Macedonian Journal of Medical Sciences. 2010 Jun 15; 3(2):144-148.
doi:10.3889/MJMS.1857-5773.2010.0093
Clinical Science

OPEN ACCESS

Functional Analysis of Mutahassaneen Area during Hajj 1427Hijra

Khalid Obeid Dhafar, FRCS[1], Zohair Jamil Gazzaz, MB, ChB, PhD[2], Abdul Fatah Sindy, MBBS, MD[3], Mian Usman Farooq, MBBS, MSc[4]

[1]General Surgery Consultant, Holy Capital Health Affairs Director General, Ministry of Health, Makkah, Saudi Arabia; [2]Health Research Centre Director, Consultant Diabetologist, Al-Noor Specialist Hospital, Makkah, Saudi Arabia; [3]Head of Emergency Department, Consultant Emergency Medicine, Al-Noor Specialist Hospital, Makkah, Saudi Arabia; [4]Medical Research Officer, Health Research Centre, Al-Noor Specialist Hospital, Makkah, Saudi Arabia

Citation: Dhafar KO, Gazzaz ZJ, Sindy AF, Farooq MU. Functional Analysis of Mutahassaneen Area during Hajj 1427Hijra. Maced J Med Sci. 2010;3(2):144-148. doi.10.3889/MJMS.1957-5773.2010.0093.

Key words: Mutahassaneen Area; Hajj; Al-noor; Makkah.

Correspondence: Zohair Jamil Gazzaz, MB, ChB, PhD. Health Research Centre (Education Centre), Al-Noor Specialist Hospital, P.O. Box 6251 – Holy Makkah, Saudi Arabia. E-mail: hrd_alnoor@yahoo.com. FAX Number: +966 (02) 5664393.

Received: 17-Dec-2009; Revised: 09-Feb-2010; Accepted: 12-Mar-2010; Online first: 06-Apr-2010

Competing Interests: The authors have declared that no competing interests exist.

Abstract

Objective. This study highlighted the activity of Mutahassaneen Area during Hajj-1427 Hijra (H).

Methodology. This Study was a retrospective observational review of those Hajj patients who stayed in the Mutahassaneen Area "a temporary ward opened adjacent to Al-noor Specialist Hospital, Makkah, KSA, for 21 days for transaction of discharged Hajj patients from inpatients and emergency wards to their respective Hajj missions or groups". Subjects' demography, diagnosis, with dates and timings of admission and discharge was collected. Data was analysed by SPSS version 13. A p-value $\leq$0.05 was considered significant.

Results. Study included 619 patients with predominantly males 426 (68.8%). Majority of subjects 373 (60.3%) stayed $\leq$2 hours in area as well as $\leq$2 days in wards 355 (57.4%). Females spent lesser time than males in area (p=0.02). Males stayed longer in wards as well as in area (linear regression p-value=0.005). Circulatory system diseases counted maximum 186 (30%). A difference was found among stay of different diagnostic groups in area (p=0.05) as well as in wards (p<0.001). Arabic countries Hajjes were maximum 186 (30%) and Iranian spent least time in the area (1.2 hours).

Conclusion. Males were predominant and females spent less time in area. Diseases of circulatory system and Hajj visitors of Arabic world were dominant.

Introduction

The Kingdom of Saudi Arabia has a unique position in Islamic world, as the custodian of two holiest places, Makkah and Madinah [1]. More than two million Muslims gather for a certain period of time which leads to peak population in every sector of life in Saudi Arabia especially in Makkah and Madinah cities during pilgrimage (Hajj) [2]. Hajj has to be completed in specific time period make Hajjes reluctant to seek medical advice because of busy schedule [3,4]. During the Hajj season many pilgrimage (Hajjes) get free medical advices ranging from minor consultation to major surgery from any Government hospital [5]. Health services occupy a high priority in developing the agenda of Saudi Arabia, ie Saudi culture-devotion to Islam [6].

Mutahassaneen Area has been prepared every Hijre calendar year temporarily, adjacent to Al-noor Specialist Hospital, Makkah, Saudi Arabia, for transaction of discharged Hajj patients from inpatients and emergency wards to their respective Hajj missions or groups. This

area works for 21 days from 29th of Dhul-Qauda to 20th of Dhil-Hajja, for each year.

In this complex and overcrowded situation there must be an unmated need for hospital evacuation arrangement in order to manage any incoming disasters. The threats like natural disasters and hazardous material spills, eg gas cylinders, and terrorist incidents have complicated this complex problem. Its importance continues to grow, but consistent approach to tackle this problem is still in infancy.

