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Research Article

The Association of Previous Hajj Performance on the Diabetes Preparation during the Hajj Season

Abstract

Methods: A cross-sectional study, collected from the Pilgrimages with diabetes during the Hajj season. Baseline characteristics were collected by a formal interview and the measurements were self-reported. The primary outcome was to evaluate the patients' Hajj readiness and the association of the previous Hajj performance on this outcome.

Results: Of the 262 patients with diabetes participated, 72.9% have type 2, mean age of 53.1 years; mean duration of diabetes is 9.23 years.

Compared between patients with diabetes participated who did Hajj for the 1st time to who did it more, 79 (30%) vs 183 (70%). Having enough medication 67.1% vs. 67.2% (p 0.63), extra-supply 20% vs. 20.8% (p 0.23), checking glucose during Hajj 16.5% vs. 20.8% (p 0.42), wearing medical wristband 5.1% vs. 6.0% (p 0.77), and having hypoglycemia rescue kit 20.3% vs. 18.3% (p 0.67), respectively.

Those who were seen by the Endocrinology/Family physicians were more likely to inform their physicians about the Hajj but only those seen by Endocrinologist were more likely to be offered a medical letter explaining their condition.

Conclusion: Except for carrying enough medications, pilgrimages with diabetes readiness parameters were far below 50% which indicates poor preparation for Hajj. No impact of previous Hajj performance on the study primary outcome.

Introduction

The Hajj is the Fifth pillar of Islam, an annual Islamic pilgrimage to Makkah, Saudi Arabia and a mandatory religious duty for Muslims which must be carried out at least once in their lifetime by all Muslims who are physically and financially capable of undertaking the journey, and can support their family during their absence [1].

Every year, millions of Muslims make a religious pilgrimage to Makkah on the eighth through thirteenth days of month 12th (Dhu-alhijah) of the Islamic calendar [2]. The gathering during Hajj is considered one of the largest annual gatherings of people in the whole world over a short period of time. Because the Islamic calendar is roughly eleven days shorter than the Gregorian calendar, the Gregorian dates for Hajj varies from one year to another. Thus, each year in the Gregorian calendar, the pilgrimage starts eleven days (sometimes ten days) earlier than the preceding year which affects the season that the Hajj will be held in every few years [3].

During Hajj, pilgrimages perform a series of physical practice which considered moderate in intensity. Those includes person walks counter-clockwise seven times around the Ka'aba, also walks back and forth between the hills of Al-Safa and Al-Marwah, goes to the plains of Mount Arafat and Muzdalifa, and performs a lot of walking between sites. The practices are themselves simple, but the amount of physical activity, the hot climate, and the crowds make the Hajj a rigorous exercise in faith.

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia with disturbances of protein, carbohydrate and fat metabolism resulting from defects in the action, secretion of insulin or both. The effects of diabetes mellitus include long–term damage and serious long-term complications include cardiovascular disease, stroke, kidney failure, foot ulcers and damage to the eyes which may impact their abilities to perform physical activity [3]. Symptoms include increased in thirst, hunger and frequent urination which with the increase in the physical activity may predispose patients to numbers of acute complications like hypoglycemia and dehydration [4].

As of 2014, an estimated 387 million people have diabetes worldwide [5]. 80% of diagnosed cases were in low& middle-income countries, which is equal to 8.3% of the adult population [6]. In the years 2012-14, diabetes is estimated to have resulted in 1.5-4.9 million deaths per year which at least double the risk of death [6]. The number of people with diabetes is expected to rise to 592 million by 2035 [5]. The global economic cost of diabetes in 2014 was estimated to be $612 billion USD [7]. According to the most recent IDF publication, at least 3 out of the top 10 countries with the highest prevalence rates of diabetes in the world are within the Arabic Gulf region (Saudi Arabia 24%, Qatar 23%, and Kuwait 23%) [7].

With increase physical activity during Hajj which may precipitate patients for the acute complications. Many diabetic pilgrimages are admitted to hospitals from diabetic complications during Hajj trip with heart, kidney diseases or diabetic foot [8,9].

The diabetes education is an important aspect to understand

the disease, how it affected by the lifestyle, how to properly manage the diabetes emergency condition like hypoglycemia, and to how to minimize the risk of such complications [10].

The primary study aim was to assess the patient readiness to Hajj trip and its association with type of care, advice received and history of multiple hajj performance.

