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Predictor factor for inpatients mortality of peptic ulcer emergency surgery during COVID-19 pandemic

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Abstract

Background: In our last 2 months, we must face to the brand new condition which no medical centre has already really anticipated, the COVID-19 pandemic. As a new kind of pandemic, we should reschedule or must cancelled our elective gastrointestinal surgery. In some cases, like peptic ulcer complication such perforation and bleeding, emergency surgery would be still needed in this situation although it would increase the morbidity and mortality during this pandemic.

Methods: As our routine protocols, all patients whose will be need emergency surgery have been evaluated using rapid test for COVID-19. Acceptable level 3 PPE has been used. The risk factor for increasing post-operative morbidity and mortality would be recorded. All patients with peptic ulcer complication would be included, the patients which could not fit for emergency surgery during this study would be excluded.

Results: During the last 2 months period, 10 patients were included and evaluated on this study. 8 patients were man, 2 were women. 4 (40%) patients were > 60 years old and have cardio-pulmonary comorbid peri-operatively. The albumin level was > 2.5 mg/dL during emergency surgery. Inpatients mortality was found in 2 patients, all of those patients have been referred > 48 hours to the emergency department. The rest of patients were survived during this study with no more post-operative morbidity, the mean LOS was 8 days.

Conclusion: Delayed referral and cardio-pulmonary morbidity were the risk factors of inpatients mortality on emergency surgery of the peptic ulcer complication during COVID-19 pandemic.

Keywords: Risk factors, peptic ulcer complication, emergency surgery, COVID-19

Introduction

One of the common gastrointestinal emergency cases was peptic ulcer disease, in the era of better proton-pump inhibitors and H2 blocker drugs to control these ulcer makes promising treatment for peptic ulcer disease. The most common causes of peptic ulcers are infection with the bacterium *Helicobacter pylori* (*H. pylori*) and long-term use of aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) ^[1].

In some cases, there would not responses to these medical treatment and surgical option was needed. The most common complications of peptic ulcer disease which we could usually found in our clinical practice was perforation that led to become peritonitis and the other one was bleeding. These 2 complication was the one of the most common procedure of gastrointestinal emergency cases. It is reported that peptic ulcer disease may have short-term morbidity in up to 50% of patients and mortality in up to 30% respectively ^[1,2].

In this our current COVID-19 pandemic era, no medical centre worldwide really anticipated to this condition, lack of PPE was one of the most common problems, the other one was the kit-test for COVID-19. The Royal College of Surgeon recommended the level 3 PPE (personal protective equipment) for this such emergency gastrointestinal surgery and routine PCR-test for COVID-19, but in some centre that procedure could not be used routinely, like in our centre, we could performed rapid test for COVID-19.

Although the morbidity and mortality rate might be increases when we performed emergency gastrointestinal surgery during this pandemic, by universal precaution for safety procedure, we would evaluated the risk factors which play an important role on inpatients mortality of peptic ulcer surgery during this pandemic.

Methods

This is a retrospective cohort study, data was taken during our last 2 months (March until May 2020) when the COVID-19 pandemic has been started in our institution (Department of Surgery,

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Sebelas Maret University and Moewardi General Hospital, Surakarta, Indonesia). All patients whose will be need emergency surgery have been evaluated using rapid test for COVID-19. Acceptable level 3 PPE has been used during this procedure. The risk factor for increasing post-operative morbidity and mortality would be recorded. The albumin level, creatinine, liver function and time to emergency department would be reported on this study.

All patients with peptic ulcer complication (perforation or bleeding) would be included in this study, the patients which could not fit for emergency surgery during this study would be excluded.

Standard perioperative management was given to all the patients, Ampicillin Sulbactam was administered as therapeutic antibiotic during this study, blood culture was taken. Intravenous Paracetamol has been used for post-operative analgetics. Fast track protocols for post-operative period has been done.

Results

During our last 2 months, 10 complicated peptic ulcer diseases patients presented to emergency department with classical sign and symptoms of diffuse peritonitis due to perforation. The characteristic of the patients can be shown in table 1.

In this pandemic era, we found no patient came to emergency department within the first 12 hours, almost all those case has been referred after 12 hours from the tertiary hospital. The recorded criteria such as albumin level, creatinin and liver function shows there was no patients has includes in sepsis criteria according to the latest sepsis guidelines.

