ORIGINAL ARTICLE

Comparison of features and outcomes of perforated peptic ulcer between Malaysians and foreigners

Kugan Vijian, MBBS*, Mahadevan Deva Tata, MS*, Kandasami Palayan, FRCS**

*Department of Surgery, Tuanku Ja'afar Hospital, Seremban, Negeri Sembilan, **International Medical University, Seremban, Negeri Sembilan

ABSTRACT

Background: Perforated peptic ulcers (PPU) present as serious surgical emergencies that carry high mortality and morbidity. Foreigners with PPU are also managed in our hospital setting. Their inclusion significantly alters the trend and pattern of PPU seen in Malaysia.

Aim: To compare per-operative and post-operative features and outcomes of perforated peptic ulcers between Malaysians and foreigners.

Material and Methods: This was an analytical cross-sectional study. All patients who underwent repair of perforated peptic ulcer disease during a 6-year period were included. 50 consecutive patients' records with perforated peptic ulcer were analysed. Data were collected from operation theatre database and hospital medical records. Chi square and t test were performed using SPSS statistical software.

Results: Total of 50 patients, of which 30 were Malaysians and 20 were foreigners. The mean age of Malaysian patients was 58.3 ± 15.2 years whereas the mean age for foreign patients was 30.3 ± 6.7 years, with foreign patients being significantly younger than local patients. Foreigners had significantly smaller ulcers with only 5% of them having ulcers more than 1cm while 36.7% of Malaysian patients had ulcers more than 1cm. Post-operative complications are significantly higher in Malaysian patients ($p<0.05$) with 40% of Malaysian patients and 10% of foreign patients developing post-operative complications.

Conclusion: Foreign patients are younger with significantly smaller perforated ulcers and better post-operative outcomes.

KEY WORDS:
Peptic ulcer, Perforated, Foreigners, Malaysia

INTRODUCTION

Perforated peptic ulcers (PPU) are life threatening conditions with mortality rates reaching 40%.[1] Smoking, helicobacter pylori (H. Pylori) and non-steroidal anti-inflammatory drugs (NSAIDs) use are among the important established risk factors for peptic ulcer disease and perforation.[2] The records of the occurrence of PPU in the West dates back to nineteenth century where perforations were mainly found in young women. As of the twentieth century, these perforations seem to affect middle aged men more often.[3] A case series conducted in Malaysia in 1982 described a male preponderance with gastric ulcers being encountered more often.[4]

A successful outcome following surgical treatment of a perforation depends largely on prompt recognition of the diagnosis, early resuscitation and early institution of the surgical management.[5] The most common post-operative complication experienced is pulmonary complications and wound infection.[6] As of all complications, these contribute to prolonged hospital stay, increased cost and subsequent morbidity and mortality in patients leading to debates on the most appropriate method of surgical treatment advised to treat peptic ulcer perforations.[7,8]

In Malaysia, the incidence of peptic ulcer disease varies among the major ethnics who consist of Malays, Chinese and Indians. Apart from its multiracial community, Malaysia also serves host to foreigners who visit for work and education purposes. The recent influx of migrants from countries such as Bangladesh, Vietnam, Myanmar and others gives rise to a new pattern of peptic ulcer disease in Malaysia. In 2013, there were 2.4 million migrants in Malaysia with the highest number being from Indonesia and Bangladesh.[9] In the Malaysian hospital setting, cases of perforated peptic ulcer consists of both local and foreign patients, hence making it imperative to include these non-local populations in studies to improve their validity and significance. The aim of this study was to compare the features and outcomes of perforated peptic ulcer between Malaysians and foreigners in Malaysia.

MATERIALS AND METHODS

This was an analytical cross-sectional study conducted in Tuanku Ja'afar Hospital. Tuanku Ja'afar Hospital is a 1022 bedded hospital under the Ministry of Health, Malaysia. It has 17 clinical specialties and provides healthcare services to the residents of Negeri Sembilan.

