

Do road traffic accidents increase during the fasting month of Ramadan

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ABSTRACT

Objectives: During Ramadan, adult Muslims stop eating and drinking during the daytime. Fasting may cause physiological habitual and behavioral changes that may cause an increase in the rate of road traffic accidents (RTA) during Ramadan. The aim of this study was to see whether there is a real increase in the rate and severity of patients treated secondary to RTA during Ramadan.

Methods: We enrolled all patients treated secondary to RTA in the Accident and Emergency Department of Princess Basma Teaching Hospital, Irbid, Jordan, during the period October 1st to November 30th 2004 in the study. The Ramadan period was between October 15th and November 13th; we took the rest of the period as a control period. We noted the number of patients, severity of injuries and rate of admission to hospital as well as distribution of the cases according to the time of the day.

Results: We treated 228 patients during the 2 months; 96 during Ramadan and 132 during the control period, significantly less during Ramadan (p -value = 0.004). There were no significant differences between the numbers and severity of injuries among the subgroups of patients in relation to time of the day or the weekdays.

Conclusion: The religious and spiritual atmosphere that embraces fasting people during the holy month of Ramadan causes neutralization of the adverse affects of increased nervousness and high temper of the fasting people. Thus resulting in a decrease rather than an increase in the rate of RTA.

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Ramadan is the ninth month of the lunar year, during this month adult Muslims stop eating, drinking, and smoking each day between dawn and sunset. Reports state that the incidence of road traffic accidents (RTA) increase during Ramadan.^{1,2} The cause of the increase was related to the possible decrease in the psychomotor and physical performances of the fasting subjects, especially during the daytime.³ We conducted this study in a first level Accident and Emergency Department, our aim was to see whether there was a real change in the number and severity of cases, treated secondary to RTA, by comparing them with cases treated during a non-Ramadan period.

Methods. The study was carried out prospectively between the first of October and the end of November 2004. Ramadan elapsed between October 15 and November 13. Princess Basma Teaching Hospital is affiliated to the Faculty of Medicine, Jordan University of Science and Technology. It is placed in the center of Irbid city and its Accident and Emergency (A&E) department is the first take (level one trauma center) of the region. All the patients who were treated secondary to RTAs during the period of the study were included. Information regarding number of patients, their age and sex, and the severity of the injuries were recorded daily. Time of arrival to the A&E was specified, and

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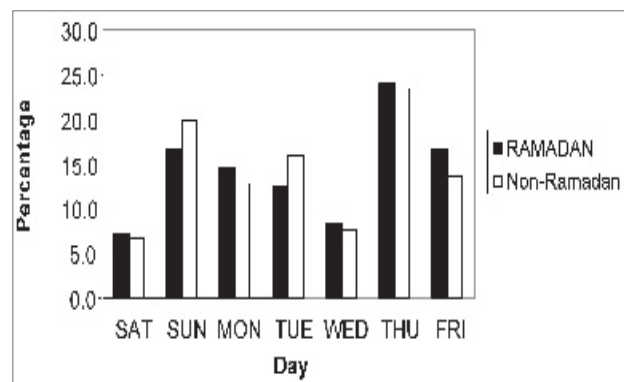
Table 1 - Numbers of patients attending according to the time periods of the day during Ramadan and non-Ramadan.

Time period	No. (%)				Total
	A	B	C	D	
Ramadan period	64 (66.7)	13 (13.5)	14 (14.7)	5 (5.5)	96 (100)
Non-Ramadan period	76 (57.6)	43 (32.6)	11 (8.3)	2 (1.5)	132 (100)

A - 7 am - 12 noon, B - 12 noon - 4 pm, C - 4 pm - 10 pm, D - 10 pm - 7 am

the immediate outcome was also included as discharge or admission to the hospital. The severity of the injury was simply categorized into 3 types; type A, if the injury was mild, like superficial wounds and simple skeletal trauma that did not need hospitalization; type B, deep wounds, skeletal or other trauma that may need hospitalization in the general surgical or orthopedic ward for further management. Type C, included injuries more than type B and or severe head trauma necessitating admission to the intensive care unit. The 24 hours of the day were divided into 4 periods, according to the expected traffic activities; time A between 7 am and 12 noon, which is the time of going to schools and work, time B between 12 noon and 4 pm; represents going back home from schools and work. Time C, between 4 pm and 10 pm; the period of breakfasting in Ramadan as well as moderate outside activities in the non-Ramadan period, like praying and shopping. The last period, was between 10 pm and 7 am, when the outside activities are at minimal level. The numbers of cases in relation to time periods of the day as well as the days of the week were recorded. All the data of the Ramadan and the non-Ramadan periods were compared to see whether there was any significant difference between the 2. Pearson's chi square test was used to measure the statistical difference between the variables.

