Evidence-based Case Report: Acute Diabetic Complication Risks of Ramadan Fasting in Type 2 Diabetics

William J. Iskandar¹, C.T. Handjaja¹, N. Salama¹, N. Anasy¹, M.F. Ardianto¹, D. Kusumadewi²

¹ Faculty of Medicine Universitas Indonesia, Jakarta. ² Department of Community Medicine, Faculty of Medicine Universitas Indonesia, Jakarta.

ABSTRACT

Aim: to investigate causal relationship between Ramadan fasting and acute diabetic complications in adult controlled type 2 diabetics. Methods: a Pubmed's Clinical Queries and Embase search was conducted and resulted in 2 useful articles: 1 systematic review and 1 cohort study to be critically appraised. Results: the incidence of acute diabetic complications is higher during Ramadan, with the relative risk for adult type 2 diabetics who fast during Ramadan is 1.36 and number needed to harm 50. Conclusion: Ramadan fasting was related with acute diabetic complications in adult controlled type 2 diabetics, but the risk was only slightly higher. It is acceptable for type 2 diabetics to fast during Ramadan.

Key words: Ramadhan fasting, acute diabetic complications.
Most Indonesians are Muslims and fast during Ramadan, including the type 2 diabetics patients. For one month they have to restrain from eating and drinking since dawn until sunset (approximately 13 hours/day in Indonesia), but there are no restriction of food intake since sunset until dawn. However, the metabolic alterations during fasting is similar to diabetes mellitus. The incidence of acute diabetic complications during Ramadan is predicted to be higher, such as hypoglycemia, hyperglycemia, ketoacidosis, dehydration, and thrombosis. Therefore, we aim to investigate whether there is causal relationship between Ramadan fasting and acute diabetic complications in adult controlled type 2 diabetics.

CLINICAL QUESTION

Is Ramadan fasting related with acute diabetic complications in adult controlled type 2 diabetics?

METHODS

Search Strategy

Pubmed’s clinical queries and Embase searching was conducted on 28th June 2011 by using terminology listed in Table 1. The results are described in Figure 1.

Selection Criteria

The first selection was based on inclusion and exclusion criteria. We used limit and filter function for Pubmed’s clinical queries and Embase, respectively (Figure 1). After screening for full text availability and reading title or abstract, there were 5 articles suitable. Then we read the full text and obtained 2 articles, 1 systematic review and 1 cohort study.

Critical Appraisal

The articles were appraised by consensus of all authors using appraisal tools from www.cebm.net for systematic review and etiologic study, respectively. The critical appraisal results are showed in Table 2 and Table 3.

RESULTS

A systematic review done by Azizi5 aimed to investigate health condition of fasting people during Ramadan, including diabetics. He

<p>| Table 1. Search strategy used in Pubmed’s clinical queries and Embase on 28th June 2011 |
|-----------------------------------------|---------------------------------|</p>
<table>
<thead>
<tr>
<th><strong>Location</strong></th>
<th><strong>Terminology</strong></th>
<th><strong>Hits</strong></th>
<th><strong>Selected</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Embase</td>
<td>'type 2 diabetes mellitus'/exp OR 'type 2 diabetes mellitus' AND ramadan AND complication*</td>
<td>26</td>
<td>0</td>
</tr>
</tbody>
</table>
searched each articles from different sources and in different languages, especially Muslim countries, starting from 1960-2009. The 113 articles meeting the criteria, ranging from survey to clinical trials, were appraised by blinded reviewers. He concluded that Ramadan fasting is safe for healthy people (including controlled diabetics), but some people/conditions need medical advice. Acute diabetic complications is higher during Ramadan.

A multicenter cohort study done by Salti, et al. aimed to determine the characteristics and circumstances of patients with diabetes in 13 Muslim countries, and study the effect of fasting on diabetics. The methods used were population-based and retrospective cohort study with total randomized 12243 samples. Severe hypoglycemia and hyperglycemia were seen approximately five times more often during Ramadan, with RR 1.36 and NNH 50. They concluded that most type 1 and type 2 diabetics did not follow doctor recommendation during fasting. Education, guidelines during fasting, and the morbidity and mortality risk should be explained for diabetic patients before Ramadan.

**DISCUSSION**

The two articles obtained are only one systematic review and one cohort study, due to several reasons. First, few articles are published because Ramadan fasting research is usually conducted in developing countries, or countries with non-English language. Many relevant abstracts are not available, while others do not meet the inclusion criteria. Most studies also focus on the management of diabetes during Ramadan. These further narrowed useful article numbers.

We appraised the systematic review and found several weaknesses. It did not synthesize...
The type 2 diabetics preference whether to fast during Ramadan should be individually managed and followed by specific assessment to avoid acute complications, according to guidelines from PERKENI or EPIDIAR 2011. The management starts with pre-Ramadan medical assessment to address patients’ whole well-being, education, and risk of fasting. It mainly depends on blood glucose level (controlled or uncontrolled), and the therapy used. The recommended management during Ramadan is showed in Table 4.

While fasting during Ramadan, ingesting large amounts of carbohydrates and fats at sunset should be avoided, and complex carbohydrates are advisable at predawn meal.

Diabetics are also forbidden to do rigorous physical activity which may lead to higher risk of complication. The management of diabetes medications is described in Table 4. Oral agents that act by increasing insulin sensitivity are
Table 4. Recommended management for fasting diabetics

<table>
<thead>
<tr>
<th>Before Ramadhan</th>
<th>During Ramadhan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients on diet and exercise control</td>
<td>Consider modifying the time and intensity of physical activity; ensure adequate fluid intake</td>
</tr>
<tr>
<td>Patients on oral hypoglycemic agents</td>
<td>Ensure adequate fluid intake</td>
</tr>
<tr>
<td>Biguanide, metformin 500 mg, three times daily</td>
<td>Metformin, 1,000 mg at the sunset meal, 500 mg at the predawn meal</td>
</tr>
<tr>
<td>Thiazolidinediones, alpha-glucosidase inhibitors, or incretin-based therapies</td>
<td>No change needed</td>
</tr>
<tr>
<td>Sulfonylureas once a day</td>
<td>Dose should be given before the sunset meal; adjust the dose based on the glycemic control and the risk of hypoglycemia</td>
</tr>
<tr>
<td>Sulfonylureas twice a day</td>
<td>Use half the usual morning dose at the predawn meal and the usual dose at sunset meal</td>
</tr>
<tr>
<td>Patients on insulin</td>
<td>Ensure adequate fluid intake</td>
</tr>
<tr>
<td>Premixed or intermediate-acting insulin twice daily</td>
<td>Consider changing to long-acting or intermediate insulin in the evening and short or rapid-acting insulin with meals; take usual dose at sunset meal and half usual dose at predawn meal</td>
</tr>
</tbody>
</table>


preferable than those acting by increasing insulin secretion. The doses should also be adjusted, especially for those taking insulin.

As for our patient, it is less risky, a controlled type 2 diabetic, to suffer from acute diabetic complications if he fasts during Ramadan. He can fast during Ramadan, but some arrangement should be made. The nutrition and physical activity therapy is suggested as mentioned above, and medications should be managed as described in Table 4.

CONCLUSION

Ramadan fasting is related with acute diabetic complications. The incidence of acute diabetic complications is slightly higher for type 2 diabetics who fast during Ramadan, but fasting is acceptable as long as they control their blood glucose level. Both pharmacological and non-pharmacological therapy need to be adjusted individually. More importantly, Ramadan should be used as a moment to improve diabetic control.

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REFERENCES