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Ramadan headache

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Abstract

Objectives: To determine the influence of Muslim fasting month of Ramadan on the natural history of headache. *Methods*: A prospective study was carried out on volunteers over four months – two months before Ramadan, the Ramadan and one month after Ramadan. The severity of headache was quantified at the end of each month using Chronic Pain Grade. The components of the global Chronic Pain Grade were: Characteristic Pain Intensity which scored pain intensity, Disability Score which assessed interference with daily activities, and Disability Points where disability days were also scored. The characteristics of headache during Ramadan were also recorded. *Results*: A total of 83 subjects were studied. The male : female ratio was 1: 3. The mean age of the subjects was 22 years (range 18-47 years). Thirty-three subjects were previous headache sufferers. The mean Chronic Pain Grade, Characteristic Pain Intensity, Disability Score and Disability Point were all increased during Ramadan. Among the 33 subjects who were previous headache sufferers, Characteristic Pain Intensity increased in 16 subjects (48%), decreased in 10 subjects and remained unchanged in 7 subjects. Among the 50 subjects who were non-headache sufferers, 19 subjects (38%) had new-onset headache during Ramadan. There was significantly higher proportion of female, and those with stress, fatigue, menstruation, and inadequate sleep among the 19 subjects with Ramadan headache. The Ramadan headache was typically bilateral, throbbing, frontotemporal, and of mild to moderate severity.
Conclusions: Ramadan was a significant precipitating factor for headache. The mechanism of headache was probably multifactorial.

INTRODUCTION

The fasting month of Ramadan is an annual religious practice of Muslims prior to the "Hari Raya Puasa" celebration. During the one-month period, Muslims fast from sunrise to sunset, about 13 hours in tropical Malaysia. Fasting has been reported to be a precipitating factor for headache.[1-3] A well-described example was the Yom Kippur headache, which occurred during the traditional Jewish Day of Atonement.[1] The headache experienced during fasting has been attributed to various factors such as hypoglycemia[4], caffeine withdrawal[5], change in sleep pattern[6] and stress of fasting itself.[1] We describe a prospective study that aimed to determine the influence of the fasting month of Ramadan on the natural history of headache.

METHODS

The subjects consisted of medical students and hospital staff of the University Malaya Medical Center. They were randomly recruited for the study without prior knowledge of whether they were headache sufferers. Subjects who were previous headache sufferers were examined by the study neurologist (NKC) with their headache classified according to the International Headache Society criteria.[7] Subjects who did not have headache in the preceding 6 months were classified as "non-headache sufferers". Informed consent was taken prior to recruitment. The study was carried out over four months period: two months before Ramadan, the fasting month itself and one month after Ramadan.

Headache diary

All subjects were given "headache diary" to record their headache and its known precipitating factors. They were given clear instruction on how to fill up the diary. The headache diary required the subjects to fill the time at onset, duration and nature of headache, the presence or otherwise of stress, inadequate sleep, fatigue and menstruation. The information on the precipitating factors of headache was to be recorded irrespective of whether the subjects experienced any headache. To ensure compliance and proper recording of data, the questions in

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the diaries were kept simple and clear. The subjects were instructed to complete the diaries daily, although those who could only fill up their diaries weekly because of time constraints were also allowed. Every two weeks, the subjects were given reminder to fill up their diaries.

Evaluation of headache

Guided by the headache diary, the headache was evaluated at the end of every month of study using a standard questionnaire. The questionnaire was administered by one of the investigators to elucidate the characteristics of headache. The questions were on 1) The nature of headache, whether it was throbbing, stabbing, tightening or others; location of headache, whether it was frontal, back of head, right or left side or generalized; time of onset of headache, whether it was in the evening, dawn, morning or afternoon; duration of headache, whether it was hours or days; the associated symptoms such as nausea, vomiting, loss of appetite, photophobia, phonophobia and neurological symptoms. 2). The intensity of the pain, its interference on work and other activities. 3) The presence or otherwise of factors which may precipitate headache, such as family, social and work stresses, inadequate sleep defined as total sleeping period reduced by two hours or more compared with the average period, menstruation and fatigue. The aim of the study was not explained to the subjects and was not obvious from the diaries or questionnaires.