Methodology

Population and design

A cross-sectional study was conducted between Oct 4th- 6th, 2014. We conveniently selected pilgrimages with diabetes aged 18 years and older from different pilgrimage campaigns in the holy city of Makkah were offered to participate in the study and the information were filled and collected by the team members. The body weight (BMI), height, fasting glucose level, random glucose level, and recent HbA1c were subjectively self-reported.

Data collection

The survey included socioeconomic data, number of previous Hajj trip, pre and during Hajj diabetes related education, and self-reported chronic conditions. The chronic conditions we inquired about were hypertension, hyperlipidemia, stroke, peripheral vascular disease, snoring/witness apnea, chronic renal disease, and diabetic foot ulcer. To assess diagnosed diabetes respondents were asked 4 separate questions: "Have you ever been told by a physician, nurse or other health professional that you have diabetes mellitus; 2) type of diabetes; 3) duration of Diabetes; 4) management of diabetes (oral, insulin, or both).

Pilgrimages readiness and preparation for the Hajj was assessed by the following parameters; the last visit to the diabetes clinic within the last 3 months prior to the Hajj; informing patient physician about the hajj plan, the specialty of the caring physician; any change or adjustment made to the patient medications by the provider; did patient physician performed ECG as part of pre-Hajj clinic evaluation before the trip; regular glucose checking during the Hajj trip; carrying enough supply of medications during the Hajj, wearing wristband, carrying cool wallets for insulin, letter from the caring physician detailing the medical problem and the medications, hand luggage rescue carbohydrate, protective shoes, and diabetes emergency kit.

Data analysis

We analyzed the demographic characteristics and the preparation for the Hajj categories between whom done the hajj for the 1st time and those who performed it before by using the SPSS program using one-sample T-test. The primary goal of this study is to survey and evaluate the diabetic's clinical characteristics and its relation to patient readiness to Hajj trip based on their previous Hajj performance. We also assessed the relation between the different health care provider specialty and the Hajj readiness parameters.

Results

Total of 262 pilgrimages with diabetes participated 237 (90.5%) were male and 25 (9.5%) were female, 65.3% were Saudi and 34.7% Non-Saudi, 95.4% were Middle Eastern ethnicity, 3.4% were African, and 1.15 were Asian. 55.7% with a degree of high school or higher and 21% with an intermediate school degree or less (Table 1). (Please refer to 2nd paragraph in the discussion)

The mean age was 53.06 years old (SD 11.7 years), mean BMI 29.65, 72.9% have type 2 diabetes (T2D) and 27.1% were type 1 diabetes (T1D), with a mean duration of diabetes is 9.23 years, and among them 40% were also hypertensive, 46% with hyperlipidmia and 5.7% with chronic kidney disease. The mean number of previous Hajj trips was 4.16 times.

Of the interviewed pilgrimages with diabetes, 180 (68%) were following up with General Practitioner, 65 (25%) with an

Table 1: Baseline Characteristics.

	N	(%)
Gender		
Male	237	90.50%
Female	25	9.50%
Age		
18 – 34 y	17	-6.48%
35 – 54 y	120	-45.80%
55 – 74 y	114	-43.50%
>75	11	-4.20%
Mean age	53.1 yrs	SD 11.7 yrs
Nationality		
Saudi	171	-65.27%
Non Saudi	91	-34.73%
Ethnic		
Eastern Mediterranean and Middle East	250	95.40%
South Asians	3	1.10%
African	9	3.40%
Hajj Performance		
1st time of Hajj Trip	79	30.20%
Previous Hajj Performance	183	69.80%
Mean times of previous hajj	4.2 times	SD 7.2
Number of previous hajj attempt		
0 – 3 Times	179	-68.32%
4 – 9	48	-18.32%
>10	35	-13.36%
Education		
Illiteracy	32	-12.21%
Primary-Intermediate School	55	-20.99%
High school-Bachelor degree	146	-55.73%
Master-PhD	29	-11.07%
Diabetes Mellitus		
Type 1	71	-27.10%
Type 2	191	-72.90%
Fasting Blood Glucose	151.4	Sd 54.1
Random Blood Sugar	224	Sd 78.3
Hb A1c	8.2	Sd 2.6
Duration of Diabetes Mellitus	9.2 yrs	Sd 7.5 yrs
Hypertension		
Yes	105	-40.10%
No	157	-59.90%
Mean BMI	29.7	5.9
Specialist Physicians		
General Practitioner (GP)	180	68.70%

