



## Review

## The effect of Ramadan fasting on glycaemic control in insulin dependent diabetic patients: A literature review

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## ARTICLE INFO

## Keywords:

Diabetes mellitus

Ramadan

Insulin dependent diabetes

## ABSTRACT

**Background:** Ramadan fasting is one of the five pillars of Islam. People with diabetes are exempted from fasting according to Islamic rules. However, many people with diabetes wish to fast. Physicians are asked frequently by their patients about their ability to fast and the possible impact of fasting on their glycaemic control. Studies about the effect of Ramadan on people with insulin-treated diabetes are scarce. This review aims to provide clinicians with the best recommendations for their patients with insulin-treated diabetes who wish to fast.

**Methods:** Four databases (Medline, EMBASE, Scopus and PubMed) were searched using the following MeSH terms and keywords: “insulin dependent diabetes mellitus”, “type 1 diabetes mellitus”, ‘Ramadan’ “and” “fasting”. In addition, a hand search of key journals and reference lists was performed. Sixteen full text articles were selected for review and critical analysis.

**Results:** All of the included studies except one found improvement or no change in glycaemic control parameters during Ramadan fasting. The incidence of major complications were negligible. Minor hypoglycaemic events were reported in some studies but did not adversely affect fasting. Postprandial hyperglycaemia was a major concern in other studies. However, the incidence of severe hyperglycaemia and diabetic ketoacidosis were trivial.

**Conclusion:** Ramadan fasting is feasible for insulin dependent diabetic patient who wish to fast. Clinicians should advise their patients about the importance of adequate glycaemic control before Ramadan and frequent glucose monitoring during fasting. Certain types of Insulin seem to be more beneficial than other.

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## Contents

1. Introduction	83
2. Methods	84
3. Results	85
3.1. Effect of Ramadan fasting on glycaemic control	85
3.2. Hypoglycaemia in Ramadan	86
3.3. Hyperglycaemia in Ramadan	86
4. Conclusion	87
Conflicts of interest	87
Funding sources	87
References	87

### 1. Introduction

Ramadan fasting is one of the five pillars of Islam [1]. Every healthy adult Muslim must abstain from food and drink during the lunar month of Ramadan from sunrise to sunset. They can eat and

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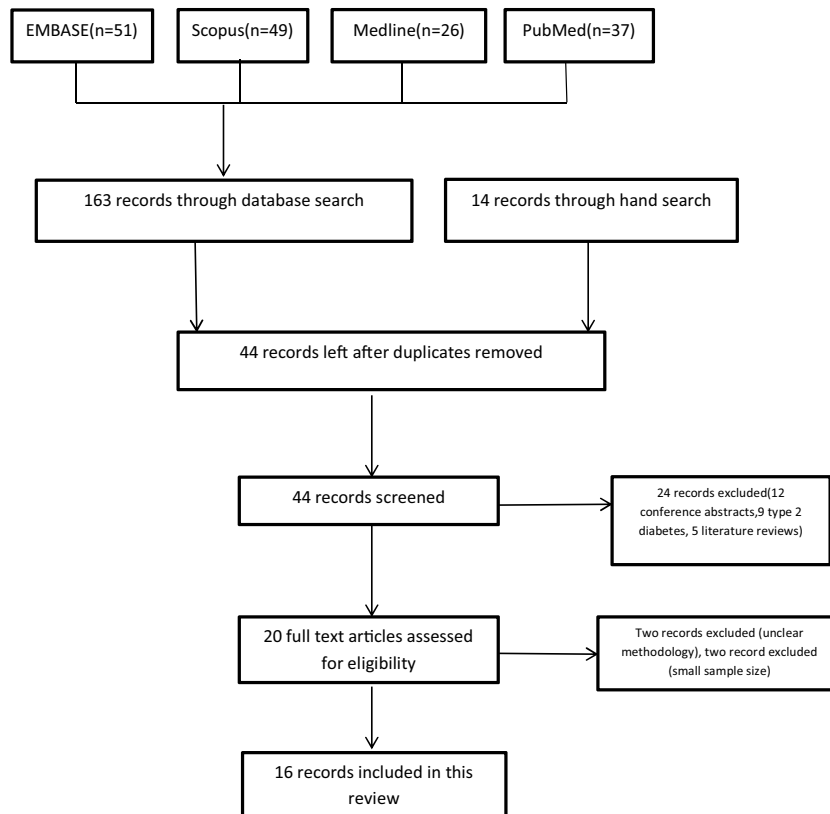
drink freely during night hours. There are two main meals; one small and low caloric meal before sunrise at dawn (sohur) and another large high caloric meal just after sunset (iftar) [2]. This change in dietary habit represents a challenge to both patients and their caring clinicians and may affect glycaemic control adversely leading to major complications like hypoglycaemia, hyperglycaemia and diabetic ketoacidosis (DKA) [2]. Despite the fact that Islamic rules have exempted unhealthy Muslims from fasting including those with diabetes mellitus, many wish to fast and feel guilty if do not. The number of diabetic Muslims who fast is estimated to be 50 million annually [3]. In addition, approximately half of type 1 diabetic Muslims fast every year [4]. Those patients feel obliged to fast during Ramadan and this obligation must be respected by physicians [5]. In countries where Muslims are in preponderance, physicians are always challenged by their patients' inquiries about their ability to fast and the effect of fasting on their plasma glucose control. Physicians should provide clear and evidence-based advice to their patients who intend to fast [6]. Type 1 diabetes has been identified by the American Diabetes Association and the International Consensus Meeting on diabetes and Ramadan (held in Morocco in 1995) as one of the major risk factors for hypoglycaemia in patients who fast based mostly on

**Table 1**  
EMBASE search strategy.

1. [ramadan.mp](#)
2. insulin dependent diabetes mellitus/
3. 1 and 2
4. limit 3 to human
5. limit 4 to English language

## 2. Methods

Four databases (Medline, EMBASE, Scopus and PubMed) were searched using the following MeSH terms and keywords: "insulin dependent diabetes mellitus", "type 1 diabetes mellitus", 'Ramadan' "and" "fasting". A detailed search strategy of EMBASE is shown in Table 1. In addition, a hand search of key journals and reference lists was performed. Duplicates were removed and only full text, English articles, systematic reviews, randomized controlled trials, cohort, case controlled studies and some case series that included in its methodology insulin dependent diabetic patients who fasted Ramadan partially or completely were included. On the other hand, reviews and conference abstracts were excluded. A flow diagram showing the search result is shown below. Ultimately, sixteen



experts' opinion at that time [4,7]. Reviews about the effect of Ramadan fasting on glycaemic control in insulin dependent diabetes mellitus are scarce. This review will discuss the effect of Ramadan fasting on glycaemic control and the incidence of complications like hypoglycaemia, hyperglycaemia and DKA in insulin dependent diabetic patients who fast. This review aims to provide clinicians with the best recommendations for their patients in this regard.

relevant studies were included in this narrative review. Most of the studies were observational except for two case-control studies [2,8] and two randomized trials [9,10]. Two studies were conducted on children [2,5] and one study was on pregnant women [9]. All of the studies except one [4] had small sample sizes. Eight out of the sixteen studies included insulin dependent diabetics exclusively [5,9–15]. Data related to insulin management was reviewed from the remaining studies.

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