Chronic Pain Grade

Based on the diaries and questionnaires, the headache was scored monthly. Chronic Pain Grade has been proposed as a simple method for scoring the multidimensional aspects of chronic pain. It has been shown to correlate with and had predictive validity for unemployment, pain-related functional limitation, depression, self-rated health status, frequent use of opioid analgesics and frequent pain-related doctor visits.[8]

The main components of Chronic Pain Grade were: *Characteristic Pain Intensity* which scored the severity of headache; *Disability Score* which measured the degree of impairment of daily, recreational, social and family activities as well as work, *Disability Points* which added the number of days disabled to the Disability Score. The criteria for determining chronic pain grade, characteristic pain intensity, disability score and disability point has been described previously by von Korf et al.[8]

Statistical analysis

These were carried out using the Student's t, Chi-square tests and Friedman test where applicable.

RESULTS

The study was carried out from October 2000 to January 2001, with December 2000 as the Ramadan fasting month. A total of 83 subjects were studied, consisting of 67 medical and nursing students, 10 staff nurses and 6 other hospital staff. The male : female ratio was 1 : 3. The mean age of the subjects was 22 years (range 18-47 years). Thirty-three subjects (40%) were previous headache sufferers, consisting of migraine (16/33), tension headache (11/33), non-classifiable headache (3/33) and eye-related headache (3/33).

Changes in headache in all subjects

The mean Chronic Pain Grade, Characteristic Pain Intensity, Disability Score and Disability Point of all subjects peaked during Ramadan. When compared with the first month, the mean Characteristic Pain Intensity and Disability Score were significantly increased during Ramadan. The mean of all the parameters (Chronic Pain Grade, Characteristic Pain Intensity, Disability Score and Disability Point) was significantly lower during the fourth month as compared with Ramadan (Figures 1and 2).

Changes in headache among previous headache sufferers

Among the 33 subjects who were previous headache sufferers, the Characteristic Pain Intensity was increased in16 subjects (48%), unchanged in 7 subjects (21%) and decreased in 10 subjects (31%) during Ramadan when compared with the first two months. There were no significant difference in the mean age, male : female ratio and professional status between the 16 subjects who had worsening of headache when compared with the 17 subjects who did not. However, there was significantly higher proportion of subjects with inadequate sleep among those who had worsening of headache (Table 1).

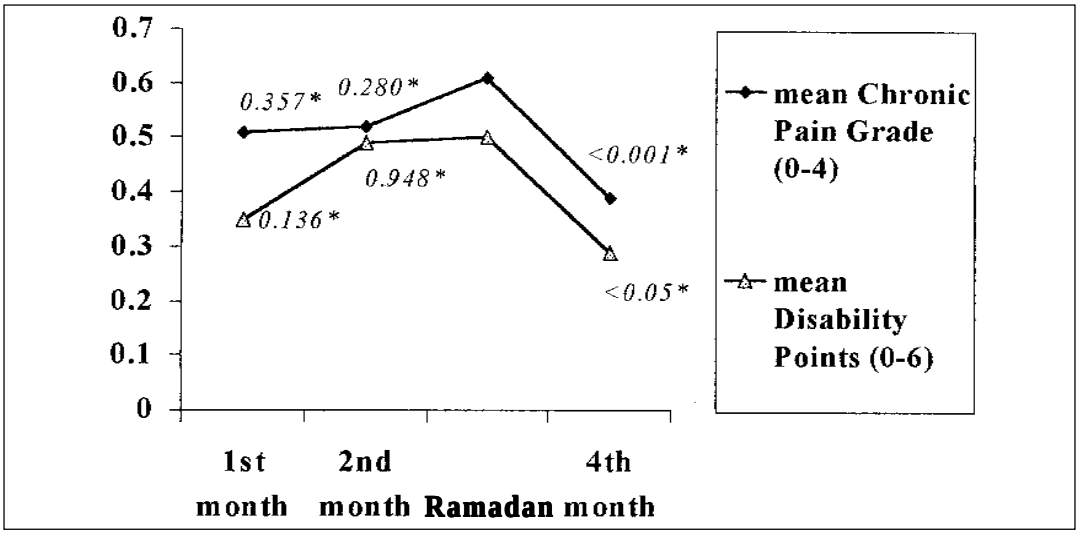

Figure 1: The monthly mean Chronic Pain Grade and Disability Points of 83 subjects during the study period. *p value for comparison with the Ramadan.