Endocrinologist	65	24.80%
Family physician	17	6.50%
Last visit to diabetic clinic within last 3 month		
Yes	178	67.90%
No	84	32.10%
Mean time of the last clinic visit	74.07 days	SD 151.5
Inform GP/diabetes specialist about hajj plan		
Yes	94	35.90%
No	168	64.10%
Check of Glucose before hajj		
Yes	123	46.90%
No	139	53.10%
Change in your medication		
Yes –Physicians driven	55	21%
Yes – Patients driven	15	5.70%
No	192	73.30%
ECG		
Yes	122	46.60%
No	140	53.40%
Enough Supply of medication		
Extra-supply just in case	53	20.20%
Just enough	176	67.20%
No	33	12.60%
Wallets to carry insulin		
Yes	46	17.60%
No	216	82.40%
Identifying wristband, card		
Yes	15	5.70%
No	247	94.30%
Having medical report with the patients during the trip		
Yes	20	7.60%
No	242	92.40%
Hand luggage carbohydrate		
Yes	102	38.90%
No	160	61.10%
Protective shoes		
Yes	138	52.70%
No	124	47.30%
Diabetes emergency kit		
Yes	49	18.70%
No	213	81.30%
Check of Glucose during hajj		
Yes	51	19.50%
No	211	80.50%
Mean BMI		

endocrinologist and 17 (7%) with a family physician. The mean time to the last follow up visit was 74 days before the hajj season, 68% had their last follow up visit within 3 months but only 36% of them informed their doctors about their intention to do Hajj.

Compared between participated pilgrimages with diabetes who did Hajj for the 1st time to who did it more, 79 (30%) vs 183 (70%). mean age is 51.7 yr vs. 53.7(p .21), mean BMI 30.8 vs. 29.2 (p.07), mean duration of diabetes 9.5 yrs vs. 9.1 yrs (p.68), mean time of the last clinic visit was 65.4 days vs. 77 days (p.16), 35.4% informed their physician about their trip vs. 36.1% (p 0.92), 10.1% vs. 6.6% (p 0.32) have a medical letter describes their case from their providers, 32.9% vs. 24.04% (p 0.12) changed their medications prior to the trip, and 46.8% vs. 46.4% (p0.9) did ECG prior to their Hajj (Table 2).

1st time Hajj performers vs. previous performers, 67.1% vs. 67.2% (p 0.63) carries enough medications supply , 20% vs. 20.8% (p 0.23) carries extra-supply, 16.5% vs. 20.8% (p 0.42) reports checking their glucose during the Hajj, 5.1% vs. 6.0% (p 0.77) wear medical wristband, 20.3% vs. 18.3% (p 0.67) carries hypoglycemia emergency rescue kit, 39.2% vs. 38.8% (p 0.95) carries carb for rescue hypoglycemia, and 50.6% vs. 53.6% (p 0.67) wear protective shoes. Of the total of 89 patients were on insulin, 61.5% vs. 47,6% (p 0.45) carries insulin wallet (Figure 1).

Most of the caring providers were General Practitioner (GP) (Table 3). Comparing the patients characteristics according the specialties of the provider which are GP, Family physicians, and Endocrinologist; last visit to the clinic within last 90 days 58% vs. 82% vs. 92% (p <0.05), last visit was 84 vs. 66 vs. 50 days (p 0.12), 23% vs. 71% vs. 63% of the patients informed their physicians about the hajj trip (p<0.05). Checking glucose regularly before the trip was 39% vs. 77% vs. 60 % (p 0.002), having medical letter describes their case from their providers 6% vs. 6% vs. 29% (p 0.04), check glucose regularly during the trip was 16% vs. 24% vs. 28% (p 0.04) (Figure 2).

36% of the sample informed their physicians about the Hajj Trip (Table 4). Compare to those who didn't informed their provider

Table 2: Beeline characteristics for multiple (previous) vs 1st time Hajj performers.