The purpose of our study was to expose the function or utilization of Mutahssineen Area in the form of patients' profile who used this area as transaction place from hospital to their respective Hajj mission.

Materials and Methods

Study Settings

This retrospective observational study was conducted in Mutahessineen area of a tertiary care referral teaching hospital, in Makkah, Saudi Arabia, the Al-noor Specialist Hospital. Mutahessineen is an Arabic word that means "improved from illness". This study focused upon those Hajj patients who stayed in the Mutahassaneen Area "a temporary ward opened adjacent to Al-noor Specialist Hospital, Makkah, KSA, for transaction of discharged Hajj patients from inpatients and emergency wards to their respective Hajj missions or groups". This area worked for 21 days for each Hijre year from 29th of Dhul-Qauda to 20th of Dhil-Hajja, 1427H (corresponding to December 19, 2006G to January 10, 2007G). No such kind of areas has been established in other place of Makkah or Saudi Arabia. Every discharged patient from hospital has to be received in this area before he transferred to Hajj mission but the stay for patients discharged from emergency ward depended upon the availability of hajj mission, if not then they had to wait in area for them. This area covered 780 m^2, with 30 male and 14 female beds. One specialist, one resident and 4 staff nurses were appointed in each of the three shifts in this area. Sometimes during the said period this area also worked to enhance the evacuation plan of said hospital or any other hospital to keep patients for the time being to cope with the urgent management of the victims of disasters. It can also serve as the triage area. This area has to be established only during Hajj season of each year adjacent to Al-Noor Specialist Hospital. We defined the Hajj session as total Hajj visitors who came for performing the Hajj of 1427 H. This study included 619 Hajjes out of 804 who were transferred to area during the study period. The remaining subjects' data were deficient in one or more aspects. The data was collected from computerized hospital information system (HIS) and reviewed for subjects' demography, diagnosis, and timings of admission and discharge from the hospital as well as from Mutahassaneen Area. Patients were divided according to regional classification of Ministry of Health, Saudi Arabia, for Hajjes [7].

To highlight the crowding of area and concern of Hajj groups for their patients, stay in the Area was divided into four categories, ie $\leq$2, >2-4, >4-6 and >6 hours. Age groups were divided into $\leq$40, 41-60, 61-80 and >80 years. The final diagnoses were categorized according to international classification of diseases (ICD-10) [8]. Similarly patients' stay in wards were also analyzed and categorized as $\leq$2, >2-4, >4-6 and >6 days.

We declare that we have no financial or personal relationship(s) which may have inappropriately influenced us in writing this paper.

The ethical approval was taken from hospital board of directors after they had been made aware in detail of the purpose of study.

Chi-squared test was applied to categorical data, while two sample t-tests with equal variance, analysis of variance with single factor (ANOVA) were applied to measurement data and Pearson correlation as well as linear regression analysis was done to explain relations of subjects' stay in ward and area.

Results

During study period of 21 days, our emergency department facilitated 4264 Hajj patients out of total 5139 Hajj patients and, 804 Hajj subjects received our inpatient services out of 1089 Hajj patients who got admissions during the Hajj session 1427H. In this study 619 (77%) out of 804 Hajj patients were analyzed. The bed occupancy rate of area was 10.9%.

Males were significantly high 426 (68.8%) than females 193 (31.2%) (p<0.001). Mean age of males (63.3

Table 1: Area stay (hours).

Variables		N (%)	Male*	Female*	Significance
Stay in hours	$\leq$2	373 (60.3)	39.6	20.7	*p<0.001*†
	>2-4	118 (19.1)	12.6	6.5	
	>4-6	43 (6.9)	5.5	1.5	
	>6	85 (13.7)	11.1	2.6	
Total		619 (100)	68.8	31.2	*p<0.001*†
Mean (rang)			4.7 (169.7)	2.2 (29)	*p<0.05*††

*Data is presented as percentage; †x^2 test; ††Students' t-Test.

years) was significantly higher than females (58.2 years) (t-test = 4.54, p<0.001). More than half of subjects 373 (60.3%) stayed ≤2 hours in area as well as in ≤2 days in wards 355 (57.4%). Mean length of stay of females was lesser than males in area (p=0.02) but no difference was found regarding their stay in wards (p=0.5). Regarding males who stayed longer in wards also stayed longer in area (Pearson correlation = 0.3, linear regression p-value=0.005) but no such kind of relation was found

Table 2: Relation of stay in wards with stay in Area (n=619).

