prior to data collection.
The study included a cohort of 30 patients diagnosed mesenteric ischemia based on clinical suspicion and confirmed via imaging or intraoperative findings. Patients were identified through a review of medical records from the hospital's database. Inclusion criteria consisted of adult patients (>18 years) who presented with MI, confirmed by computed tomography angiography (CTA) or laparotomy. Exclusion criteria included patients below 18 years of age; patients with sepsis / MODS at presentation; patients with blunt trauma of abdomen or incomplete medical records, and those who died before a confirmed diagnosis.
Data was extracted retrospectively from medical records, including patient demographics (age, gender, comorbidities such as atrial fibrillation, coronary artery disease, or hypertension), clinical presentation (abdominal pain, nausea, vomiting, peritonitis), and laboratory parameters. Diagnostic modalities, particularly imaging findings from triple contrast CT scans, were reviewed. Details on management strategies (medical, endovascular, or surgical interventions) and intraoperative findings (bowel necrosis, perforation, or revascularization) were documented.
Descriptive statistics were used for demographic and clinical variables. Statistical significance was set at $p < 0.05$.

RESULTS

This retrospective study included 30 patients with MI. The mean age of study population is 53.2 years. The age distribution shows that most patients are in the 41-60 years age range, with 80% being male. Common risk factors include hypertension (55.5%) and diabetes (29.6%), with 10% having no risk factors. All patients reported abdominal pain, while 90% experienced vomiting, and 60% had fever. GI bleeding was less common, occurring in only 10% of cases. Clinical examination revealed abdominal tenderness and the absence of bowel sounds in most patients. [Table 1]

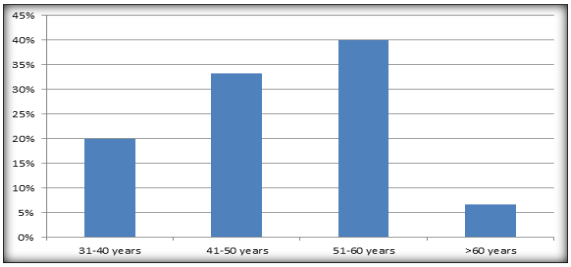

Figure 1: Age wise distribution

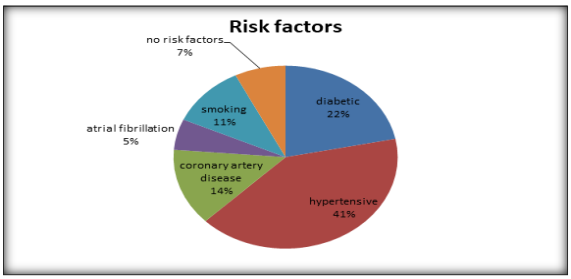

Figure 2: Risk factors

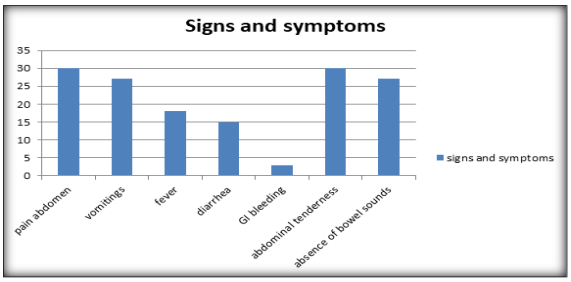

Figure 3: Symptomatology

In present study, 80% of the patients had acute mesenteric ischemia (AMI) primarily manifesting within a duration of less than three months and 20% had chronic mesenteric ischemia (CMI) with symptoms persisting for more than three months.
CT findings indicate that 70% had dilated bowel loops, while 40% had superior mesenteric artery (SMA) occlusion. Celiac artery occlusion was present in 30%, and thrombosis was found in 20%. Gangrenous bowel loops were seen in 33.3% of the patients, suggesting severe disease progression in some cases. 1 patient had both superior mesenteric artery (SMA) and vein (SMV) occlusion.