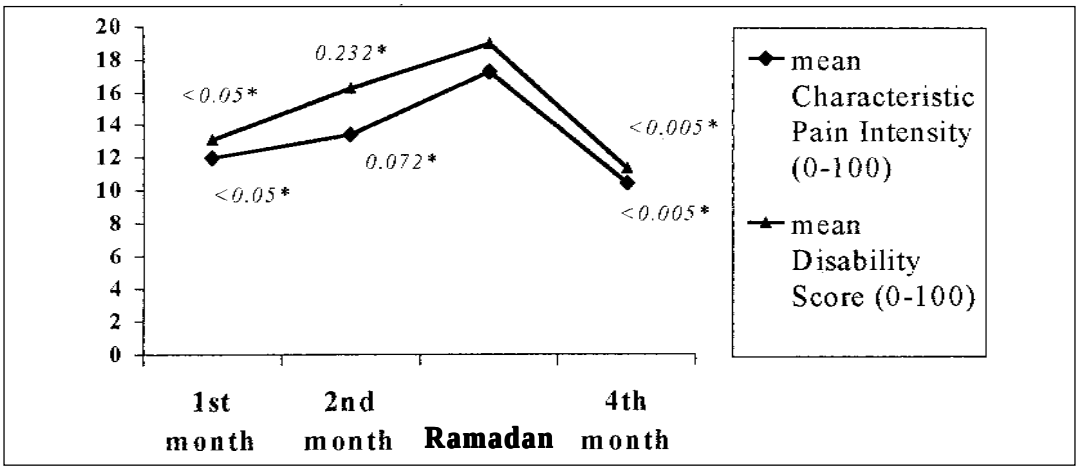

Figure 2: The monthly mean Characteristic Pain Intensity and Disability Score of 83 subjects during study period. *p value for comparison with the Ramadan.

Table 1: Clinical characteristics of 33 subjects who were previous headache sufferers

Characteristics	Subjects with increased Characteristic Pain Intensity during Ramadan (n = 16)	Subjects with no increase in Characteristic Pain Intensity during Ramadan (n = 17)	p value
Mean age (years)	21.7	22.4	0.805**
Male : female ratio	1 : 4	1 : 3	0.923*
Professional status: Students versus staff	13 versus 3	15 versus 2	0.573*
Precipitants of headache:			
a) stress	9	5	0.119*
b) fatigue	9	7	0.387
c) menstruation	5	2	0.171*
d) inadequate sleep	10	4	< 0.05*
e) none	0	8	< 0.01*

*Chi square test
**Student's t test

Changes in headache among non-headache sufferers

Among the 50 subjects who were non-headache sufferers, 19 subjects (38%) had headache during Ramadan. In some of these subjects, headache was also experienced in the other months of study, particularly the month following Ramadan. A significantly higher proportion of the 19 subjects with new-onset Ramadan headache were female, had more stress, fatigue, complained of inadequate sleep and were having menstruation, as compared to those without headache (Table 2).

The 38% new-onset headache among subjects who did not previously suffer from headache was not significantly different from the 48% with increased Characteristic Pain Intensity among the previous headache sufferers (p=0.204).

Characteristics of Ramadan headache

The Ramadan headache was typically described as bilateral, frontotemporal, throbbing, mild to moderate, often lasting for 1-2 hours. Rest, sleep, analgesia and breaking fast often relieved the headache. The characteristics of the headache were not significantly different among those who were previous headache sufferers and those who were not (Table 3). However, there was a tendency for headache to occur in the evening prior to breaking fast in the former and during afternoon in the latter.