Results. The total number of the RTA patients who attended the A&E Department between the first of October and the last day of November 2004 was 228 patients; 96 (42%) came during Ramadan, while 132 (56%) patients came during the non-Ramadan period, namely 13 days before and 17 days after Ramadan, the difference was statistically significant (p -value = 0.004). Males comprised 178 (78%) and females 50 (22%). The patients' age ranged between 6-73 years (mean: 23 years). Regarding the grades of the trauma; 180 were grade A, 40 patients grade B, and 8 patients were of grade C. Of those, 38 patients needed admission to the hospital, 30 were admitted either to the general surgical or orthopedic ward, and

**Figure 1** - Comparison between the flow of patients according to day of the week during Ramadan and non-Ramadan.

8 patients were admitted to the intensive care ward. In both groups, the maximum flow of the patients was during the morning hours, while the least flow was during the late night and early morning hours (**Table 1**). The numbers of patients in the 2 periods were comparable, without statistical significance. Regarding the severity of the trauma, during Ramadan, 75 patients were of grade A, 17 of grade B and 4 patients of grade C, while during the non-Ramadan period they were 105 grade A, 23 grade B, and 4 grade C patients. The differences between the 2 groups of numbers were not statistically significant. On looking at the numbers of patients in relation to the specific days of the week, again, there was no significant difference noted. However, slightly higher numbers of patients were seen during Sundays and Thursdays, which are the first and last working days of the week (**Figure 1**). The official week holy day is on Friday and Saturday.

Discussion. Ramadan is the ninth month of the lunar year. During this month, healthy Muslims refrain from eating, drinking, smoking or sexual activities during the daytime, namely between sunrise and sunset. After sunset, these activities are freely allowed until just before dawn. The shifting of feeding activities

towards the nighttime causes change in the meal times from the main 3 meals into 2 main meals, one taken soon after sunset (Iftar meal) and another one taken just before dawn (Sahour meal). With this, there is associated free consumption of coffee and like drinks during the night period, as well as increased smoking for the tobacco smokers. These changes in the dietary habits showed adverse affects on the sleeping hours, as people would stay awake, or wake up late in the night, for the Sahour meal. Epidemiological studies showed this on young adults and workers, where the sleep duration was less than 6 hours in 68% of workers during Ramadan.^{4,5} In addition, the free drinking of fluids and caffeine containing drinks during the night period could affect the quality of the sleep by making the sleep less deep. There is increased proportion of non-rapid eye movement sleep during Ramadan, particularly stage 2 which represents light sleep, while slow-wave sleep (deep sleep) duration and rapid eye movement duration decreased indicating shallow type of sleep.⁶ These changes in the quality and quantity of sleep together with the withdrawal symptoms of psycho stimulant beverages reflect on the fasting subject during the day-time in more than one aspect including sleepiness, increased irritability, decrease in the concentration and decrease in the physical performances.⁷ Regarding sleepiness, Roky et al⁸ found that diurnal fasting induced an increase in subjective and objective daytime sleepiness. Kadri et al⁹ also noted significantly increased irritability during the month of Ramadan; this is noticed more among smokers and, especially related to the decrease in the sleeping hours. The power of memory and concentration as well as physical performances were also demonstrated to decrease, in the fasting subjects, especially regular smokers and coffee consumers.^{9,10} On looking at the causes of RTAs in general, it is well known that human factors are important to consider when looking into its causes. Roky et al³ suggested that we might consider all these expected effects of fasting on the human subjects as important co-factors to explain a probable increase in the rate and severity of road traffic accidents during Ramadan.

In our study, we see the total number of the patients, treated secondary to car accidents, is significantly lower during the Ramadan period. On examining the subgroup of cases, whether their severity numbers according to the time of the day, or according to the days of the week, they were comparable and their

rate was consistent with the expected traffic activities during the course of the day and weekdays.

In conclusion, although we see changes affecting different aspects of human behavior and physiology during Ramadan fasting, still we believe that reducing the working hours, carried out in Jordan as well as many other Islamic countries, and delaying the daily starting time of work and school beside the religious and spiritual atmosphere that embraces people during the holy month of Ramadan, would have its effects on the fasting subjects by neutralizing mainly the expected decreased concentration and increased irritability. By that, the rate of road traffic accidents was actually lower during the month of Ramadan than the non-Ramadan months. However, a more comprehensive study covering all the months of the year and looking into various factors of road traffic accidents could better reflect its rate and results and compare it with the fasting month of Ramadan.

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