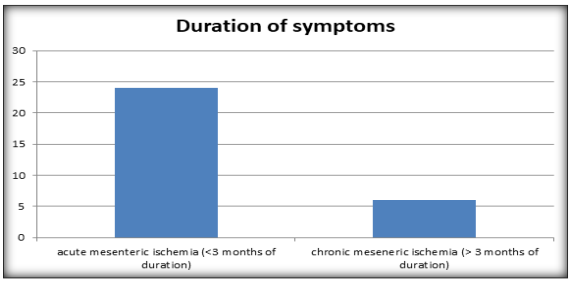

Figure 4: Acute mesenteric ischemia Vs Chronic mesenteric ischemia

In terms of management, 30% were treated conservatively, while 40% underwent resection and anastomosis. Resection with ileostomy was performed in 20%, and 10% of patients received balloon angioplasty and stenting. This distribution highlights that surgical interventions, particularly resection, were common due to the severity of the condition. [Table 2]

Out of 30 patients, 1 patient died due to post-operative sepsis.

Table 1: Duration of symptoms

Duration of symptoms	Acute mesenteric ischemia	Chronic mesenteric ischemia
< 3months	24	-
>3 months	-	6

Table 2: CT findings

CT findings	Total No. of persons
Dilated bowel loops	21 (70%)
SMA occlusion	12 (40%)
Celiac artery occlusion	9 (30%)
SMV Thrombosis	6 (20%)
Gangrenous bowel loops	10 (33.3%)
No evidence of occlusion	1 (3.3%)
Both SMA & SMV occlusion	1 (3.3%)

Table 3: Management

Management		No. of patients
Conservative		9 (30%)
Surgery	Resection and anastomosis	12 (40%)
	Resection and ileostomy	6 (20%)
Balloon angioplasty and stenting		3 (10%)

DISCUSSION

The findings of this retrospective study align closely with those of previous research on mesenteric ischemia (MI), particularly in terms of patient demographics, risk factors, clinical presentation, diagnostic imaging, and management strategies. The study population, with a mean age of 53.2 years and a male predominance (80%), is consistent with trends observed in other studies, such as those by Acosta et al.9 and Bala et al.10 which also reported a higher incidence of MI among middle-aged to older males. This gender bias can be attributed to lifestyle-related risk factors, such as hypertension (55.5%) and diabetes (29.6%), as identified in the present study and corroborated by Bala et al,[10] who noted similar prevalence rates of these conditions among MI patients.

Symptomatically, the study found that abdominal pain was universal among patients (100%), accompanied by vomiting (90%) and fever (60%). These findings are echoed in the work of Clair and Beach et al,[11] who also observed abdominal pain as a defining symptom of MI. Additionally, Luan et al,[12] identified vomiting and fever as common indicators of disease severity, underscoring the importance of early symptom recognition in improving outcomes.

The study's reliance on CT imaging to diagnose MI—specifically findings like dilated bowel loops (70%) and superior mesenteric artery (SMA) occlusion (40%)—parallels the recommendations of Tilsed et al,[13] and Bala et al,[10] who emphasized the diagnostic value of CT angiography in identifying ischemic changes and vascular occlusions. Both studies suggest that timely imaging is critical for the diagnosis of MI, a disease that can rapidly progress to bowel necrosis, as seen in 33.3% of patients in the present study.

Regarding management, 60% of patients in the present study required surgical intervention, including bowel resection. This finding is supported by Bjorck et al,[14] who noted a high rate of surgical management in patients with advanced MI, particularly when gangrenous bowel is involved. The importance of early surgical intervention is reinforced by the work of Bala et al,[10] who found that delayed surgery is associated with higher morbidity and mortality rates.

CONCLUSION

The study highlights that acute mesenteric ischemia (MI) primarily affects middle-aged males, with hypertension and diabetes being the most prevalent risk factors. Symptoms such as abdominal pain, vomiting, and fever were common among patients, with abdominal tenderness and the absence of bowel sounds frequently observed on clinical examination. Imaging findings, including dilated bowel loops and occlusion of major arteries like the superior mesenteric and celiac arteries, underscore the severity of the condition. Gangrenous bowel loops, present in one-third of the patients, further indicate the progression to advanced disease in many cases. As a result, surgical interventions, particularly resection with or without ileostomy, were often required, with conservative management reserved for less severe cases. The findings emphasize the critical need for early detection and timely surgical intervention to improve outcomes in patients with MI.

