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Original Research Article

Clinico-pathological evaluation and co-morbidities in superior mesenteric artery thrombosis

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ABSTRACT

Background: Mesenteric artery thrombosis (MAT) is a condition involving occlusion of the arterial vascular supply of the intestinal system. It is a severe and potentially fatal illness typically of the superior mesenteric artery (SMA), which provides the primary arterial supply to the small intestine and ascending colon. The occlusion may occur due to underlying atherosclerotic disease or embolic occlusion from a distant source, as atrial fibrillation. The condition possesses a high mortality rate and prompt recognition and treatment are of utmost importance.
Methods: A retrospective, observational, single hospital base study done during the period from 2015 to 2020 in the department of surgery, Gandhi Medical College, Bhopal. Sample size was taken 50 patients.
Results: In our study, out of 50 patients, 34% patients were in the age group between 55-65 years, history of smoking was present in 44%, hypertension in 36%, past history of atrial fibrillation in 10%, signs of peritonitis were present in 62% patients. Out of 50 patients, 42% was operated while 58% were managed conservatively. Amongst operated patients, in 72% partial bowel resection was done while in 28% extensive bowel resection was done, 66% were discharged while 28% patients died, amongst 21 operated patients, 57% were discharged while 43% died.
Conclusions: In this study, SMA thrombosis is more common in patients with smoking, cardiac diseases (hypertension, atrial fibrillation, ischemic heart disease, CVA), dyslipidaemia. Early intervention as thrombolysis or bypass surgery is needed to prevent complications like extensive bowel ischemia.

Keywords: SMA, Thrombosis, Mesentery, Ischemia, Gangrene

INTRODUCTION

Mesenteric ischemia is an acute or chronic perfusion abnormality of the gastrointestinal tract. SMA thrombosis is a life-threatening vascular emergency, with a mortality of up to 80%. However, there has been a slight improvement in recent years, perhaps due to use of contrast enhanced CT allowing earlier definitive diagnosis and better control of atrial fibrillation, reducing systemic thromboembolism, one of the major underlying causes.[1,2]

Chronic mesenteric ischemia (CMI) is a more insidious disease, which can cause severe cachexia and result in a significant reduction in patient quality of life.[3,5] Around 20% of patients with CMI go on to develop AMI, offering a high risk population in whom earlier diagnosis and treatment could potentially reduce the catastrophic impact of AMI.[4,5] Unfortunately however, many patients first presentation is with bowel infarction, posing the question of how these patients can be identified earlier.[6,8]

The diagnosis of SMA thrombosis is clinically difficult, due to the non specific symptoms and signs. However, SMA thrombosis is an important diagnosis to consider typically in elderly patients with acute abdominal pain out of proportion to clinical signs, particularly those with a previous history of vascular disease or atrial fibrillation.[8,11,12]

CMI is a diagnosis of exclusion, but a history of post prandial pain and weight loss is suggestive, highlighting the importance of taking a careful patient history.[15,16] Early diagnosis is important to improve patient's symptoms and to prevent bowel infarction with its associated morbidity and mortality.

Aims and objectives

The aims and objectives were to study the clinical and pathological evaluation of patients of SMA thrombosis in patients attending Hamidia Hospital, Bhopal; to evaluate co-morbidities in patients of SMA thrombosis; to assess the role of imaging technique in early identification of disease; to evaluate the outcome of patients in relation to the severity of occlusion.

METHODS

Study centre

The study was conducted in the institute of general surgery, Gandhi Medical College, Bhopal.

Type of study

The study was a comparative, retrospective and observational study.

Study duration

The study duration was from January 2015 to December 2020.

Sample size

The sample size was 50.

Ethical approval

Ethical approval taken from ethical committee of Gandhi Medical College, Bhopal.

Inclusion criteria

Patients admitted to the Hamidia Hospital with suspected SMA thrombosis in whom SMA thrombosis was confirmed by laparotomy, CECT abdomen or patients CT angiography; aged >12 years were included in the study.

Exclusion criteria

Patient with history of laparotomy for acute abdomen; patients aged <12 years were excluded from the study.