Sample population

This study involved all patients who underwent repair of perforated peptic ulcer disease during a 6-year period. Universal sampling was used and 50 patients' records with

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Corresponding Author: Kugan Vijian, No.10, Jln Bukit Mewah 20, 43000, Kajang, Selangor, Malaysia
Email: gunpop.kl@gmail.com

perforated peptic ulcer were included in our study from 2010 till 2015. Patient's whose records were not available and records with missing data were excluded from the study. From the total cases collected, 30 patients were Malaysians and 20 were foreigners. Patients who had undergone repair of perforated peptic ulcer were identified using operating theatre database. Hospital medical records and operative notes were then traced from the hospital records department. The foreign patients include patients from Bangladesh, Vietnam, Pakistan, Myanmar, Africa and Nepal. All the patients were foreign workers except for the African patient, who was a student.

Patients who were diagnosed with perforation were subject to either an open or laparoscopic repair. All patients received intravenous antibiotics and analgesics in addition to gastric decompression prior to surgical intervention.

End-Point
Primary end-points were post-operative complications in both groups. Secondary end-points were size of ulcers, location of ulcers and post-operative duration of stay in hospital.

Data collection and Analysis
The details extracted from the records included patient's age, gender, race, location of the peptic ulcer, duration from onset of symptoms till time of surgery, type of surgery, pre-operative status, post-operative duration of hospital stay, post-operative complication and patient mortality. The location of the perforation was determined intra-operatively with all perforations in the stomach termed as gastric. Post-operative complications included immediate inpatient and complications requiring readmission. Two patients required readmission within 14 days post-operatively and subsequent surgical management. Mortality was taken as death occurring within 30 days post-operatively. The two deaths that occurred in this study were at day 20 and day 11 post-operatively. Pre-existing mortality predicting scoring system such as the Boey and American Society of Anesthesiologists (ASA) score were taken into account in this study. Two Malaysian patients were excluded in view of ASA score of four and Boey score of three as these factors result in poor post-operative outcomes while a foreigner was excluded for incomplete data. From the 50 cases included, 31 patients had open repair and 19 had laparoscopic repair.

Data such as surgeons' experience were not included although it affects the post-operative outcome. The data were then compiled in Microsoft Excel and analysed using the SPSS software version 20.0 (SPSS Inc., Chicago IL). Frequency distribution table, bar charts, means and percentage were used for descriptive data. Chi-square, independent sample t-test, odds ratio and 95% confidence interval were calculated. P values of <0.05 were regarded as statistically significant.

RESULTS

The mean age of patients was 47.1 years with standard deviation of 18.6. 88% of patients were male. Malay and Chinese patients represented the highest ethnic group with 28% and 24% of the total sample respectively. The location of the ulcer was commonest at the pre-pyloric (68%). Of the total 50 patients, 62% underwent open repair and 38% underwent laparoscopic repair. The size of the ulcer in 72% of patients was less than 1cm. In 26% of patients it measures 1-2cm and in 2% of patients it measured more than 2cm. The mean duration from onset of symptoms till surgical intervention was 2 days with standard deviation of 1 day. The mean post-operative duration of hospital stay was 6 days. (Table I)

Table I: Socio-demographic and PPU characteristics (n=50)

Variables	Frequency (%)
Age (Mean ± SD)	47.1±18.6
Gender	
Male	44 (88)
Female	6 (12)
Ethnicity	
Malaysians	30 (60)
Malay	14 (28)
Chinese	12 (24)
Indian	4 (8)
Foreigners	20 (40)
Bangladeshi	8 (16)
Nepalese	6 (12)
Burmese	3 (6)
African	1 (5)
Pakistani	1 (5)
Vietnamese	1 (5)
Location of ulcer	
Duodenum	13 (26)
Gastric	37 (74)
Pre-pyloric	34 (68)
Antrum	1 (2)
Lesser curvature	1 (2)
Gastric unspecified	1 (2)
Type of Surgery	
Open repair	31 (62)
Laparoscopic repair	19 (38)
Size of ulcer	
Less than 1cm	36 (72)
1 to 2cm	13 (26)
More than 2cm	1 (2)
Pre-operative days (Mean ± SD)	2.06 ±1.07
Post-operative duration of stay (Mean ± SD)	6.08 ±4.30
Mortality	2 (4)
Boey score	
0	18 (36)
1	27 (54)
2	5 (10)
3	-
ASA	
1	34 (68)
2	12 (24)
3	4 (8)
4	-
5	16 (32)
Smoking	10 (20)
Dyspepsia	16 (32)
Alcohol	2 (4)

As shown in Table II, foreigners were found to be significantly younger and had smaller ulcers compared to Malaysians ($p<0.05$). The total post-operative complications were also significantly higher among Malaysians ($p<0.05$). The pre-operative status of both groups of patients showed significant difference in the ASA score whereas other factors such as smoking, presence of dyspepsia and the Boey score were similar in the two groups.

