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Mesenteric Ischemia in Covid19 Patients

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INTRODUCTION

In 2019 December the world faced with unknown cause of sever pneumonia., in Wuhan city in china it was sever acute respiratory distress syndrome by corona -2 (SARS- COV-2).¹

on February the world health organization named the outbreak of disease covid 19 virus disease.² on march2020 World Health Organization declare that outbreak of covid 19 virus is pandemic.³

by the time of December 2020 about 70million cases diagnosed and 1.5 million deaths.⁴ at the start of covid 19 there is thought that it affects respiratory system only as rapid spread of covid 19 virus infection there is correlation between the covid19 virus infection with thrombosis and thromboembolism.⁵

In covid 19 virus there are gastrointestinal manifestations mesenteric vascular occlusion or thrombosis of big abdominal vessels either arterial or venous is fetal disease ⁶, if combined with covid 19 infection there is high mortality mesenteric ischemia is fatal disease 80-90%in operated patient and 100%in non-operated patient this mostly because unclear symptoms delaying diagnosis, and irreversible changes that happened in the intestinal wall.⁷

ABSTRACT

Background: As covid 19 discovered it's not only respiratory virus but affect all body system without exclusion

Aim of the study: To show the relation between covid 19 infection and mesenteric ischemia

Patients and Methods: This study done prospectively on 15 patient with covid 19 and acute mesenteric ischemia admitted to the surgical unite in the new Damietta university hospital managed with surgical interference by laparotomy or conservative with anticoagulants.

Results: This study done over 15 patients with positive covid 19 and most of them are old age with comorbidity and as diabetes mellitus the mean age 55.5% abdominal pain is the commons symptoms in 100 of the patients 8 patient underwent laparotomy 53.5 % 6 patient expired 40 %

Conclusion: It is important to understand the relation between the covid 19 infection and thromboembolism in mesenteric vessels prophylactic anticoagulants is corner stone to prevent mesenteric ischemia.

Keywords: covid 19; mesenteric ischemia; coagulopathy.

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the pathology behind the Mesenteric ischemia with covid 19 is unclear for long time, theory of endothelial injury is part of pathogenesis. Real of over amount of inflammatory cytokines like tumor necrosis factor, interleukin 6, Interleukin (IL) -6, IL-8, and IL-1 β , is part of cytokines storm which leads to multi organ failure also patient with hypoxia has increases risk of thrombosis especially in immobile patients.^{8&9}

presentation of mesenteric ischemia is vague of gastrointestinal symptoms, nausea, vomiting, diarrhea, and abdominal distention. Due to non-specific symptoms of mesenteric ischemia the radiological investigation is the main way to diagnosis of this disease.¹⁰

Ultrasonography and abdominal radiology have low sensitivity and specificity C T is main line of radiological diagnosis replacing angiography.¹⁰

After diagnosis immediate surgical interference is best way of treatment to avoid the rate of mortality, ICU admission is needed in about 30% of patient with mesenteric ischemia even on anticoagulant.^{11&12}

The aim of this study is to evaluate the diagnosis and treatment of mesenteric ischemia in covid 19 positive patient

PATIENTS AND METHODS

this study is prospective study done on 15 patient presented to emergency room with manifestation of intestinal obstruction in surgical department in the new Damietta Al-Azhar university hospital, Arab republic of Egypt, from first July 2021 to first January 2022.

preoperative preparations all patients exposed to detailed history examination and all investigation (CBC, liver function, kidney function, coagulation profile x ray of the abdomen chest x-ray, abdominal CT scan and chest C T was done to detect covid 19 with pneumonia) all of them are covid 19 positive d dimer 10 patients male and 5 patient female all patients underwent surgical operation laparotomy

Ethical consent: An approval of the study was obtained from Al-Azhar University Academic and Ethical Committee. Every patient signed an informed written consent for acceptance of the participation in the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

RESULTS

This study conducted over 15 patients with demographic distribution according to age, sex, symptoms, signs and anticoagulant

In our study the age of the patients ranges from 16 to 89 year with the mean age is 55.5 %the youngest age is 16 and the oldest is 89.

6patient are female 40% ,8patient are male 60% with increased the incidence of coagulopathy in male more than female.

15 patients presenting with abdominal pain 100% of the patient, 5patient presented with bleeding per rectum and hematemesis,33.3% one patient presented with nausea

6.6%.5patient started with LMWH33.3%,5patientwith acetyl salicylic acid (ASA) 33.3% and 5patients with no anticoagulant 33.3%and

5 patients with comorbidity diabetes mellitus and hypertension 33.3% 8patients underwent laparotomy 53.3% all exploration laparotomy resection anastomosis done for them, and intraoperative diagnosis of intestinal ischemia and 3patients no intervention20%,2patient of them 13.3% with anticoagulant not fit for surgery 9patients discharged in good condition,3patient20% of the expired patient were explored and 2patient 13.3%expired without intervention.

the mod of diagnosis as follow 9 patients diagnosed with PCR (polymerase chain reaction) by swab from the nasopharynx, for the covid 19about 60%and 5 patients diagnosed with CT chest about 33.4% with the characteristic ground glass appearance of covid 19, one patient diagnosed by both CT chest and PCR 6.6%. 9 patients discharged in good condition and 6

patients expired 40%, it is very high incidence of mortality when compared with non-pandemic time in usual situations.