Procedure

As patient admitted in department of general surgery with complaints of pain abdomen, ultrasound abdomen, X-ray abdomen, routine blood investigation was done. Some selected patients CT angiography was done. After confirmation of SMA laparotomy was planned. Postoperative period also observed patient condition and thrombolysis also used in some patients. Routine blood investigation such as haemoglobin, WBC, platelets, PTINR, lipid profile. All collected data will be analysed and statistical tool such as excel sheet, software were used to conclude the data.

RESULTS

In our study, a total of 50 patients in the age group 25 years to 65 years with SMA thrombosis were evaluated. In our study, 34% patients were in the age group between 55-65 years.

Table 1: Gender.

Gender	Frequency	Percentage
Female	18	36
Male	32	64
Total	50	100

Table 2: Cardiac history.

	Frequency	Percentage
Negative	38	76
Atrial fibrillation	10	20
IHD	2	4
Total	50	100

Table 3: Smoking.

Smoking	Frequency	Percentage
+	28	56
-	22	44
Total	50	100

Table 4: TLC.

TLC	Frequency	Distribution
Normal	10	20
Elevated	40	80
Total	50	100

In the study majority of patients were male (64%). Sex had not found to be associated with SMA thrombosis in other studies.

In our study, 44% patients had past history (hypertension, portal vein thrombosis, CVA) 24% patients had previous cardiac history of atrial fibrillation, IHD.

Table 5: Dyslipidaemia.

Dyslipidaemia	Frequency	Percentage
+	12	24
-	38	76
Total	50	100

Table 6: INR.

INR	Frequency	Distribution
Normal	40	80
Abnormal	10	20
Total	50	100

Table 7: Signs of peritonitis.

Sign of peritonitis	Frequency	Distribution
+	31	62
-	19	38
Total	50	100

Table 8: Management.

Management	Frequency	Distribution
Operative	21	42
Conservative	29	58
Total	50	100

Table 9: Outcome.

Outcome	Frequency	Distribution
Discharged	12	57.14
Certified	9	42.86
Total	21	100

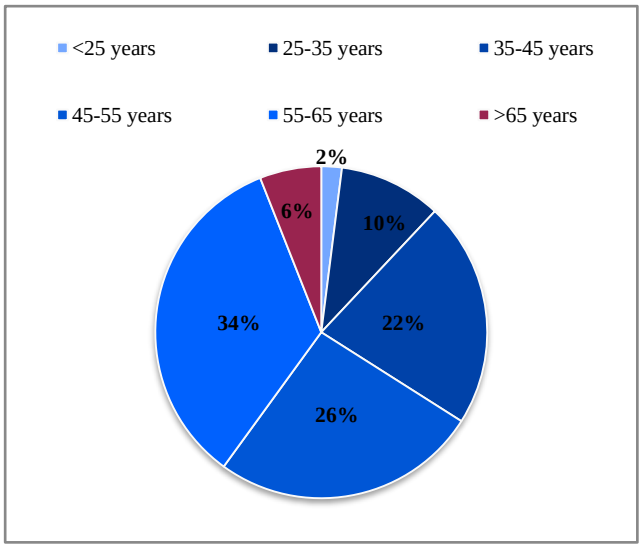

Figure 1: Age distribution.

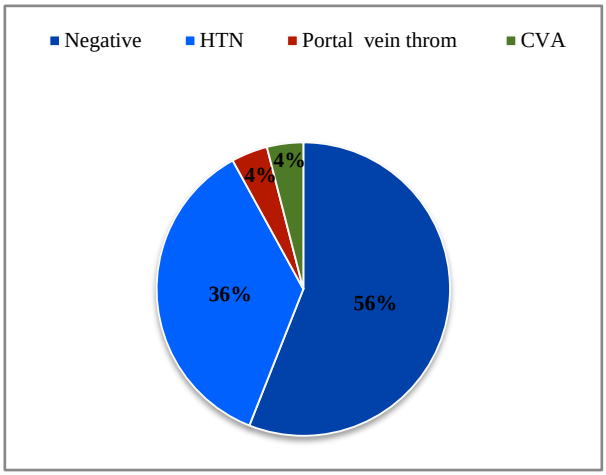

Figure 2: Past history.

Cigarette smoking can harm blood vessels and increase the risk of developing plaque build in the arteries. When coupled with high blood pressure, obesity, unhealthy cholesterol levels or uncontrolled diabetes, smoking puts at an even greater risk of developing mesenteric ischemia.

