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ORIGINAL ARTICLE

Association of peptic ulcer perforation with Ramadan related lifestyle modifications.

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ABSTRACT… Objective: To look into the relationship of Ramadan with peptic ulcer perforation. This will include assessing the effect of fasting as well as other Ramadan related factors like changes in eating and smoking habits. **Study Design:** Retrospective Analysis. **Setting:** Three Tertiary care hospitals of Peshawar i-e Hayatabad Medical Complex, Khyber Teaching Hospital and Lady Reading Hospital. **Period:** 6th May 2019 to 26th May 2020. **Material & Methods:** Patients presenting with the aforementioned complication of peptic ulcer during the research period were divided into two groups. Patients presenting during the two Ramadan months were designated as cases (Group 1). While those presenting during the rest of the period i-e 11 months, were the controls (Group 2). So comparison of these groups was done on basis of various predisposing factors of the disease. Inferences were drawn by applying Student's t, Chi-square and Fischer's exact chi-square tests. **Results:** A total of 129 patients were considered. Among these, 36 were cases (Group 1) and 93 were controls (Group 2) as per our study design. Number of perforations per month were statistically higher in Group 1 in comparison to Group 2 (i-e 18 patients per month vs 8.4 patients per month, $p<0.05$). Patients with dyspepsia and preference for fried food were significantly higher in Group 1 ($p<0.001$ and $p=0.022$ respectively). Whereas smoker were significantly lower in Group 1 ($p=0.048$). **Conclusion:** Analysis concluded that the incidence of perforation is higher during the Ramadan. Since Ramadan is not only about fasting, and it affects eating and smoking habits, this rise in rate of perforations can be considered to be an interplay of such changes and the complication of peptic ulcer.

Key words: Gastric Perforation, Peptic Ulcer Perforation, Risk Factor.

INTRODUCTION

Fasting during month of Ramadan has been a common practice among Muslims. In recent times concept of intermittent fasting is becoming a norm among young generation. During Ramadan common practice among Muslims is to have two heavy meals, one at beginning and other end of day, with fasting period in between. The relationship between time restricted food and water intake to gastric pH, plasma gastrin level has been studied previously.[1,2] Certain significant metabolic changes noted during fasting include rise in serum thyroxine, uric acid, cholesterol but no change in gastrin and insulin level.[3] There has been a debate if patient with active duodenal ulcer can fast during Ramadan.[4,5] A study conducted in India by Malik et al. advocated that fasting might prove hazardous to patient with active peptic ulcer disease[6], while others believe that fasting can be observed safely in these patients.[7]

Etiology of peptic ulcer perforation is not clearly understood but known facilitating factors include smoking, alcohol, non-steroidal anti-inflammatory drugs (NSAIDs) and Helicobacter pylori.[8,9] Where most perforations are attributed to smoking alone in people less than 75 years patients.[8] Since lining of upper gastrointestinal tract is exposed to irritant effect of food, certain food types are prohibited for peptic ulcer patients. These include fried food and peppers[10], but excessive consumption of fried food is common among our people especially during Ramadan.

Therefore the aim of this study is to look into the relationship of Ramadan with peptic ulcer

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perforation. This will include assessing the effect of fasting as well as other Ramadan related factors like changes in eating and smoking habits

MATERIAL & METHODS

This is a retrospective analysis of patients who underwent emergency laparotomy for perforated peptic ulcer disease at any of the three Tertiary care hospitals of Peshawar i-e Hayatabad Medical Complex, Khyber Teaching Hospital and Lady Reading Hospital. Research period extended from 6th May 2019 to 26th May 2020. Approval for the project was taken from each of the hospitals (222/ED/HMC). All the patients were above 15 years of age and both genders were included. Those with history of CRF, cirrhosis, immunosuppressant use and malignancy were excluded.

Study population was divided into two groups. Group 1 included patients who were operated for peptic ulcer perforation during Ramadan. Whereas, Group 2 were patients operated in months other than Ramadan. Proforma containing spaces for patient's demographic details and clinical data relevant to the research parameters was designed. These were filled for each patient included in the study by a trained research assistant, only after taking their consent. Patients were asked regarding comorbidities including hypertension, diabetes and Chronic Obstructive Pulmonary disease. History of predisposing factors i-e dyspepsia, smoking and NSAID use was also taken. H pylori status was decided on the histopathology results of biopsy taken from site of perforation during the surgery. Whereas to gauge the consumption of fried food, patients were asked whether or not they prefer fried food.

Statistical analysis was done using SPSS (Statistical Package for Social Sciences) 23 for Windows 10. Categorical data was presented as percentages and were analyzed by Chi-square and Fischer's Exact Chi-square test. While continuous data was presented with measures of central tendency and dispersion and student's t-test was applied for analysis.