Fig 1: Intestinal gangrene.



Fig 2: Intestinal gangrene after excision.



Fig 3: Colonic gangrene.



Fig 4: Colonic gangrene after excision

Character number	age	Sex	Complaint	Ct	ASA-APT	D dimer	Outcome	comorbidity	Intervention	Diagnosis of covid 19
1	16	F	Abdominal pain +vomiting	+	ASA		Discharge		Exp lap	PCR
2	39	F	Vomiting	+	LMWH		Discharge		Exp lap	PCR
3	33	M	Abd pain	+	NO		Discharge		Exp lap	PCR
4	89	M	Abd p	-	NO		Died	DM Hypertensive	Exp lap	CT
5	40	F	Nausea	-	ASA		Discharge		Act	PCR
6	89	M	Lower git bleeding	+	LMWH		Died	IHD D M	No	CT
7	65	M	Hematemesis	+	NO		Died		Exp lap	PCR
8	60	F	Abd pain	-	ASA		Died		Exp lap	
9	55	M	Abd pain distension	+	NO		Discharge			PCR+CT CHEST
10	60	M	LGIT bleeding + Abd pain	+	LMWH		Discharge		Epl lap	CT
11	67	F	Hematemesis	+	LMWH		Died	DM I HD	No	PCR
12	43	M	Abd pain	-	ASA		Discharge		Exp lap	PCR
13	67	M	Distention	+	NO		Discharge		Exp lap	CT
14	80	M	Nausea	+	ASA		Died	OBESITY	No	PCR
15	66	F	Hematemesis	+	LMWH		Discharge	HYPERNTION	Act	PCR

Table 1: Demographic distribution of the patient. (ASA: acetyl salicylic acid; APT: antiplatelet therapy; LMWH: low molecular weight heparin. ACT; anticoagulant therapy. CT; cat scan. PCR; polymerase chain reaction; DM: diabetes mellitus. IHD; ischemic heart disease; Exp; lap exploration laparotomy.

DISCUSSION

The first case of covid 19 was discovered in Wuhan city in China at December 2019 as pneumonia of unknown cause during the spread of pandemic.¹³

the health provider notice that it affects all body organ without exception through the coagulopathy acute mesenteric ischemia is rare fatal condition that has had high incidence of mortality 60 to 80 % but in our study, we notice high mortality rate during the period of covid 19 than the period of non-covid.^{14&15}

The exact pathology that causes severe intestinal injury with ischemia not known exactly but some theories can explain this effect, the first explanation is the hypercoagulable state that induced by covid 19, endothelial injury and hypoxia that result from respiratory affection can cause mesenteric thrombosis at any vessels especially in small vessels

sub mucosal blood vessels lead to ischemic necrosis of the intestinal wall with the embolic effect other theory is the direct invasion of the endothelial by the virus covid 19 through binding with angiotensin converting enzymes 2expressing on the endothelium.^{16&17}

another theory is immune complex mediated vacuities e causing injury to the endothelium.¹⁸

elevated level of fibrinogen and factor VIII lead to hyper viscosity and extracellular thrombotic micro particles the final theory is long standing recumbence in the ICU for the covid 19 patients can causes stasis and predisposing for thrombosis.¹⁹

in our study most of the patient was admitted to ICU unit before getting AMI after infection of covid 19 patient get dehydrated and hemodynamically unstable also predisposed to thrombosis.

In our patient we expect the intestinal ischemia in hospitalized patient with vague gastrointestinal manifestation as nausea, vomiting, abdominal pain, diarrhea, abdominal distention either in patients presented with those manifestation in emergency room or patient hospitalized with this manifestation.

The comorbidity and mimic symptoms with other disease can mislead in diagnosis of mesenteric ischemia that why most of the cases are discovered late we depend on the computerized tomography in the diagnosis in previous reports decide that thrombosis of small sub mucosal vessels but during the time of covid in patient positive there is occlusion of big vessels.^{20&21}

In our study we notice predominance in male than female and diabetes is the common comorbidities than others, most of the patients underwent laparotomy and bowel resection, little number

managed with anticoagulant and thrombolytic due to unfitness to surgery.

The accurate result of AMI with covid 19 is difficult from this study as complete follow up and current status of patient has not reported there is limitation in the study.

CONCLUSION

In acute mesenteric ischemia it is important to understand its relevance in all patients with gastrointestinal symptoms the clinician should be aware about the hypercoagulability stat in covid 19 patient and uses of prophylactic anticoagulants in hospitalized patients should be considered to reduce the morbidity and mortality

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