A prospective observational study of the disease profile of Muslim patients attending the outpatient department of internal medicine during Ramadan fasting season

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Abstract

**Background:** Ramadan is the fasting month of the Muslim calendar. There is a paucity of data on the prevalence of morbidity among those who visit the outpatient department of the hospital while observing the Ramadan fasting. **Materials and Methods:** The clinical profile of 61 Muslim patients who visited the outpatient department of the internal medicine of the specialty hospital during the holy Ramadan fasting season at Moodabidri, South India was collected. The diagnosis of all the medical conditions were classified according to the International Classification of Disease (ICD-10) coding system and the demographic profile and clinical data were analyzed. Analysis was done by using $X^2$ test. A statistical package SPSS vers.17.0 was used to do the analysis. $P<0.05$ was considered as significant. **Results:** It was observed that, majority of the patients were females, $n=38$ (61.7%) and most of them, $n=24$, (63.15%) belonged to the age group of 50 years and above. The diseases of the respiratory system (J00-J99) was found to be the most common ($n=25$, 40.32%) and the diseases of the digestive system (K00-K93) ($n=11$, 17.74%) was the second. Three most prevalent specific diseases for the entire study population as per the age and gender were lower respiratory tract infection ([LRTI] [J22]), ($n=15$, 24.19%) followed by dyspepsia (K30) ($n=10$, 16.12%) and bronchial asthma (J45) ($n=5$, 8.06%). **Conclusion:** This study emphasizes the need for a large global multicenter prospective study of the patients while observing Ramadan fasting, with a hope of getting an insight into the various life style diseases like diabetes, metabolic syndrome, dyslipidemia, obesity and systemic hypertension.

**Key words:** Ramadan fasting, outpatient department, prevalence of disease, Muslim patients

Introduction

Ramadan is the fasting month of the Muslim calendar and is a yearly religious ritual lasting for one month. Fasting during the month of Ramadan is one of the five holy pillars in the Islamic faith and is an obligation for all its followers. During this holy month, adult Muslims who are in good health voluntarily avoid eating food, consuming water and skip any sexual activity between dawn to sunset and exhibit better self-control. The feeding and water intake takes place from sunset to dawn. During this period there would be drastic changes in the type, timing of food intake and great disruption of sleep. Studies have shown that disruption of feeding and sleep schedules can adversely affect health by changes in the stress response system, immune system and circadian rhythm. During fasting, certain diseases can flare up while some may go into remission. There is very little data on the prevalence of morbidity among those who visit...
the outpatient department of the hospital while observing fasting during Ramadan. People generally avoid seeking medical advice and try to postpone their hospital visit during the fasting season with fear of disruption of their religious rituals while following the medical advice. The objective of this study was to assess disease pattern among Muslim patients visiting outpatient department of internal medicine of a secondary care hospital during the Ramadan fasting season.

**Materials and Methods**

**Study setting**

Outpatient department of internal medicine of a specialty hospital in Moodabidri, South India

**Inclusion criteria**

Muslim patients of all age groups and either sex who are observing the Ramadan fasting

**Exclusion criteria**

1. Muslim patients who are not observing the Ramadan fasting
2. Muslim patients who are reporting to the emergency department of the hospital
3. Muslim patients who were on medications which could produce dyspepsia

**Study design**

All the patients reporting to the outpatient of the department of internal medicine of Moodabidri, South India who have met the inclusion and exclusion criteria were included in the study. The study period was from 10 July 2013 to 7 August 2013 (Ramadan fasting days followed at Moodabidri, South India). Due approval was taken from the ethics committee of the hospital (F. No 01/EC/AHC/2011).

A total of 61 patients were included in the study; after obtaining due consent. Demographic data like age and sex of the patients were noted. A detailed medical history was recorded and thorough clinical examinations were carried out. This was followed by relevant investigations like assay for hematological parameters, metabolic workup, chest X-ray, ECG etc. as required for the diagnosis of the clinical problem. The diagnosis of all the medical conditions were made by the physician and was classified according to International Classification of Disease-10 (ICD-10) coding system. The demographic profile and the clinical data were analyzed. Analysis was done by using Chi square test. A statistical package, SPSS version 17.0 was used to do the analysis. P<0.05 was considered as significant. The patients who had presented with coexisting diseases were included in the tabulation of each of the diseases with which they were presented.

**Results**

Out of the total 61 patients, one patient was found to be having two disease conditions and is included under both disease categories in the study. The demographic profile of the patients studied is presented in table 1 as per age and gender. It is observed that, majority of the patients were females, n=38 (61.7%) and most of them, n=24 (63.15%) belonged to the age group of 50 years and above. Similarly, among the 24 male patients (38.7%), majority were (n=11, 45.83%) belonged to the age group of 50 years and above. Thus, a total of 35 patients (56.45%) were found, belonging to the age group of 50 years and above. However, this data was not statistically significant.

