



ELSEVIER

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Effect of Ramadan fasting on anthropometric, metabolic, inflammatory and psychopathology status of Egyptian male patients with schizophrenia

Mounir H. Fawzi^{a,*}, Maggie M. Fawzi^b, Nagwa S. Said^c, Mohab M. Fawzi^a,
Amira A. Fouad^a, Hanaa Abdel-Moety^b

^a Department of Psychiatry, Faculty of Medicine, Zagazig University, Zagazig, Egypt

^b Department of Clinical Pathology, Faculty of Medicine, Zagazig University, Zagazig, Egypt

^c Department of Internal Medicine, Faculty of Medicine, Zagazig University, Zagazig, Egypt

ARTICLE INFO

Article history:

Received 17 August 2014

Received in revised form

22 October 2014

Accepted 26 November 2014

Keywords:

Body mass index

Brain-derived neurotrophic factor

Dietary intake

High-sensitivity C-reactive protein

Metabolic syndrome

Positive and negative symptoms

ABSTRACT

Ramadan fasting is believed to be beneficial. We assessed a random sample of 100 Egyptian male schizophrenia outpatients using the Positive and Negative Syndrome Scale (PANSS) and dietary, anthropometric, clinical, and laboratory measures at baseline (T1) before Ramadan of 2014 and during the fourth week of Ramadan (T2). The metabolic syndrome was identified in 31 patients and these showed a reduction of high-density lipoprotein cholesterol (HDLc) and brain-derived neurotrophic factor (BDNF) concentrations and increase in the levels of dietary intakes, body mass index (BMI), waste circumference, systolic and diastolic blood pressure, *all PANSS subscales*, glucose, insulin, HOMA-IR, total cholesterol, triglycerides, low-density lipoprotein-cholesterol (LDL-c), white blood cells, granulocytes, lymphocytes, monocytes, fibrinogen and high-sensitivity C-reactive protein (hs-CRP). In a multiple regression analysis, total energy intake and body mass index (BMI) emerged as the main independent predictors of deterioration in most inflammatory and psychopathology parameters. These findings did not support our hypothesis but suggested that Ramadan fasting has a negative impact on schizophrenia patients, especially those with metabolic syndrome. This could draw attention to the need in the psycho-education management of such patients to focus more on nutrition education for safe fasting.

© 2014 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Islam is the second largest religion in the world, with about 1.7 billion followers. Muslims in Egypt and other Middle East-North Africa countries, however, constitute an overwhelming majority of about 90% of the population in the region (Butler, 2006). All adult Muslims, anywhere in the world, have a religious obligation to fast daily for the 29 or 30 days of Ramadan month every lunar year. Fasting is diurnal. No food, drink, smoking, sex, oral medications, inhalations or intravenous nutritional fluids are permitted from dawn to sunset, but these are allowed at night. Typically, two main meals a night are consumed during Ramadan, *Iftar* (=breakfast) which is served immediately after sunset, and *Sohour* which must be finished before dawn. The exact timings of the beginning and end of the fast each day vary according to date and geographical location. On 1st Ramadan, 2014, in Egypt, *Fajr* (dawn) prayer time

which determines the beginning of *Imsak* (fasting) was at 3:10 a.m. (Local Time), and *Maghrib* (Sunset) prayer which determines the end of fasting was at 19:00 (7:00 p.m.) (Local Time). People fasted exactly 15 h and 50 min.

Muslims do not perceive fasting as a corporal punishment but a blessing with many rewards, especially spiritual. Fasting, however, is not exclusive for Islamic culture. It has been practiced in other religions and cultures around the globe for millennia. Moreover, because of its possible beneficial effects, including increased vigilance and mood enhancement, fasting has been advocated as a form of therapy with various specified procedures and with recently revealed mechanisms (Michalsen and Li, 2013). A comprehensive review of the neurobiological mechanisms of fasting with particular focus on mood was given by Fond et al. (2013). Therapeutic fasting is claimed to be generally safe and well tolerated, though there are some contraindications. Rather surprisingly, psychotic disorders have been considered among indications presenting a risk (Wilhelmi de Toledo et al., 2013).

Although the Quran exempts sick people from fasting, many Muslim patients prefer to fast (Salti et al., 2004). This is a situation

* Corresponding author. Tel.: +20 552304560; fax: +20 552338972.