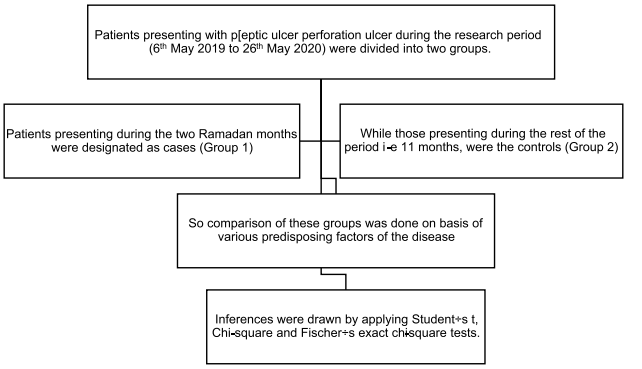

Figure-1. Recruitment algorithm

RESULTS

A total of 129 patients presented with peptic ulcer perforation during the study period. Mean age of the sample was 44.33 ± 14.38. Majority of the sample was constituted by males i-e 111 (86%) while only 18 (14%) were females. Out of these 36 presented during the two Ramadan months so they were included in Group I (cases). Rest i-e 93 patients came in during the rest of study period so they were included in Group II (controls). Mean of cases per month in Group I was 18, that is statistically higher ($p<0.05$) than the mean of Group II which was 8.4 as shown in Table-I. On application of Student's t-test there was no significant difference among the means of the two groups ($p=0.16$). 72.2% of Group I were males that were significantly lower than 85% value noted in Group II ($p=0.005$) as depicted by Table-II.

Patients were asked for their comorbidities that included Hypertension, Diabetes and Chronic Obstructive Pulmonary Disease. Patient with any of these were designated concomitant disease positive while separate analysis for each of the aforementioned conditions was also performed. None of the observed counts were statistically significant on either Chi-square or Fischer's Exact Chi-square as summed up in Table-III (Concomitant diseases $X^2=2.25$ $p=0.13$. Hypertension $p=0.218$, >0.05. Diabetes $p=0.264$, >0.05. COPD $p=0.31$, >0.05).

	Group I	Group II	Total	P
Number of cases	36	93	129	<0.05*
Mean of cases per month	18	8.4	9.92	

Table-I. Distribution of surgeries per month. Statistically significant p value is bold.
*** Chi-square test**

	Group I (n=36)	Group II (n=93)	P
Age (mean ± SD)	41.5 ± 14.69	45.4 ± 14.18	0.16§
Gender			
Males [n (%)]	26 (72.2)	85 (91.4)	0.005*
Females [n (%)]	10 (27.8)	8 (8.6)	

Table-II. Demographics of the groups. Statistically significant p value is bold
*** Chi-square test. § Student's t-test**

	Group I (n=36)	Group II (n=93)	X^2 Chi-square	P
Concomitant Diseases [n (%)]	10 (27.8)	11 (11.9)	2.25	0.13
Hypertensive [n (%)]	4 (11.1)	4 (4.3)	0.218¥	>0.05
Diabetic [n (%)]	4 (11.1)	5 (5.4)	0.264¥	>0.05
COPD [n (%)]	2 (5.6)	2 (2.2)	0.310¥	>0.05

Table-III. Concomitant diseases in the patients
¥ Fisher's Exact Chi-square test

	Group I (n=36)	Group II (n=93)	X^2 Chi-square	P
Predisposing factors [n (%)]	33 (91.7)	76 (81.7)	1.96	0.162
Dyspepsia [n (%)]	27 (75)	28 (30.1)	21.38	<0.001
NSAID use [n (%)]	10 (27.8)	28 (30.1)	0.068	0.795
H. pylori [n (%)]	31 (86.1)	76 (81.7)	0.354	0.552
Smoking [n (%)]	12 (33.3)	49 (52.7)	3.90	0.048
Preference for Fried food [n (%)]	29 (80.6)	55 (59.1)	5.24	0.022

Table-IV. Predisposing factors for peptic ulcer perforation
Statistically significant p value is bold

Data regarding presence of four predisposing factors showed thatat least one of them was present in 91.7% of Group I patients though it was significantly higher than 81.7% that was noted in Group II (X^2=1.96, p=0.162). Similarly NSAID usage and presence of Helicobacter pylori didn't show any significant difference among the two groups (X^2=0.068, p=0.795 and X^2=0.354, p=552 respectively). Though smokers were definitely less in the case (Group I) than the controls (Group II) with X^2=3.90 and p=0.048. While the opposite was true for dyspepsia and preference for fried food, as both of these variables were significantly common in perforations during Ramadan (Group I) than non-Ramadan (Group II). Values reported by Chi-square test for these variables were X^2=21.38, p<0.001 and X^2=5.24, p=0.022 respectively.