Table II: Baseline comparisons

Variables	Malaysians (n=30) Frequency (%)	Foreigners (n=20) Frequency (%)	P
Age (Mean ± SD)	58.3 ± 15.2	30.4 ± 6.7	<0.01*
Gender			
Male	24 (80)	20 (100)	0.07
Female	6 (20)	0 (0)	
Location of Ulcer			
Duodenum	8 (27)	5 (25)	0.90
Gastric	22 (73)	15 (75)	
Type of surgery			
Open repair	17 (57)	14 (70)	0.38
Laparoscopic repair	13 (43)	6 (30)	
Pre-operative days (Mean ± SD)	2.2 ± 1.2	1.8 ± 0.8	0.23
Post-operative days (Mean ± SD)	6.0 ± 3.1	5.5 ± 4.7	0.63
Mortality	2 (7)	0 (0)	0.51
Size of Ulcers			
≤ 1cm	19 (63)	19 (95)	0.01*
> 1cm	11 (37)	1 (5)	
Total Post-op complications	12	2	0.03*
Intestinal complications (Prolonged paralytic ileus, adhesions, intra-abdominal collection, suture leak)	5 (36)	2 (67)	0.69
Lung complications (Pneumonia, respiratory failure)	8 (57)	1 (33)	0.67
Surgical site infection	1 (7)	0 (0)	1.00
Boey score			0.61
0	10 (33)	8 (40)	
1	16 (53)	11 (55)	
2	4 (13)	1 (5)	
3	-	-	
ASA			<0.01*
1	14 (47)	20 (100)	
2	12 (40)	0 (0)	
3	4 (13)	0 (0)	
4	-	-	
5	-	-	
Smoking	7 (23)	3 (15)	0.72
Dyspepsia	11 (37)	5 (25)	0.54
Alcohol	1 (3)	1 (5)	1.00

* Significant difference (p<0.05)

Table III: Type of repair for different ulcer sizes

Variables	Open repair (n=31) Frequency (%)	Laparoscopic (n=19) Frequency (%)	P
Ulcer size			0.10
≤ 1cm	21 (68)	17 (90)	
> 1cm	10 (32)	2 (10)	

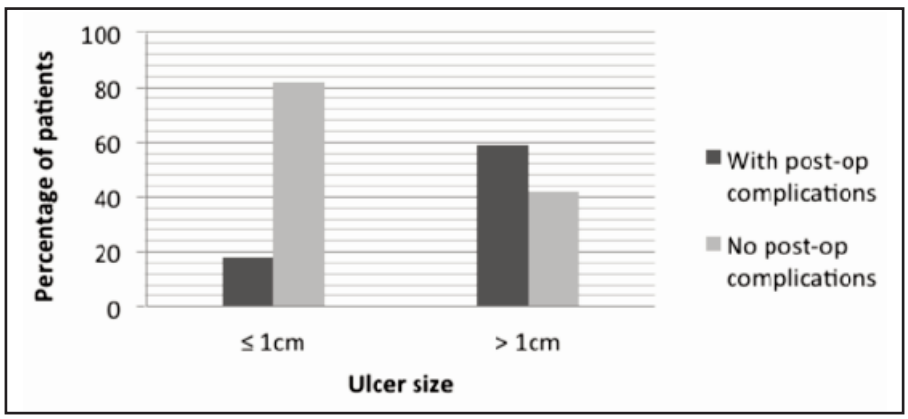

Fig. 1: Size of ulcers and post-operative complications. Post-operative complications are significantly higher in larger ulcers, p=0.02 (p<0.05).

Our analysis also demonstrated a significantly higher rate of post-operative complication in ulcers more than 1cm (Figure 1).

Table III shows no significant difference between the types of surgery used for different ulcer sizes.