E-mail address: mounir.fawzi40@gmail.com (M.H. Fawzi).

in which doctors may not feel competent enough to support patients' wish. Physicians' dilemma is probably because despite recent abundant research data, results of many studies are mixed or even conflicting. Thus, it is claimed that, for example, fasting patients with diabetes are at risk of having acute complications such as severe hypo- or hyperglycemia, diabetic ketoacidosis, dehydration, thrombosis, strokes, etc. (Hassan et al., 2014). Omission of morning breakfast was reported to be associated with an increased risk of type-2 diabetes (Mekary et al., 2012). On the other hand, many recent studies indicate that Ramadan fasting either in healthy subjects or in patients with conditions such as type-2 diabetes or metabolic syndrome is very safe and even useful in improving lipid metabolism, anthropometry measures and inflammatory markers of metabolic syndrome (e.g., Aksungar et al., 2007; Faris et al., 2012; M'guil et al., 2008; Shariatpanahi et al., 2012). Eating two larger meals during the day is also reported to be more beneficial for patients with type 2 diabetes than six smaller meals a day (Kahleova et al., 2014).

As opposed to the extensive literature on fasting of healthy volunteers and patients with physical illnesses, only few studies have examined Ramadan fasting in patients with psychiatric disorders, notably mood disorders (Eddahby et al., 2013; Kadri et al., 2000) or in relation to treatment of mood disorders (Farooq et al., 2010). Much less is even known about fasting in relation to other important disorders such as schizophrenia. We know, however, that metabolic disturbances are common in both drug naive and treatment experienced patients with schizophrenia (Britvic et al., 2013; Grover et al., 2012) and that fasting allegedly may improve these disturbances (Shariatpanahi et al., 2012). Yet, according to the latest consensus guidelines for fasting therapy, psychotic disorders are considered an 'indication presenting a risk' (Wilhelmi de Toledo et al., 2013), while as noted by Fond et al. (2013), one cannot determine from the available literature the reason why fasting is risky in psychosis. Anecdotally, we are aware of patients with chronic schizophrenia who observe Ramadan fasting year after year with generally no problems.

Therefore, we aimed in this study to test the hypothesis that during fasting, compared with the non-fasting state, patients with schizophrenia, whether with or without metabolic syndrome, would have improved anthropometric (body mass index (BMI) and waist circumference), metabolic (plasma glucose, insulin, insulin resistance and lipid profile), inflammatory (white blood cells, fibrinogen, brain-derived neurotrophic factor (BDNF) and high-C-reactive protein) and psychopathology (Positive and Negative Syndrome Scale (PANSS)) status.

2. Methods

A short prospective study was performed at the outpatients' clinic of the Psychiatric Department, Zagazig University Hospitals, Egypt. The study setting has been described elsewhere (Fawzi et al., 2013). The first session of this study (T1) was conducted in the week before the start of Ramadan of 1435H. (July, 2014) and the last session (T2) was during the fourth week of Ramadan.

2.1. Participants

From a pool of 134 eligible outpatients, a sample of 100 participants was randomly selected. To be eligible for study inclusion, participants had to: (a) be of male gender, (b) be older than 18 years of age, (c) be regularly attending the psychiatric out-patients clinic for at least the preceding year with a stable DSM-IV diagnosis of schizophrenia, (d) have diagnosis confirmed by two trained psychiatrists independently, using the Structured Clinical Interview for DSM-IV (First et al., 1996), (e) be in a clinically stable condition, adherent to medication and not requiring medication manipulation or hospitalization during the month before enrollment, (f) be planning to fast the whole month of Ramadan, (g) be capable of giving an informed consent as judged by the four-item scale used in our Department (Fawzi et al., 2011), (h) have no history of co-morbid psychiatric disorder, substance abuse/dependence other than nicotine in the preceding

6 months. Before study enrollment, complete medical and neurological assessment and routine laboratory and, if needed, further laboratory and radiological investigations were carried out to exclude patients with evidence of significant systemic disease. However, the presence of metabolic syndrome or any of its components was not an exclusion criterion. Informed consent from every participant and approval from the Research Ethics Committee of the Zagazig Faculty of Medicine were obtained.

