The Effects of Ramadhan Fasting on Clinical Symptoms in Patients with Gastroesophageal Reflux Disease

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ABSTRAK

Tujuan: *mengetahui pengaruh puasa Ramadhan terhadap keluhan GERD.* ***Metode:*** *subjek penelitian ini dikelompokkan menjadi kelompok berpuasa Ramadhan (n=66) dan kelompok tidak berpuasa Ramadhan (n=64). Evaluasi dilakukan antara kedua kelompok tesebut, dan antara bulan Ramadhan dengan di luar bulan Ramadhan pada kelompok berpuasa. Evaluasi dilakukan dengan menggunakan kuesioner GERD (GERD-Q) dalam bahasa Indonesia.* ***Hasil:*** *pada kelompok yang berpuasa Ramadhan, terdapat perbedaan median nilai GERD-Q yang bermakna secara statistik (nilai p<0,01) antara bulan Ramadhan dengan nilai median 0, dan di luar bulan Ramadhan dengan nilai median yang meningkat menjadi 4. Sementara itu, bila dilakukan analisis untuk membandingkan median nilai GERD-Q antara kelompok yang berpuasa Ramadhan dan tidak, juga didapatkan perbedaan yang bermakna (nilai p<0,01).* ***Kesimpulan:*** *pada subjek yang menjalani puasa Ramadhan, keluhan GERD dirasakan lebih ringan saat menjalani puasa Ramadhan dibandingkan di luar bulan Ramadhan. Di bulan Ramadhan, keluhan GERD lebih ringan dirasakan oleh subjek yang menjalani puasa Ramadhan dibandingkan subjek yang tidak menjalani puasa Ramadhan.*

Kata kunci: *penyakit refluks gastroesofageal, gastro-esophagealreflux disease, GERD, Ramadhan.*

ABSTRACT

Aim: *to determine the effects of Ramadhan fasting on GERD symptoms.* ***Methods:*** *a total of 130 GERD patients participated in this study. Patients were divided into two groups, i.e. those who performed Ramadhan fasting (n=66), and those who did not perform Ramadhan fasting (n=64). The evaluation was done using Indonesian version of GERD questionnaire (GERD-Q) between the two groups, and between Ramadhan month and non-Ramadhan month in the Ramadhan fasting group.* ***Results:*** *there was a statistically significant difference (p<0.01) in the median of GERD-Q score in Ramadhan-fasting group subjects and non-Ramadhan-fasting group subjects (0 vs. 4). Moreover, a statistically significant difference (p<0.01) was also found in the median of GERD-Q score in Ramadhan-fasting group subjects and non-fasting group subjects (p<0.01).* ***Conclusion:*** *subjects in Ramadhan fasting group, GERD symptoms experienced less severe during fasting month (Ramadhan) than non-fasting month. During Ramadhan month, GERD symptoms were also milder in Ramadhan fasting group than those in non-fasting group subjects.*

Keywords: *gastroesophageal reflux disease, GERD, Ramadhan, islamic fasting.*

INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is a commonly found disease in the population. A systematic review study by El-Serag, et al.[1] found that the prevalence of GERD is estimated to be 18.1-27.8% in North America and 2.5-7.8% in Eastern Asia and the rate was increasing in the past decades.[1,2] GERD itself is defined as gastrointestinal dysfunction, in which the stomach content is refluxed periodically into the esophagus and causes disturbing symptoms.[3-5] The most commonly used modalities for GERD symptoms evaluation is GERD questionnaire (GERD-Q), which has been translated into multiple languages including Indonesian.[6-8] GERD symptoms can be induced and exacerbated by several factors such as obesity, smoking habit, alcohol consumption, intake of certain food and drinks and certain dietary pattern.[9-15] These factors that affect GERD can change when one is fasting during Ramadhan.

By definition, fasting means withholding oneself from certain actions such as eating, drinking, smoking, having sexual intercourse, voluntary vomiting, etc. from dawn until sunset for the whole month of Ramadhan. Ramadhan fasting, which lasts approximately 30 days, causes physiological changes. In a study conducted by Iraki et al.[16] there was reduced mean of stomach pH in fasting period compared to the non-fasting period in patients who had performed Ramadhan fasting over 10 days.

However, during Ramadhan fasting, actually the individual does not fast for the whole day as there are periodic meals. The meals are time bound, i.e. one before dawn and one after sunset; therefore, when fasting, there is a regular meal pattern. Moreover, during Ramadhan fasting, there is a change in smoking habit and alcohol consumption. Until now, we do not know for certain about the GERD symptoms experienced by the patients during fasting. Our study was aimed to identify the effects of fasting on GERD complaints.

METHODS

This was a longitudinal study with consecutive sampling method. The evaluation was performed on the 4th week of Ramadhan and 3 months after. Our study had obtained Ethical Approval from the Ethical Committee on Health Research, Faculty of Medicine, University of Indonesia Number 232/UN2.F1/ETIK/2016.

Subjects

The inclusion criteria for this study were patients aged over 18 years old and had been diagnosed with GERD; while the exclusion criteria were those who refused to participate in the study. Subjects were subsequently categorized into the fasting and non-fasting groups.