<table>
<thead>
<tr>
<th>AGE GROUPS</th>
<th>Frequency [n=62]</th>
<th>Males [n=24, 38.7%]</th>
<th>Females [n=38, 61.7%]</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-29 yrs</td>
<td>14[22.58%]</td>
<td>05[20.83%]</td>
<td>09[23.68%]</td>
<td>[X2=3.69 p=0.158] NS</td>
</tr>
<tr>
<td>30-49 yrs</td>
<td>13[20.96%]</td>
<td>08[33.33%]</td>
<td>05[13.15%]</td>
<td></td>
</tr>
<tr>
<td>50+</td>
<td>35[56.45%]</td>
<td>11[45.83%]</td>
<td>24[63.15%]</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence of major disease categories among the study population as per ICD-10 categories, overall and for males and females separately, is presented in table 2. Diseases of respiratory system (J00-J99) was most common (n=25, 40.92%) among the patients studied. Diseases of the digestive system (K00-K93) was the second most common disease group (n=11, 17.74%). Diseases of the respiratory system was also the most common disease category (n=19, 50%) among the female patients, whereas, those of the digestive system, was found to be the most common (n=8, 33.33%) among the males. All these data were found to be statistically significant (p=0.05 resp system, p=0.0187- digestive system).

Table 3 along with Fig A and Fig B presents three most prevalent diseases for the entire study
population as per the age and gender. Lower respiratory tract infection \[^{15}\text{LRTI}\] \[^{19}\text{J22}\] was found to be the most common medical condition \((n=15, 24.19\%)\) in the study population. Dyspepsia \(^{20}\text{K30}\) ranked second \((n=10, 16.12\%)\) and bronchial asthma \(^{21}\text{J45}\) was the third \((n=5, 8.06\%)\) most common condition. Dyspepsia, was found to be the most prevalent medical condition \((n=08, 33.33\%)\) among the males and LRTI was found to be the most common medical problem \((n=10, 26.3\%)\) among the females. Bronchial asthma \(^{22}\text{J45}\) was observed only among the female patients in our study. Further, all the three most prevalent disease conditions were found to be more common among the elderly patients belonging to the age group of 50 years and above. Once again, all these data were found to be statistically highly significant \((p=0.007)\).

Table 2: Prevalence of the major disease categories among the patients

<table>
<thead>
<tr>
<th>SR NO</th>
<th>Disease category</th>
<th>ICD NO</th>
<th>Total frequency ([n=62])</th>
<th>Males([n=24])</th>
<th>Females([n=38])</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diseases of the respiratory system</td>
<td>J00-J99</td>
<td>25 [40.32%]</td>
<td>6</td>
<td>25</td>
<td>00.05 sig</td>
</tr>
<tr>
<td>2</td>
<td>Diseases of the Digestive System</td>
<td>K00-K93</td>
<td>11 [17.74%]</td>
<td>8</td>
<td>33.33</td>
<td>0.0187 sig</td>
</tr>
<tr>
<td>3</td>
<td>Endocrine, Metabolic, Nutritional Diseases</td>
<td>E00-E90</td>
<td>8 [12.90%]</td>
<td>3</td>
<td>12.5</td>
<td>13.15 ns</td>
</tr>
<tr>
<td>4</td>
<td>Diseases of the Musculoskeletal System and Connective Tissue</td>
<td>M00-M99</td>
<td>3 [4.83%]</td>
<td>2</td>
<td>8.33</td>
<td>1.63 ns</td>
</tr>
<tr>
<td>5</td>
<td>Diseases of the Circulatory System</td>
<td>I 00-I99</td>
<td>3 [4.83%]</td>
<td>1</td>
<td>4.16</td>
<td>2.63 ns</td>
</tr>
<tr>
<td>6</td>
<td>Diseases of the Genitourinary System</td>
<td>N00-N99</td>
<td>3 [4.83%]</td>
<td>2</td>
<td>8.33</td>
<td>2.63 ns</td>
</tr>
<tr>
<td>7</td>
<td>Infective and Parasitic Disease</td>
<td>A00-B99</td>
<td>1 [1.61%]</td>
<td>1</td>
<td>4.16</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td>Mental Disorders</td>
<td>F00-F99</td>
<td>2 [3.22%]</td>
<td>0</td>
<td>0</td>
<td>2.63 ns</td>
</tr>
<tr>
<td>9</td>
<td>Diseases of the Nervous System and Sense Organs</td>
<td>G00-G99</td>
<td>2 [3.22%]</td>
<td>1</td>
<td>4.16</td>
<td>2.63</td>
</tr>
<tr>
<td>10</td>
<td>Diseases of the Skin and Subcutaneous Tissue</td>
<td>L00-L99</td>
<td>1 [1.61%]</td>
<td>0</td>
<td>0</td>
<td>1.63</td>
</tr>
<tr>
<td>11</td>
<td>Others</td>
<td></td>
<td>3 [4.83%]</td>
<td>0</td>
<td>0</td>
<td>3.89 ns</td>
</tr>
</tbody>
</table>