2.2. Assessments

2.2.1. Demographic, dietary and clinical variables

These data were collected through semistructured interviews in the presence of at least one close relative to confirm the information given by the patient. Dietary intake was estimated using one 24-h recall (during interview) and two consecutive 24-h records (completed at home under family supervision). Again in the last week of Ramadan, each patient provided, in a similar way, 3-day dietary recall and records. The nutritive value of the consumed foods was calculated using a computer program based on the Egyptian Food Composition tables (Egyptian National Nutrition Institute, 1996). Blood pressure for all patients was determined in the two sessions (T1 and T2) by one investigator (N.S.) using the conventional cuff method in a standardized protocol. All clinical assessments were carried out blind to the laboratory results. Grouping of participants into patients with or without metabolic syndrome, according to the ATP-III criteria (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, 2001), was only made at the end of the study.

2.2.2. Anthropometric measurements

Measures were taken (between 9.00 a.m. and 11.00 a.m.) by trained research assistants while subjects were in the standing position and wearing light clothing but without shoes. The height (to the nearest 0.1 cm) was measured only on session (T1). Other anthropometric measures were performed on both sessions. The weight was taken to the nearest 0.1 kg, and waist circumference was measured to the nearest 1.0 cm at the mid-point between the lowest rib and the iliac crest in a horizontal plane. The body mass index (BMI) was calculated as the weight in kilograms divided by the square of height in meters.

2.2.3. Positive and Negative Syndrome Scale (PANSS)

This is a clinician-rated 30-item scale designed to quantify the severity of positive (seven items), negative (seven items), and general psychopathology (16 items). The scale has been shown to have good internal reliability (Peralta and Cuesta, 1994), construct validity (Kay et al., 1988) and sensitivity to change (Lindenmayer et al., 1986). Interviews were conducted according to the PANSS Manual (Kay et al., 1992) by trained psychiatrists. The inter-rater reliability coefficient in the present study was higher than 0.92.

2.2.4. Laboratory analysis

2.2.4.1. Blood sampling. On the next day of clinical assessments, after 12-h fasting, 12 mL of venous blood was collected from every patient and divided into four parts—1 mL was in EDTA tube for complete blood counts (CBC) testing, 1.0 mL in fluoride tube for glucose measurement and 4 mL in 3.2% sodium citrate tubes to separate out plasma (by immediate centrifugation at 2000g for 20 min at room temperature) for estimation of plasma insulin and fibrinogen. The rest of blood was collected in plain tubes and allowed to clot for 4 h at room temperature and then serum was separated out by centrifugation at 3000 rpm for 10 min for measurement of serum lipids, brain-derived neurotrophic factor (BDNF) and C-reactive protein (CRP).

2.2.4.2. Laboratory methods. Total leukocyte count was tested with standard techniques. Plasma glucose was measured by the hexokinase method. Plasma insulin concentrations were estimated using a commercially available enzyme-linked immunosorbent assay (ELISA) human insulin kit (DRG diagnostics GmbH, Marburg, Germany). Insulin-resistance was calculated using the homeostasis model assessment for insulin resistance (HOMA-IR) formula developed by Matthews et al. (1985): $\{ \text{glucose (mmol/L)} \times \text{insulin (}\mu\text{IU/mL)} / 22.5 \}$. Plasma fibrinogen levels were determined within 1 h of sampling using the clotting method of Clauss (1957). Serum lipids including total cholesterol (TC), triglycerides (TG), and high-density lipoprotein cholesterol (HDLc) were evaluated by standard clinical biochemistry laboratory assays using an ADVIA 1650 autoanalyzer (Siemens Medical Solutions Diagnostic, Newark, DE, USA). Serum low-density lipoprotein cholesterol (LDLc) levels were calculated using the Friedewald Equation (Friedewald et al., 1972). Serum brain-derived neurotrophic factor (BDNF) levels were measured by sandwich ELISA using a commercially available BDNF Emax Immunoassay Kit (Promega, Madison, WI, USA). Assessment of serum high-sensitivity C-reactive protein (hs-CRP) level was performed by a latex particle-enhanced immunoturbidimetric assay using the Roche/COBAS INTEGRA system 400, C-reactive protein (latex) high sensitive assay (Roche Diagnostics Corp., Indianapolis, IN, USA). All assays were performed in duplicate. Protocols were conducted according to the manufacturer's instructions. Absorbance of each well was measured at 450 nm using a Da Vinci

Download English Version:

<https://daneshyari.com/en/article/10304152>

Download Persian Version:

<https://daneshyari.com/article/10304152>

[Daneshyari.com](https://daneshyari.com)