GERD Complaints

GERD complaints were evaluated using the GERD-Q, a GERD questionnaire, which consists of 6 questions and each question has 4 choices of answers with scores of 0-3 for each question.

Statistical Analysis

The study results were managed electronically using SPSS software (Statistical Product for Social Science)© version 16.0. Paired data analysis was performed using Wilcoxon test; while non-paired data was managed using Mann-Whitney test. Data was reported in median and interquartile range since the data could not be reported as a normal distribution.

RESULTS

Subject Characteristics

The study was conducted between July and October 2015 with an objective to evaluate GERD complaints during Ramadhan (July 2015) and non-Ramadhan period (October 2015). The subject recruitment algorithm is shown in **Figure 1**. About 130 subjects participated in the study and 66 of them were fasting during Ramadhan; while the remaining were those in the non-fasting group.

Most subjects in both groups were male and the median age was 53 years. In both groups, the majority of subjects were not obese and the number of obese subject was less than 10% in each groups. The most common diagnosis in both groups was non-erosive reflux disease (NERD).

In the fasting group, there was a statistically significant difference on median GERD-Q score

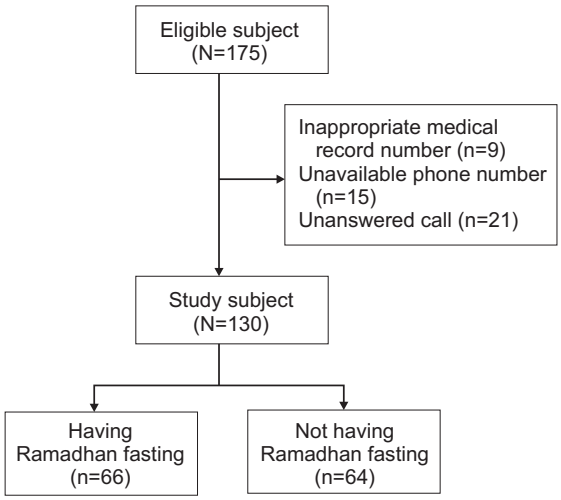

Figure 1. The algorithm of subject recruitment

Table 1. Subjects' characteristics

Characteristics	Ramadhan fasting group (n=66)	Non-ramadhan fasting group (n=64)
Sex, male, n (%)	51 (77)	45 (71)
Age, median (minimum-maximum)		
Age	53 (20-75)	53 (18-81)
Body mass index, n (%)		
- Non-obese	64 (97)	61 (95)
- Obese	2 (3)	3 (5)
Diagnosis, n (%)		
- NERD	38 (58)	41 (64)
- Esophagitis A	19 (28)	13 (20)
- Esophagitis B	8 (12)	8 (13)
- Esophagitis C	1 (2)	2 (3)
Smoking habit during Ramadhan, n (%)		
- No smoking	55 (83)	44 (69)
- Smoking	11 (17)	20 (31)
Smoking habit after Ramadhan, n (%)		
- No smoking	45 (68)	53 (83)
- Smoking	21 (32)	11 (17)

($p<0.01$) between Ramadhan with a median value of 0 (interquartil range: 0-2) and non-Ramadhan period with an increased median value of 4 (interquartil range: 2.75-5.25). Meanwhile, when analysis was performed to compare the median of GERD-Q between the fasting and non-fasting group, there was also a significant difference ($p<0.01$) with median value of 0 (interquartil range: 0-2) in the Ramadhan fasting group and a median value of 2 (interquartile range: 0-5) in the Ramadhan non-fasting group.

In our study, we had determined that the difference in GERD-Q values was considered significant when the difference of GERD-Q value between non- and during Ramadhan period was ≥ 3. As many as 15 subjects in the fasting group had a difference on GERD-Q score of more than 3 points between Ramadhan (lower GERD-Q scores) and non-Ramadhan (higher GERD-Q scores) period.

However, not all subjects experienced changes of GERD-Q scores between and non-Ramadhan period. There were as many as 9 subjects in the fasting group who did not have altered GERD-Q scores and 2 subjects actually had improved GERD-Q scores in non-Ramadhan period.

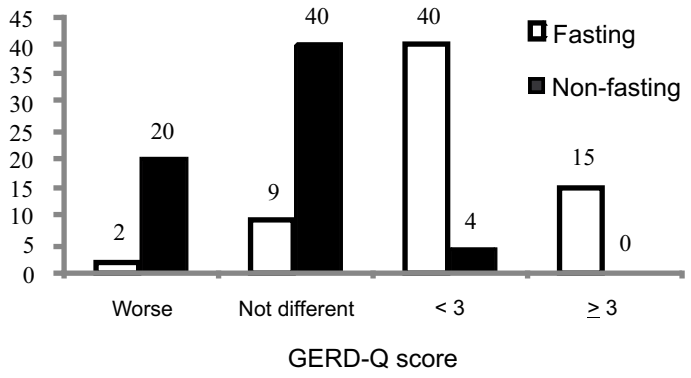

Figure 2. Comparison on the number of subjects who experienced altered GERD-Q score between Ramadhan fasting group and non-fasting group

DISCUSSION

The reduction of smoking habit during Ramadhan can decrease GERD complaints. However, the shortened interval between the last meal and before sleep can increase the risks of developing GERD. Altered GERD-Q scores during Ramadhan compared to non-Ramadhan period as shown in our study will give clinical implications since it can convince patients to keep doing Ramadhan fasting without any harm.