	1st Time Hajj performance	Previous Hajj performance	P. Value
Number (%)	79 (30.2%)	183 (69.8%)	0.21
Mean Age	51.7	53.7	
Gender			
Male	69	168	0.26
Female	10	15	
Mean BMI(kg/cm3)	30.8	29.2	0.07
Duration of diabetes (years)	9.5	9.1	0.68
Mean time of the last clinic visit (days)	65.4 days	77 days	0.16
Informed their physician about their Hajj trip	35.40%	36.10%	0.92
Changed their medications prior to the trip	32.90%	24.04%	0.12
Did ECG prior to Hajj	46.80%	46.40%	0.9
Enough Supply of medication	67.10%	67.20%	0.63
Extra-supply	20%	20.80%	0.23
Wallets to carry insulin	61.50%	47,6%	0.45
Identifying wristband, card	5.10%	6.00%	0.77
Medical letter	10.10%	6.60%	0.32
Hand luggage carbohydrate	39.20%	38.80%	0.95
Protective shoes	50.60%	53.60%	0.67
Diabetes emergency kit	20.30%	18.30%	0.67
Check of Glucose during hajj	16.50%	20.80%	0.42

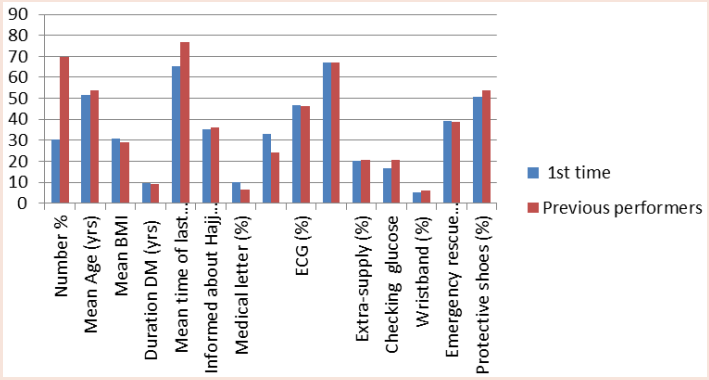

Figure 1: 1st time Hajj performers vs. previous performers.

Table 3: Patients characteristics according to the health care provider.

Sociodemographic Characteristic / Risk Factor	GP	Family Physician	Endocrinologist	p value
Number	180 (68.7%)	17 (6.5%)	65 (24.8)	
Mean Age	52.5 (SD 12.2)	51.1 (SD 12.6)	55.1 (SD 9.8)	0.15
Gender				
Male	163 (90.6%)	14 (82.4%)	60 (92.3%)	0.8
Female	17 (9.4%)	3 (17.6%)	5 (7.7%)	
Type 2 Diabetes Mellitus (%)	128 (71.1%)	14 (82.4%)	49 (75.4%)	
Duration of diabetes	9.13 (SD 7.4)	9.8 (SD 10.1)	9.4 (SD 7.4)	0.8
Hajj performance				
1st Time	60 (33.3%)	2 (11.8%)	17 (26.2%)	0.19
Previous performance	120 (66.7%)	15 (88.2%)	48 (73.8%)	
Last visit to the clinic within last 90 days	104 (57.8%)	14 (82.4%)	60 (92.3%)	<0.05
Last visit (days)	83.6 (SD 178)	66 (SD 97)	49.7 (SD 40)	0.12
Informed Doctor for Hajj trip	41 (22.8%)	12 (70.6%)	41 (63.1%)	<0.05
Before Hajj Trip				
Check Glucose regularly	71 (39.4%)	13 (76.5%)	39 (60%)	0.002
Change in medication by the physician	35 (19.4%	5 (29.4%)	15 (23.08%)	0.49
ECG	83 (46.1%)	3 (17.6%)	36 (55.4%)	0.35
During Hajj Trip				
Enough supply of medication	125 (69.4%)	11 (64.7%)	40 (61.5%)	0.27
Identifying wristband	8 (4.4%)	2 (11.8%)	5 (7.7%)	0.27
cool wallets to carry insulin	30 (16.7%)	2 (11.8%)	14 (21.5%)	0.43
Medical letter	10 (5.6%)	1 (5.9%)	19 (29.2%)	0.04
Hand luggage carbohydrate	64 (35.6%)	9 (52.9%)	29 (44.6%)	0.15
Protective shoes	93 (51.7%)	11 (64.7%)	34 (52.3%)	0.82
Diabetes emergency kit	36 (20%)	5 (29.4%)	8 (12.3%)	0.23
Check Glucose regularly	29 (16.1%)	4 (23.5%)	18 (27.7%)	0.04

about their Hajj plan, 96% of those who informed their physician had their last clinic visit within the last 90 days (p <0.05), more likely to wear identifying wristband during the Hajj trip 12% (p 0.002) , more likely to carries carbohydrate hand luggage 53% (p <0.05) (Figure 3).