Variables		Stay in wards in days				
		≤2	>2-4	>4-6	>6	Total, N (%)
Stay in area in hours	≤2	35.9	14	5.2	5.2	373 (60.3)
	>2-4	9.9	6	1.9	1.3	118 (19.1)
	>4-6	4	1.6	0.3	1	43 (6.9)
	>6	7.6	3.9	0.8	1.6	85 (13.7)
Total		57.4	25.5	8.1	9	619 (100)

Data is presented in percentage.

regarding females stay (Pearson correlation = 0.1, linear regression p-value = 0.3). Subjects with age >60 years 381 (61.6%) were more frequent but no difference was found among the mean stay of different age groups in area (ANOVA p-value = 0.8) as well as no correlation was found between their increasing age and stay.

Table 3: Area stay with age groups.

Age groups (years)	N (%)	Male*	Female*	Mean stay ± SD (p>0.05) †
≤40	40 (6.5)	3.6	2.9	2.1 ± 2.8
41-60	198 (32)	19.4	12.6	3.9 ± 13.9
61-80	337 (54.4)	39.7	14.7	4 ± 11.7
>80	44 (7.1)	6.1	1	4.5 ± 8.8
Total	619 (100)	68.8	31.2	

*Data is presented as percentage; †ANOVA test.

Maximum patients belonged to circulatory system diseases 186 (30%) and subjects of diseases of musculoskeletal system 10 (1.6%) had maximum stay in area (13.5 hours) as well as in wards (9.8 days). There was

Table 4: Subjects final diagnosis with stay.

Diagnosis with ICD-10 Codes	N (%)	Male*	Female*	Wards† (p<0.05) ††	Area† (p<0.05) ††
1- Diseases of circulatory system (I00-I99)	186 (30)	21.3	8.7	2.9 ± 3.3	2.9 ± 7
2- Injury, poisoning and certain other causes (S00-T98)	145 (23.4)	15.8	7.6	3.1 ± 3.1	4.2 ± 5.7
3- Diseases of respiratory system (J00-J99)	103 (16.6)	12.4	4.2	2.5 ± 2.4	5.6 ± 17.7
4- Diseases of digestive system (K00-K93)	65 (10.5)	7.4	3.1	3 ± 2.1	2.5 ± 4.4
5- Endocrine, nutritional and metabolic diseases (E00-E90)	25 (4)	2.9	1.1	4.4 ± 7.2	2.7 ± 3.9
6- Diseases of skin and subcutaneous tissues (L00-L99)	17 (2.7)	2.1	0.6	6.6 ± 5.9	11.4 ± 40.8
7- Neoplasm, diseases of blood and blood forming organs (C00-D89)	17 (2.7)	1.3	1.5	3 ± 1.9	1.6 ± 1.7
8- Symptoms, signs and abnormal findings (R00-R99)	15 (2.4)	1.5	1	2.6 ± 2.3	3.1 ± 4.7
9- Diseases of musculoskeletal system and connective tissue (M00-M99)	10 (1.6)	1.1	0.5	9.8 ± 7.5	13.5 ± 34.2
10- Pregnancy, child birth and peurperium (O00-O99)	9 (1.5)	0	1.5	1.1 ± 1.1	0.8 ± 0.8
11- External causes of morbidity and mortality (V01-Y98)	7 (1.1)	1	0.2	2 ± 1	1.4 ± 1.9
12- Diagnosis with ≤1% (A00-B99, G00-G99, H00-H95, N00-N99)	20 (3.2)	1.9	1.3	2.8 ± 1.8	3.2 ± 5.4
Total	619 (100)	68.8	31.2		

*Data presented in percentage; †Data presented as mean ± standard deviation; ††ANOVA test.

a significant difference among mean stay of different diagnostic groups in area (ANOVA p-value = 0.05) as well as in wards (ANOVA p<0.001).

Table 5: Subjects regional distribution with stay.

Regional classification according to Ministry of Health, Saudi Arabia	N (%)	Male	Female	Wards† (p>0.05) ††	Area† (p>0.05) ††
1- Arabic (Egypt, Syria, Sudan etc)	186 (30)	22.3	7.8	2.5 ± 2.4	3.8 ± 13.4
2- South Asia (Pakistan, India, Bangladesh, China)	182 (29.4)	21	8.4	3.5 ± 3.8	3.7 ± 7.6
3- Turkey, Europe, America	91 (14.7)	10.7	4	2.5 ± 1.9	3.7 ± 12.2
4- South Eastern Asia (Indonesia, Malaysia, Filipinas)	87 (14.1)	8.1	6	4.8 ± 4.9	5 ± 18.3
5- Not Arabic Africa (Nigeria, Mali, South Africa, Rwanda, Ethiopia)	50 (8.1)	4.5	3.6	3.1 ± 4.8	4.7 ± 6.3
6- Iranian	23 (3.7)	2.3	1.5	2.2 ± 1.7	1.2 ± 1.3
Total	619 (100)	68.8	31.2		

*Data presented in percentage; †Data presented as mean ± standard deviation; ††ANOVA test.