The inpatients mortality has been reported in 2 patients, both of them has normal albumin and creatinin level preoperatively but had delayed time referral (>48 hours) to the emergency department. The cause of death was post-operative cardiac complication on the first patients and the other was pneumonia on 4th post-operative days.

Table 1: Patients characteristic

Patient	Sex	Age	Albumin (g/dL)	Creatinine (mg/dL)	Liver function	Time referral (hours)	Inpatient mortality	Cause of death
1	Male	66	2.8	1.5	Normal	> 48	+	Cardiac
2	Male	62	2.5	1.2	Normal	24	-	
3	Male	26	2.8	1.0	Normal	12	-	
4	Female	57	2.6	1.2	N/A	12	-	
5	Male	67	3.0	1.4	Normal	24	-	
6	Male	65	2.6	1.2	Normal	> 48	+	Pneumonia
7	Female	58	2.5	1.3	Normal	24	-	
8	Male	50	2.7	0.9	Normal	24	-	
9	Male	55	2.4	1.2	Normal	12	-	
10	Male	49	2.8	1.4	Normal	12	-	

Discussion

There are four major complications of peptic ulcer disease (PUD): bleeding, perforation, penetration, and obstruction. Complications can occur in patients with peptic ulcer of any etiology. Despite improvements in the medical management and the lower overall incidence of PUD, there are conflicting data about the incidence of potentially life-threatening ulcer complications. There are important time trends embedded within this stable overall rate of complications: the dramatic decline in the prevalence of *Helicobacter pylori*; an increased use of non-steroidal anti-inflammatory drugs, and an increased rate of ulcer complications related to such drug use, especially in the elderly [2, 3]. According to our study, all of our patients have drugs (NSAIDs) related peptic ulcer complication, all patients come to emergency department with the classic signs and symptoms of peptic ulcer perforation, supported with free-air on the chest upright x-rays.

There were not enough data or studies that already published about the current recommendation and other option treatment for peptic ulcer complication especially in the COVID-19 pandemic era.

Current study which already published, usually compared the effectiveness of laparoscopic vs. laparotomy on this case, in this pandemic era, laparoscopic surgery might be has higher risk on viral transmission and increased the morbidity and mortality [3]. On our clinical practice, we prefer to performed laparotomy on this case and in this pandemic era for patients safety, also for the safety of our medical staff and paramedic staff in the OR.

Many factors have been claimed play an important role on the clinical outcomes during peptic ulcer surgery especially for peptic ulcer complication (perforation) [4]. Preoperative condition such as cardio-pulmonary co-morbid, low albumin

level, increased creatinine, increased liver function test and delayed time to emergency department would increase the morbidity and inpatients mortality during this procedure especially in this pandemic era.

The low albumin level (< 2.5 mg/dL) play an important role on post-operative complication during major gastrointestinal surgery, in this emergency scenario, the minimum albumin level has been tolerated for this procedure and the emergency surgery cannot wait for another delay time, although correction still needed during post-operative period.

During this COVID-19 pandemic era, the most common problem was the need of centralized medical centre to perform the safe procedure, lack of PPE was another problem in some country. The other problems that we should face are time referral delay to the emergency department and referral hospital. Some hospital would preferred to refer the emergency case, that's mean prolonged referral time has play an important role on increasing post-operative morbidity and inpatients mortality for this peptic ulcer emergency surgery.

On the other hand, peptic ulcer complication patient on stable haemodynamic and no sign of peritonitis would be managed conservatively; in some cases localized abdominal abscess could be managed by percutaneous abscess drainage to reduce the more invasive procedure during pandemic era [5].

During the increased pressures of these pandemic, it will be the most important was not to neglect self-care. Specifically, members of the surgical team should make an effort to make use of any support systems available locally, such as reaching out to mentors, peers, and colleagues. Senior clinicians should also be prepared and willing to help others who are struggling or distressed which can maintain the safety procedures for the patients and medical staff, so we can achieved better clinical

outcomes for our patients especially during this pandemic.

Conclusion

Although there has been reported the increases morbidity and mortality risk for emergency gastrointestinal surgery during COVID-19 pandemic, many factors has important role on the safety and successful procedure during this pandemic. Delayed referral and cardio-pulmonary morbidity were the risk factors of inpatients mortality on emergency surgery of the peptic ulcer complication during COVID-19 pandemic.

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Ethical approval

Already approved by ethical committee.

Consent

Verbal and written consent was obtained from the patients.

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