Discussion

Hajj is one of the five pillars of Islam which involves increase in the physical activities which may precipitate individuals with chronic medical conditions for acute complications. Pilgrimages with diabetes are at increased risk of such acute complications like dehydration and hypoglycemia. Proper patient's education and making sure patients is ready for the trip is an essential component for a safe Hajj trip.

Up to our literature review and to the best of knowledge, there is no published study that has assessed the patients with diabetes readiness for such trip. In this study we showed that the overall readiness's for pilgrimages with diabetes were poor according to the studied parameters. Those outcomes weren't affected by demographic distribution, race, gender education level or the number of previous Hajj performance.

When we stratified patients according to the provider specialty, although there was no significant difference in their baseline

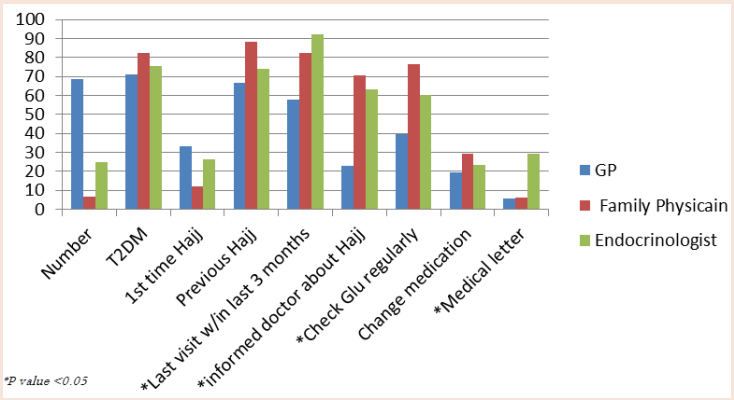

Figure 2: The difference when the provider is Endocrinologist vs. Family physician vs. General practitioner (GP).

Table 4: Patients characteristics according to whether patients informed their provider about the Hajj trip plan or not.

	Informed Doctor for Hajj trip				p value
	No		Yes		
Number	168 (64.1%)		94 (35.9%)		0.76
Mean Age	52.9 yrs	SD 12.6	53.4 yrs	SD 9.9	
Gender					
Male	153	91.10%	84	89.40%	0.65
Female	15	8.90%	10	10.60%	
Type 2 Diabetes Mellitus	122	72.60%	69	73.4	0.89
Duration of diabetes	8.9 yrs	SD 7.4	9.9 yrs	SD 7.8	0.29
Hajj performance					
1st Time	51	30.40%	28	29.80%	0.92
Previous performance	117	69.60%	66	70.20%	
Times of Previous Hajj Trips	3.7	SD 6.2	4.9	SD 8.7	0.2
Last visit to the clinic within last 90 days	88	52.40%	90	95.70%	<0.05
Last visit was... days	90.6	SD 185.5	44.5	SD 35.6	0.018
Before Hajj Trip					
Check Glucose regularly	75	44.60%	48	51.10%	0.23
Change in medication by the physician	30	17.90%	25	26.60%	0.15
ECG	71	42.30%	51	54.30%	0.6
During Hajj Trip					
Enough supply of medication	111	66.10%	65	69.10%	0.68
identifying wristband	4	2.40%	11	11.70%	0.002
cool wallets to carry insulin	29	17.30%	17	18.10%	0.87
Medical letter	9	5.40%	11	11.70%	0.06
Hand luggage carbohydrate	52	30.90%	50	53.20%	<0.05
Protective shoes	89	53%	49	52.10%	0.89
Diabetes emergency kit	29	17.30%	20	21.30%	0.42
Check Glucose regularly	34	20.20%	17	18.10%	0.67

characteristics; the diabetics whom seen by the Family physicians or the Endocrinologist were significantly more likely to visit the clinic within 3 months from the Hajj trip, informing their provider about the Hajj plan, and more likely to check their glucose regularly. Only those seen by Endocrinologist were offered a medical letter explaining their medical condition and their medications.

Around half of the patients who were on insulin carries insulin wallet which is disappointing since the weather during the Hajj as well as the Hajj living situation (most of them stay in tents during the Hajj days) increases the chance of insulin denaturing which may increase the risk of dehydration and hyperglycemia.

Those who visited the provider clinic within the last 3 months from the Hajj season were more likely to inform their physicians about the Hajj trip and significantly more likely to wear medical wristband and more likely to carry carbohydrate for hypoglycemia treatment.