Patients from Arabic countries counted maximum 186 (30%) followed by South Asians 182 (29.4%). Iranian spent least time in wards (2.2 days) as well as in area (1.2 hours). No difference was found among the mean stay of different nationalities subjects (ANOVA p-value = 0.8).

Minimum patients (0.8%) transferred to area on 29/11/27H while maximum length of stay (9.5 hours) was taken by those patients who transferred to area on 9/12/27H.

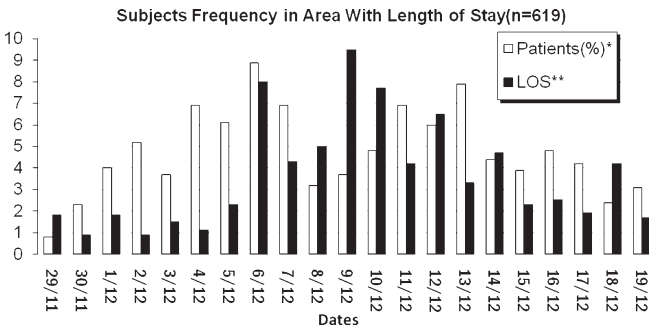

*Figure 1: Subjects frequency in area with lenght of stay. Dates are according to lacunar calendar (Hijrah) starting from 29th of Dhul-Qauda to 19th of Dhil-Hajja till twelve midnight. *Length of stay (LOS) of study subjects in hours (mean). Patients' frequency in percentage.*

Out of the subjects only six patients got re-admission, 4 of them from Arabic, one from not Arabic African and one from south East Asian region. Four patients were less than 50 years of age. Three subjects were belonged to diseases of blood forming organs, 2 from injury & poisoning and one from circulatory system.

Discussion

As emergency department Hajj visits and hajj patients' admissions were peak during the study period so it gave a reflection of usage of Mutahaseneen area as an

evacuation area as well as concerning of respective Hajj missions with their patients. Ultimately it emphasized Saudi health facilities provided to Hajj patients, or it compared health services provided to hajj subjects by Al-Noor hospital with other hospitals in Makkah. It also gave a picture of utilization of health facilities by different nationalities.

This data obviously depicted only Hajj patients not Hajj visitors as a whole. Most of subjects stayed ≤2 hours in area as well as in wards which may be due to their critical schedule and ambition to stay most of the time near Harram to perform the rituals, similarly more than half stayed in ward ≤2 days as mentioned in the study of Gazzaz [5]. Females left the area earlier than males but no significant difference in stay in wards could be found which reflected that Hajj missions are more vigilant to receive female Hajj visitors than males but inpatient stay obviously depended upon the health condition. Our study and that of Gazzaz [5] showed that inpatients admissions had prominent age group >60 years contrary to the study of Shakir [2] which showed that outpatient department had minimum patients of the same age group. This age group was more likely to have co-morbidities. The prominent age group in our study depicted that most of people perform Hajj after official retirement from government jobs and fulfilling their domestic liabilities. This study somehow also explained the Hajj patients' characteristics so can be comparable with the study of Al-Ghamidi [9] in which the prominent age group and the gender was the same as ours. Least difference in numbers between male and female was found ≤40 years of age group which increased gradually till it reached maximum >80 years of age where male to female ratio was 6.1:1. Although it is not the total Hajj statistics but we can use it as study sample, the probable cause might be the post-menopausal pathology especially osteoporosis which hindered females to perform Hajj due to its strenuous physical activity. Diagnostic group of circulatory system was most prominent in our study contrary to Dhafar [10] and Shakir [2]. Patients of diagnostic groups of diseases of skin and subcutaneous tissues as well as diseases of musculoskeletal system stayed longer in wards and also in area because most of them diagnosed as the cases of necrotizing fasciitis and cellulites which need more time to be healed after surgery or medical management, but their longer stay in area may be because of patients' poor decision to perform rituals due to their wound dressing, bandage which reflected their dependency on others and fear of chances of contamination of wound. Majority of Hajj visitors were from Arabic countries like the study of Dhafar [10] and Shakir [2] but unlike that of Gazzaz [5]. Iranians were more concerned about their health due to their less number as well as shortage of duration in wards which reflected their less severity of diseases. However, Iranian Hajj mission was more vigilant and concerned in receiving sooner their Hajjes from area or their shorter stay in area reflected their good and effective communication with their mission. Area gradually crowded from 29th of Dhil-Qaeda reached maximum on 6th of Dhil-Hajja. This might be happened due to cross infections because of gradual overcrowding of Makkah as well as excess physical activity by doing more Tawaf & Umra and then gradually declined up to 8th of Dhil-Hajja but again raised till 13th of Dhil-Hajja due to final strenuous activity during Hajj days and Jamarat stoning. Moreover, patients who transferred in area on 9th and 10th Dill-Hijja stayed longer in area most probably because Hajj missions were focusing on healthy Hajjes in assisting their most important ritual which is the stay in Arafat and secondly due to traffic crowdness. Only six patients readmitted from the area either due to their premature discharge or any other health related complication.