Counts more than 12000 /mm^3 and less than 4000 /mm^3 occurs in late stages of bowel gangrene when SIRS developed. Abnormal count can also occur in bowel. Abnormal counts were observed in 80% patients.

Dyslipidaemia is associated with increased risk of atherosclerosis which may cause SMA thrombosis. In our study, 24% patients had dyslipidaemia.

Thrombosis is attributed to combination of Virchow's triad, stagnated blood flow, hyper coagulability and vascular inflammation, but approximately 20% are idiopathic. SMA is particularly vulnerable because of its relatively larger diameter and low take off angle from the aorta. SMA thrombosis can often be successfully treated with a continuous infusion of unfractioned heparin. About 20% cases in our study had dearranged coagulation profile.

Clinical features of peritonitis (abdominal distension, guarding, rigidity), reduced urine output develop when the ischemia became transmural which was observed in 62% patients. This can occur in peritoneal inflammation of any aetiology like perforation.

DISCUSSION

Length of bowel ischemia predicted outcome, the severity of SMA thrombosis is directly proportional to percentage of occlusion and level of occlusion of SMA (aortic ostium, proximal or distal to middle colic artery). More than 50% involvement was significant, more than 75% involvement required surgical intervention, 95% involvement was associated with poor prognosis.[11,13-15] In our study 58% patients had classifiable occlusion (aortic

ostium-6%, proximal to MCA-34%, distal to MCA-18%) while 42% patients had unclassifiable occlusion.

Early recognition and revascularisation would have been a pre requisite for survival in at least half of the patients, since the jejunum, ileum and colon were affected by infarction. Early diagnosis and timely surgical intervention were the cornerstones of treatment and were essential to reduce the high mortality associated with this entity.[18-20] In our study, about 58% patients were managed conservatively while 42% operated.

Age, time delay to surgery, shock and acidosis significantly increased the risk of mortality due to AMI, whereas intestinal resection had a protective effect. However, only previous cardiac illness, acute renal failure and large bowel ischemia had a negative impact as independent risk factors of mortality of AMI.[4,11,16-18]

Mortality and morbidity rates increased with increasing length of resected bowel.[17,18] In the study, partial bowel was resected in 72% patients and total bowel was resected in 28% patients out of 21 operated patients.

In parallel with rapid resuscitation and careful assessment of the CTA, the patient should be explored to assess bowel viability, re-establish vascular flow and resect non-viable bowel. Subsequently, the employment of damage control techniques and continued critical care resuscitation was essential.[21,22] In our study, 58% patients were discharged while 42% patients died out of 21 operated patients.

Limitation of study

Sample size of this study was small. Follow up of patient was only postoperative period and 2 month after discharge.

CONCLUSION

SMA thrombosis is a condition involving occlusion of the arterial vascular supply of the intestinal system. It is a severe and potentially fatal illness of the SMA, which provides the primary arterial supply to the small intestine and ascending colon. The occlusion may occur due to in situ thrombosis of the vessel, most commonly due to underlying atherosclerotic disease, or embolic occlusion from a distant source as may occur in patients with atrial fibrillation. In the study, out of 50 patients, 64% were males while 36% females. 34% patients were in the age group between 55-65 years, 2% patients were less than 25 years. History of smoking was present in 44% patients. History of hypertension was present in 36% patients. Past history of atrial fibrillation was present in 10% patients. History of IHD was present in 4% patients, 4% patients had history of CVA in past. 24% patients had deranged lipid profile. Septicaemia was present in 80% patients (WBC count between 12,000-20,000 in 58% patients and count >20,000 in 22% patients). Signs of peritonitis were present in 62% patients. Out of 50 patients 42% patients was operated while 58% patients were managed conservatively. Amongst operated patients, in 72% patient's partial bowel resection was done while in 28% patients extensive bowel resection was done. 66% patients were discharged while 28% patients died. Amongst 21 operated patients, 57% patients were discharged while 43% patients died. In our study, SMA thrombosis is more common in patients with smoking, cardiac diseases (hypertension, atrial fibrillation, ischemic heart disease, CVA), dyslipidaemia.

Prognosis is relatively better in partial occlusion as compared to complete occlusion, hence, early intervention in form of thrombolysis or bypass surgery is needed to prevent complications like extensive bowel ischemia. High risk patients should be screened regularly to prevent SMA thrombosis.

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