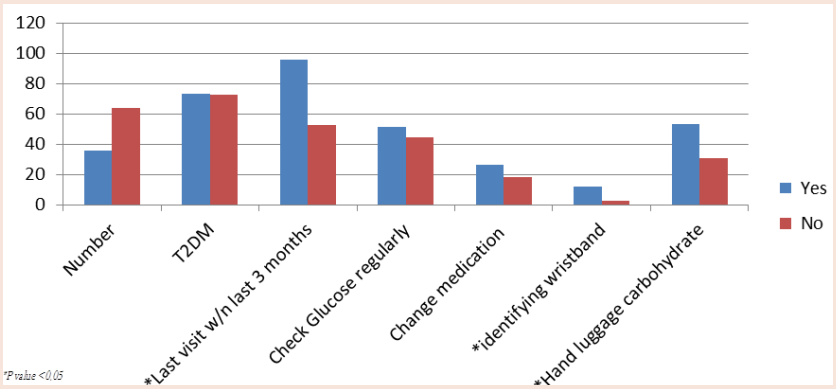

Figure 3: Informed Doctor about Hajj trip.

The observed poor readiness parameters despite the multiple previous Hajj performance may be related to lack of proper patient-physician communication as well as seeing general practitioner who may not aware about the recent related recommendations. Increase awareness among the providers and among the public about the importance of the clinic visit and informing the provider about the Hajj plan will increase the chance of proper readiness for such trip.

Our study has strength and limitations. The strength includes the relatively original research question that bridges relatively lack of information. The limitations that are our study design which limits our ability to assess causality, self-reported data, predominantly Saudi male, most of whom multiple Hajj performers, and the small sample size which limits the generalizability potential of such study.

Our recommendation to pilgrimages with diabetes who want to perform Hajj trip includes; patients should inform the caring physician about the Hajj Trip, optimize medical treatment with your provider aiming for better control of blood glucose and blood pressure during Hajj, vaccination (Influenza and meningococcal vaccines), carry adequate medications and cool pack to store insulin, finally carry hypoglycemic rescue kit [11]. Also, during Hajj Trip always wear Protective shoes, check glucose before any vigorous activity, drink a lot of water during the day (at least 8 glasses) [12] and Eating a balanced health food contain an adequate Carbs, Fat and Protein [13].

Conclusion

Pilgrimages with diabetes in our study were older, overweight and have longstanding history of diabetes. Except for carrying enough medications, all other studied Hajj trip readiness parameters were far below 50% which indicates poor preparation for the Hajj trip. There was no impact of previous Hajj performance on the study primary outcome.

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References

1. Long, Matthew (2011) Islamic Beliefs, Practices, and Cultures. Marshall Cavendish Corporation. 86.
2. Gabriel Said R (2012) The Emergence of Islam: Classical Traditions in Contemporary Perspective. Fortress Press. 33.
3. World Health Organization (WHO), Hajj related health problem 1999.
4. Diabetes Fact Sheet. WHO. Jan. 2015
5. The International Diabetes Federation (IDF) facts sheet. 2014
6. The top 10 causes of death. World Health Organization. Oct 2013.
7. International Diabetes Federation: IDF Diabetes Atlas. 6th edition. 2013
8. Al-Ghamdi SM, Akbar HO, Qari YA, Fathaldin OA, Al-Rashed RS (2003) Pattern of admission to hospitals during muslim pilgrimage (Hajj) Saudi Med J 24: 1073-1076.
9. Alzahrani AG, Choudhry AJ, Al Mazroa MA, Turkistani AH, Nouman GS, et al. (2012) Pattern of diseases among visitors to Mina health centers during the Hajj season, 1429 H (2008 G). J Infect Public Health. 5: 22-34.
10. Alsafadi H, Goodwin W, Syed A (2011) Diabetes care during Hajj. Clin Med 11: 218-221.
11. Mansour Aivash, Sepehr Haghighi (2012) Recommendations for patients with Diabetes Mellitus during Hajj pilgrimage J Res Med Sci 17: 988-989.
12. Beshyah S, Sherif I (2008) Care for People with Diabetes during The Moslem Pilgrimage (Haj) An Overview. Libyan J Med 3: 39-41.
13. Franz MJ, Bantle JP, Beebe CA, Brunzell JD, Chiasson JL, et al. (2004) Nutrition principles and recommendations in diabetes. Diabetes Care 27: S36-46.