This area helped in reducing the bed occupancy rate of Al-noor Hospital from 29-11-1427H to 20-12-1427H. As occupancy rates above 85%, risks become discernible, and above 90% the hospital system is subjected to regular bed crises [11]. So this area indirectly reduced the hospital acquired infections especially methicilline-resistant staphylococcus aurous (MRSA) which has a strong relation with bed occupancy rate above 85% [12], cross infections and inpatient length of stay of Hajjes as well as local patients by preventing them from these infections so that Hajj and non-Hajj patients could get safe management especially in post-operative cases, in this critical and overcrowded time period.

Limitations

Our study was of short duration with the primary issue of Mutahassaneen Area which covers only 21 days of Hajj season. It did not highlight the reasons of prolonged stay in area that might reflected Hajj mission responsibilities concerning in receiving their patients earlier, traffic jam, lack of communication etc. It also didn't focus in detail upon complications happened with the subjects while waiting in the Area as well as its other aspects of usage, ie triage area.

Conclusion

This area facilitated the approach of discharged Hajj patients to their respective mission in an easy, safe

and urgent way. It helped the hospital to face and handle patients' overcrowding. Indirectly it facilitated inpatients' hospital beds availability for incoming new patients.

References

1. Memish ZA, Venkatesh S, Ahmad QA. Travel epidemiology: the Saudi perspective. Int J Antimicrob Agents. 2003:21(2):96-101. doi:10.1016/S0924-8579(02)00364-3 PMID:12615370.

2. Shakir HAS, Gazzaz ZJ, Dhaffar KO, Shahbaz J. Outpatient services during (1423h) Hajj Season. Sul Qab Med Uni J. 2006;6(1):47-50.

3. Elhassan OM, Hameed MIS. The pattern of general surgical problems among pilgrims admitted to King Fahd hospital: Madina Al-Munawarah in 1987. Saudi Med J. 1990;4:290-292.

4. Yousaf M, Zafar MO, Maqbool M. Medical problems of Pakistani pilgrims in Saudi Arabia. Pak J Med Res. 1993; 32:172-175.

5. Gazzaz ZJ, Dhaffar KO, Shahbaz J. Hajj (1422H) In-patient Characteristics in Al-Noor Specialist. Kuwait Med J. 2004; 36(4):279-80.

6. Gallagher EB, Searle CM. Health services and political culture of Saudi Arabia. Soc Sci Med. 1985;21(3):251-62. doi:10.1016/0277-9536(85)90099-1 PMID:4035414.

7. A comprehensive account of all aspects of the Hajj and Umrah, the journey of a lifetime: The ministry of Hajj-Designations and definitions. [Online]. Available from: URL: http://www.hajjinformation.com/main/m701.htm

8. International Statistical Classification of Diseases and Related Health Problem. 10th Version, Vol. 2. Geneva: WHO; 1992.

9. Al-Ghamidi SM, Akbar HO, Qari YA, Fathaldin OA, Al-Rasheed RS. Pattern of admission to hospitals during muslim pilgrimage (Hajj). Saudi Med J. 2003;24(10):1073-76. PMID:14578971.

10. Dhafar KO, Gazzaz ZJ, Shahbaz J. Hajj Carvan 1423. Saudi Med J. 2004;25(10):1529.

11. Bagust A, Place M, Posnett JW. Dynamics of bed use in accommodating emergency admissions: stochastic simulation model. BMJ. 1999;319(7203):155-8. PMID:10406748.

12. Cunningham JB, Kernohan WG, Rush T. Bed occupancy, turnover intervals and MRSA rates in English hospitals. Br J Nurs. 2006;15(12):656-60. PMID:16835541.