DISCUSSION

Fasting for long hours affects the normal physiology of gastrointestinal tract. It definitely has an impact on gastrointestinal diseases especially if it is accompanied with two heavy unhealthy meals that is kind of a routine in our society during ramzan. The exact mechanism of Ramadan effecting peptic ulcer disease is difficult to establish because this requires a detailed knowledge of physiological changes that occur in a human body during a fast. Studies conducted previously on the topic have shown different results.[11,12] One definitely known fact is that the usage of potent drugs like proton pump inhibitors and H2-receptor inhibitors, and guidelines to eradicate H. pylori have greatly decreased the morbidity of the disease. But unfortunately these advancement haven't led to any decline in the peptic ulcer perforation rates. Though the morbidity and mortality of this grave

complication has definitely declined in twentieth century because of advancements in surgical care.[13] So there has been a debate if patients with active duodenal ulcer can fast or not.[4,5] A study conducted earlier in India by Malik et al. advocated that fasting might prove hazardous to patients with active ulcer disease so they better not fast.[6] While a more recent and advanced project indicated that fasting is not risky even in a patient with active ulcers. Endoscopic surveillance in this study showed promising cure rates of 94% in fasting and 95.5% in non-fasting populations of both gastric and duodenal ulcer including those with active bleeds.[14] Another prospective research concluded that duodenal ulcer patients treated with lansoprazole might fast without any risk.[7]

Aim of this project was to look into the relationship between Ramadan and peptic ulcer perforation. Focus was not only on impact of fasting but on role of various cultural norms that are associated with the holy month. In our sample more than 80% affected were men though this male dominancy was significantly lower among the Ramadan group (cases), which is in accord with previous studies.[15] This can be an incidental finding because of considerable fewer women affectees or perhaps women are more prone to ulcer perforation as Donderici et al. concluded previously.[16] Another possible explanation could be derived by comparing this finding with the data collected regarding smoking status of the study population. Smokers were significantly less in Ramadan group. This can be because males that get peptic ulcer disease because of their smoking habit decrease the amount of tobacco they smoke during Ramadan. Thus overall incidence of peptic ulcer perforation in males is considerably decreased. Analysis of data collected on comorbidities including Diabetes, Hypertension and COPD did not show any significant differences individually or collectively. While patients with chronic liver or renal disease were not included in the sample.

Inferential analysis of data regarding predisposing factors for peptic ulcer disease showed no significant difference among the groups in terms of NSAID use or H. pylori infection. Whereas smokers were significantly less among the patients who perforated during Ramadan. This seems to be a very significant finding which might be because of the fact that with avoidance of smoking throughout the fast, upper gastrointestinal lining is less exposed to the irritants of smoke as discussed previously as well. Thus mores research is warranted to approve or disapprove this hypothesis. On the other hand patients that had complaint of dyspepsia and those who prefer fried food were significantly higher in the Ramadan group. Thus preexisting dyspepsia and possible heavy consumption of fried food can be risk factors for perforation in this group. This can be a considerable factor in a society where consumption of heavy fried meals at start and end of fast (aftaars and sehris) is fairly common.

CONCLUSION

In conclusion, rate of peptic ulcer perforation is significantly higher during the Ramadan. Patient with history of dyspepsia are at relative risk of developing this complication, so workup and treatment of dyspepsia should be done prior to fasting. Similarly our lifestyle habits like excessive consumption of fried food may also play a role in increasing the risk of this complication. While abstinence or at least decrease in tobacco smoking during the holy month might have a protective effect.

But this study had limitations like it evaluated a specific subgroup of Muslims. Whereas fast is observed in Ramadan by more than one billion Muslims throughout the worlds, with each subgroup having their own different lifestyles and environmental factors affecting them. Also Ramadan completes its progression around the solar calendar in around 36 years period so an all seasonal analysis would take such a long study period.

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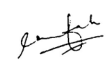
AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Attiya Nasir Siddique	Jointly proposed the study, analysed data & preparataion the final draft.	
2	Muhammad Usama	Jointly proposed the study, analysed data & preparataion the final draft.	
3	Sophia Asif Khan	Contributed to data collection, study design & interpretation of the study.	
4	Muhammad Umer Faheem	Contributed to data collection & interpretation of the study.	
5	Hizbullah Riaz Ansari	Contributed to preparation & proof reading of the draft.	
6	Muhammad Naveed	Contributed to the preparation & proof reading of the draft.