DISCUSSION AND CONCLUSIONS

In this 6-year retrospective study, we were able to demonstrate that the features and outcomes of PPU between local and foreign patients differ significantly. Foreign patients were significantly younger than Malaysian patients with significantly smaller ulcer sizes. Post-operative complications were also significantly reduced in foreigners compared to locals. We also found a significant association between larger ulcers and post-operative complications.

Overall, this study showed a predominance of male patients in their fifth decade of life, consistent with other similar studies in developing countries.[10,11] Although an underestimation of the age group could be present due to the fact that foreigners in Malaysia are of a younger age group as they are usually working adults and students while the older age group of foreigners would migrate back to their country of origin. These factors would exclude the more elderly and susceptible from the foreigners' cohort. Nonetheless, it would be important to note that as of 2013, 140,000 of foreigners were of 60 years and older.[12]

This pattern of young foreign male patients bears somewhat close resemblance to the patients seen in the West during the nineteenth century where young men with perforations presented more often compared to the recent years where elderly patients, both male and female present with mostly pre-pyloric perforations.[9] A case series of 72 patients in Malaysia in 1982 showed that males were more prone for perforations with gastric perforations seven times more common than duodenal ones4 consistent with findings in current study. These patients, though in the same temporal relation as the patients in the West, seem to have a different pattern of perforation.

Our study also showed patients being affected by gastric ulcers more than the duodenum, agreeable to multiple articles written in the West.[9,13] However, certain studies in developing countries have indicated a higher incidence of duodenal ulcers.[10,11] There was no significant difference between the site of perforation between foreigners and Malaysians. Evidence point towards gastric ulcer being associated with larger ulcer sizes and higher mortality rate.[14,15] Larger ulcer perforations were also found to cause more peritoneal contamination, directly contributing to increased mortality rate.[9] These variables could be associated as smaller ulcer sizes and young age group has been evidently linked with better outcome.[1,11,12] The advent of laparoscopic surgery has been proven to be helpful in minimizing the adverse outcomes associated with the conventional repair. Multiple studies has proven laparoscopy to be superior in terms of shorter duration of hospital stay and reduced post-operative pain.[16] The use of laparoscopic repair in Malaysia still lacks behind many developed countries. Our study showed that almost half (55%) of ulcers sized 1cm and less were still repaired through the open method.

Our study demonstrated significant difference between ASA scoring between the two groups but Boey scores, history of smoking, dyspepsia or alcohol consumption were similar. In this study we observed that Malaysian patients tend to have higher ASA scores due to underlying comorbidities such as diabetes and hypertension, which were not so prevalent among the foreign patients. This study also looked into the time from onset of symptoms till surgical intervention (pre-operative days) and length of hospital stay post-operatively (post-operative days). Delayed initiation of surgical intervention has been shown to adversely affect patient outcomes with some literature stating that operation after 12 hours from onset of symptoms would increase mortality and post-operative complication rates which subsequently results in prolonged length of hospital stay.[17,18,19] The mean time till onset of surgery in this study was 2 days which could be a consequent of late presentations to the hospital or difficulty in establishing diagnosis. The mean length of hospital stay post-operatively was 6 days, which resulted from certain patients who developed post-operative complications. A large number of patients (68%) underwent open repair, also a likely contributor to the increased length of hospital stay.

A number of limitations ought to be brought up in this study. First and foremost, as the nature of the study is retrospective, many factors could not be determined pre-operatively, namely environmental risks, working conditions or the H. Pylori status. Only a very limited number of the sample has undergone previous endoscopy. The history of alcohol consumption and smoking may have also been underrepresented as some data may not have been documented or missed during the patient interview. As the sampling was not randomised, bias may be present as well.

In the current hospital settings, foreign patients make up for a significant proportion of patients. Our study showed that 40% of PPU cases in the 6-year period were foreigners with Bangladeshi patients making up 16% of these cases, even higher than the ethnic Indians in Malaysia. In summary, foreigners in Malaysia when compared to local patients seem to fare better in terms of post-operative outcomes, although the difference in mean duration of hospital stay remains insignificant. Further studies have to be undertaken to determine the difference in environmental factors, living or working conditions and incidence of H. Pylori in both foreigners and Malaysians. Tackling the bigger picture involves measures to identify, treat and prevent the etiological factors mainly through endoscopic services, large-scale eradication therapies and smoking cessation programs.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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