In the Ramadhan fasting group, there was a difference on median of GERD-Q scores between Ramadhan and non-Ramadhan period, in which the median was 0 (lower) in Ramadhan period compared to the median of 4 (higher) in non-Ramadhan period. The significant increase of GERD-Q score in non-Ramadhan period compared to Ramadhan period in subjects who were in the fasting group is clinically important as it can convince patients to fast during Ramadhan.

Meanwhile, when we carried out an analysis to compare the median of GERD-Q score between fasting and non-fasting group, we found a significant difference ($p<0.01$) with median of 0 (lower) in the fasting group and median of 2 (higher) in the non-fasting group. The result may also convince patients with GERD that they are still able to perform Ramadhan fasting.

Although in our study we had determined that the clinically significant altered GERD-Q score discrepancy is ≥ 3, basically a decrease of one point in GERD-Q score is actually significant for the patient. In the Ramadhan fasting group, there was a change of GERD-Q score in more than 55 subjects (83%) and 15 of them experienced a change of GERD-Q score of ≥ 3.

Previous studies[11-13,17-20] reported that smoking can induce GERD complaints and stop smoking can reduce GERD complaints. Our study also found that there was a statistically significant difference ($p<0.01$) in the number of cigarettes smoked between Ramadhan and non-Ramadhan period as well as between fasting and non-fasting group. During Ramadhan, the number of cigarettes smoked ranges from 0-6 cigarette(s) in the fasting group and 0-12 cigarette(s) in the non fasting group. However, there was an increase number of smoked cigarettes in non-Ramadhan month by the fasting group, which is 0-12 cigarette(s).

In addition to smoking habits, another factor which correlates with GERD symptoms is eating pattern. Previous studies on eating pattern demonstrated that a short interval between the last meal and sleeping is one of the most influencing factor in developing GERD.[9,12,13]

If someone who is fasting chooses to have a big meal after Isya prayer or tarawih, then he/she will have a closer interval between his/her last meal and sleeping. It may increase the risk of developing GERD complaint. However, in our study, we found no significant difference ($p=0.179$) regarding the interval between the last meal and sleeping during Ramadhan and non-Ramadhan period in the fasting group. Insignificant difference was also found when we performed analysis in both groups ($p=0.108$).

To confirm whether smoking is a confounding factor in improving GERD complaints during Ramadhan, further analysis was carried out by including only non-smoking subjects (both in Ramadhan and non-Ramadhan period). By using the analysis, we again found that the difference of GERD-Q score was statistically significant. Therefore, it can be concluded that smoking is not the only contributing factor to the change of GERD complaints.

Considering that there was no previous data about the months prior to Ramadhan in our study; therefore, we could not determine whether the two subjects who experienced improved GERD-Q scores in non-Ramadhan months were actually experienced more severe GERD complaints during Ramadhan. It is possible that the GERD complaints of both subjects before Ramadhan were even worse, which was getting better during Ramadhan and improved more afterwards. Nevertheless, our study also could not confirm the factors that lowered the GERD-Q scores in both subjects in non-Ramadhan month. Both subjects had no difference in smoking habit between during and non-Ramadhan months (both subjects were non smokers); there were also no differences in eating and sleeping habits. Both subjects also did not consume any alcohol. It is possible that there is another factor that can affect the change of GERD conditions in both subjects such as psychological

factors which has not been evaluated in our study.

In our study, there was no randomization since the subjects were categorized automatically into the fasting and non-fasting group. Therefore, the blinding to the intervention (in this case, the Ramadhan fasting) could not be performed because the subjects were fully aware whether he/she had fasting or not. Other than the difference on the intervention, subjects in both groups received equal treatment.

A significant difference in GERD-Q scores in the fasting group between during Ramadhan and the non-Ramadhan months is clinically important as it can convince patients with GERD to fast during Ramadhan. Our study was also conducted in GERD patients who had one whole month fasting at the outpatient clinic since most patients did not require hospitalization. However, considering the study results could not be presented in a normal distribution; therefore, the application of our results in general population must be done with great caution.

Our study limitation includes the absence of data prior to the Ramadhan month. It may occur since our study was only aimed to compare complaints between Ramadhan and non-Ramadhan months. Other factors that may become the limitation of our study are the absence of analysis on other factors that may affect GERD complaints such as psychological factor and the type of food consumed.

Nevertheless, to our knowledge, our study is the first study evaluating the effect of Ramadhan fasting on GERD complaints.

CONCLUSION

GERD complaints are milder in subjects who perform fasting during Ramadhan than non-Ramadhan month. Moreover, during Ramadhan, GERD complaints are less severe compared to those who do not perform Ramadhan fasting.

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