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Conflicts of Interest: the authors declare none conflicts of interest.

REFERENCES

1. Hirsch AT, Haskal ZJ, Northup PG, LoGerfo FW. Acute mesenteric ischemia: epidemiology, pathophysiology, and clinical features. J Vasc Surg. 2020;71(3):745-56.
2. Sarkar A, Prasad R. Clinical and surgical outcomes in acute mesenteric ischemia. Ann Surg. 2022;275(1):112-9.
3. Bala M, Catena F, Kashuk J, De Simone B, Gomes CA, Weber D, Sartelli M, Coccolini F, Kluger Y, Abu-Zidan FM, Picetti E, Ansaloni L, Augustin G, Biffl WL, Ceresoli M, Chiara O, Chiarugi M, Coimbra R, Cui Y, Damaskos D, Di Saverio S, Galante JM, Khokha V, Kirkpatrick AW, Inaba K, Leppäniemi A, Litvin A, Peitzman AB, Shelat VG, Sugrue M, Tolonen M, Rizoli S, Sall I, Beka SG, Di Carlo I, Ten Broek R, Mircea C, Tebala G, Pisano M, van Goor H, Maier RV, Jeekel H, Civil I, Hecker A, Tan E, Soreide K, Lee MJ, Wani I, Bonavina L, Malangoni MA, Koike K, Velmahos GC, Fraga GP, Fette A, de'Angelis N, Balogh ZJ, Scalea TM, Sganga G, Kelly MD, Khan J, Stahel PF, Moore EE. Acute mesenteric ischemia: updated guidelines of the World Society of Emergency Surgery. World J Emerg Surg. 2022 Oct 19;17(1):54. doi: 10.1186/s13017-022-00443-x. PMID: 36261857; PMCID: PMC9580452.
4. Chevallier J, Marincek B. Imaging modalities in acute mesenteric ischemia: focus on triple-contrast CT. Radiol Clin North Am. 2019;57(2):345-60.
5. Vanella G, Borrelli V, Tinti S, Mancini M. Triple-contrast CT in the evaluation of acute mesenteric ischemia: diagnostic accuracy and clinical implications. Eur Radiol. 2021;31(5):2823-32.
6. Garzelli L, Nuzzo A, Copin P, Calame P, Corcos O, Vilgrain V, et al. Contrast-Enhanced CT for the Diagnosis of Acute Mesenteric Ischemia. American Journal of Roentgenology. 2020 Jul;215(1):29–38.
7. Rutter MW, Smith TO. Non-occlusive mesenteric ischemia: pathophysiology and management strategies. Crit Care Med. 2018;46(7): e661-9.
8. Patel HA, Saad WA. Diagnosis and management of acute mesenteric ischemia. Am J Gastroenterol. 2021;116(4):657-69.
9. Acosta S, Björck M. Acute mesenteric ischemia. Curr Opin Crit Care. 2015;21(5):380-5.
10. Bala M, Kashuk J, Moore EE, Kluger Y, Biffl W, Gomes CA, et al. Acute mesenteric ischemia: guidelines of the World Society of Emergency Surgery. World J Emerg Surg. 2017;12(1):38.
11. Clair DG, Beach JM. Mesenteric ischemia. N Engl J Med. 2016;374(10):959-68.
12. Luan Y, Wang Q, Jiang H, Ding H. Acute mesenteric ischemia: clinical characteristics and outcomes. Front Surg. 2022; 9:807754.
13. Tilsed JV, Casamassima A, Kurihara H, Mariani D, Martinez I, Pereira J, et al. European guidelines on the management of acute mesenteric ischemia. Intensive Care Med. 2016;42(5):763-73.
14. Bjorck M, Koelemay M, Acosta S, Bastos Gonçalves F, Kolbel T, Kolkman JJ, et al. Editor's choice – management of the diseases of mesenteric arteries and veins: clinical practice guidelines of the European Society of Vascular Surgery (ESVS). Eur J Vasc Endovasc Surg. 2017;53(4):460-510.