Figure A: Showing three most prevalent diseases according to sex
Naik B S, et al: Disease profile of Muslim patients during the Ramadan fasting season

Discussion

During the Ramadan fasting, there will be radical change in the lifestyle of a patient. These changes in the lifestyle, can adversely affect the health. We are of the belief that this the firsts of its kind study describing the patterns of disease prevalence among the Muslim patients visiting the internal medicine outpatient department of a hospital while observing the Ramadan fasting. However, the study population is small but this limitation is due to the fact that, Muslims are a minority religious community at Moodabidri where the study was undertaken. Extensive search of the available medical literature did not show any studies on the prevalence of diseases among the Muslim patients attending the outpatient department of internal medicine during the Ramadan fasting season, so as to compare our study observations.

However, a study done at Turkey to determine the impact of Ramadan on demographics and frequencies of disease related visits in the emergency department found higher visit frequencies for hypertension and uncomplicated headache in Ramadan than in non-Ramadan months. They also found that, more young diabetics turning up to the hospital than the elders in the rest of the year. They did not find any increase in the prevalence of other diseases during the Ramadan fasting in the study.

Our study showed LRTI, dyspepsia and bronchial asthma as the three most prevalent disease conditions for which patients turned up to the outpatient department of the hospital. Surprisingly, those who presented with bronchial asthma were only females. The increased incidence of bronchial asthma in our study could be due to the reluctance of the patients to use bronchodilators during the fasting hours. Several reports and studies have shown an increased incidence of acute exacerbation of bronchial asthma especially due to stoppage of medications. On the contrary, Bener A et. al. in their population based study found no significant differences in hospital...
admissions and mean spirometric values for asthma in the month of Ramadan when compared to the non-fasting season.

Kucuk HF et. al.⁶ in their study, observed an increased incidence of duodenal ulcer perforation during Ramadan fasting and cautioned patients with dyspepsia to take special care while observing Ramadan fasting. Similarly, El Mekkaoui Amine et. al.⁷ found that, peptic ulcer as the most frequent cause of acute upper gastrointestinal bleed during the Ramadan fasting. In another study, Gokakin AK et. al.⁸ also found an increased incidence of duodenal ulcers and duodenitis during the Ramadan month. We found that, dyspepsia as the second most prevalent medical condition in our study and male patients seem to have affected by this as compared to the females. Ramadan fasting increases the gastric acidity over 24 hours and it is more in the daytime. Gastric acidity peaks at the end of the fasting period. Hence, the patients with pre-existing duodenal ulcers run a higher risk of complications during the month of Ramadan than the rest of the year.⁹

Salim I et. al.¹⁰ in their systematic review about the impact of religious Ramadan fasting on cardiovascular diseases found no change in the incidence of acute cardiac illness in the cardiac patients while observing fasting. A similar result was observed by other investigators in their respective studies.¹¹,¹² We had three patients (4.83%) presenting with diseases of the circulatory system [I 00-I99] in our study and the incidence was found to be statistically not significant.

The target blood sugar levels in diabetes are achieved through adjusting the diet, exercise and medication. A change in any one of these three things can alter the blood sugar levels and result in complications due to either hyperglycemia or hypoglycemia. In addition, there are risks of developing diabetic ketoacidosis and dehydration as well. Since, Ramadan fasting involves voluntarily avoiding eating food and drinking water for twelve hours or more during the day from dawn to dusk, it is the duty of the clinician to instruct the patients to modify the exercise and medication schedule during this period.¹³ Ibrahim Salti et. al.¹⁴ observed an increased incidence of severe hypoglycemia in their diabetic patients while observing Ramadan fasting. Similarly, a study done at Algeria showed that, severe hypoglycemia was the main reason for hospitalization during the holy month. Diabetic ketoacidosis, dehydration and orthostatic hypotension were the other diabetes related complications seen while fasting, in their study.¹⁵,¹⁶ There were eight patients with diabetes mellitus included in our study. However, most of them (n=7) turned up for routine follow up and one presented with osmotic symptoms due to hyperglycemia. No one presented with features of hypoglycemia.

Conclusion

Ramadan fasting is a unique opportunity available to the clinicians worldwide, to study the patients under the fasting physiological situation year after year. A large global multicenter prospective study should be contemplated to study the patients in relation to the prevalence of the various diseases, impact on the cardiovascular risk factors, physiological and biochemical changes in the subjects comparing fasters and those who did not fast before, during and after Ramadan. The study may give an insight into various problems especially diabetes, metabolic syndrome, dyslipidemia, obesity and systemic hypertension.

Conflicts of interests: none

Acknowledgments

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References