Table 2: Clinical characteristics of 50 subjects who were non-headache sufferers

Characteristics	Subjects with headache during Ramadan (n = 19)	Subjects without headache during Ramadan (n = 31)	p value
Mean age (years)	22.8	22.1	0.667**
Male : female ratio	1 : 8	1 : 2.2	< 0.05*
Professional status:			
Students versus staff	13 versus 6	24 versus 7	0.465*
Precipitants of headache:			
a) stress	8	0	< 0.001*
b) fatigue	11	0	< 0.001*
c) menstruation	4	0	< 0.001*
d) inadequate sleep	8	1	< 0.001*
e) none	4	30	< 0.001*

*Chi square test
**Student's t test

Table 3: Characteristics of headache precipitated by Ramadan

	Subjects who were previous headache sufferers (n = 16)	Subjects who were non-headache sufferers (n = 19)	p value
Location	Frontotemporal (8 / 16)	Frontotemporal (13 /19)	0.268*
Nature	Throbbing (14 / 16)	Throbbing (13 / 19)	0.170*
Affected side(s)	Bilateral (9 / 16)	Bilateral (13 / 19)	0.440*
Duration	1 - 2 hours (14 / 16)	1 - 2 hours (15 / 19)	0.528*
Mean Characteristic			
Pain Intensity score	35	36	0.896**
Flashing lights	1	0	
Photophobia	1	0	
Phonophobia	1	0	

*Chi square test
**Student's t test

DISCUSSION

This study showed that during the Muslim fasting month of Ramadan, headache worsened in 48% of subjects who were previous headache sufferers, and new-onset headache occurred in 38% of subjects who did not previously suffer from headache. Thus, Ramadan was a significant precipitating factor of headache.

The Ramadan headache was typically bilateral, frontotemporal, throbbing, of mild to moderate in severity, lasting 1-2 hours. The headache mainly occurred in the afternoon and evening. None of the subjects had vomiting and focal neurological symptoms such as flashing light typical of classical migraine was rarely seen.

Hypoglycemia was said to be a cause for headache during fasting.[4] However, hypoglycemia could not explain the Ramadan headache in our subjects. Under normal condition, the hepatic glycogen stores are usually sufficient to maintain blood glucose level for at least 24 hours.[9] The duration of fasting for our subjects was usually about 12 hours, not long enough to result in hypoglycemia. Diet have also been known to be a precipitating factor for headache.[10] In this study, we did not specifically look into the dietary pattern of the study subjects. However, most of our subjects were medical and nursing students who stayed in hostels that usually served the same type of food throughout the whole year. Thus, dietary factors were probably not responsible for the Ramadan headache. As we did not quantify the daily consumption of coffee, we could not comment on the role of caffeine withdrawal in causing the headache.[5]

This study also showed that for the group who were non-headache sufferers, various common precipitating factors for headache such as stress, fatigue, inadequate sleep and menstruation were significantly increased among the subjects with Ramadan headache as compared to those without headache. These factors could contribute to the development of Ramadan headache. Ramadan is a holy month during which the Muslims strictly practice their religious beliefs. There could be various stresses other than fasting itself which contributed to the development of headache.

Female sex hormone has important influence on headache.[11] Among our subjects who were non-headache sufferers, significantly more females developed headache during the fasting month suggesting a possible role for female sex hormone in the causation of Ramadan headache.

Chronic pain is a multidimensional process involving physiologic, perceptual, cognitive-emotional, behavioral and social responses of the affected individuals.[12] The mechanism of Ramadan headache is probably also multifactorial.

Fasting month precipitated headache in 48% of subjects who were prior headache sufferers and 38% among those who were non-headache sufferers, with no significant difference between the two groups. Thus, prior history of headache did not increase the risk of developing Ramadan headache. The chronic headache sufferers may have a higher tendency to adopt preventive strategies such as avoidance of known precipitating factors, thus influencing the development of Ramadan headache.

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