

Pattern of Common Diseases in Hospitalized Patients at an University Hospital in Saudi Arabia; A Study of 5594 Patients

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Abstract. To assess the prevalence and the pattern of medical disorders by affected system among patients admitted with medical disorders; to determine the frequency of the most common diagnoses and the length of stay for hospitalized patients. The records of 5594 hospitalized with common medical diseases were analyzed from January 2000 to December 2005. From the patients' medical records; age, sex, and nationality, admission and discharge diagnoses, associated diseases, and length of stay in hospital were obtained. 54% were males and 44% were Saudis. The majority was in the age group of 46 - 65 years (38.0%). Cardiovascular was the most commonly affected system (19.9%), followed by respiratory (14.5%). *Diabetes mellitus* (10.5%), ischemic heart disease (8.6%) and bronchial asthma (5.8%) were having the highest frequency among hospitalized patients. The most affected age groups were 46 - 65 followed by 26-45 except for hematology where the most affected age group was 13 - 25 year ($p < 0.001$). Overall mean length of stay was 8.3 ± 6.3 days. In the Kingdom of Saudi Arabia, similarly to the West, cardiovascular and respiratory diseases were the most affected systems while diabetes, ischemic heart disease and bronchial asthma were leading causes of hospitalization.

Keywords: Medical diseases, Disease pattern, Length of stay, Hospital admission, Saudi Arabia.

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Accepted for publication: 6 July 2009. Received: 23 April 2009.

Introduction

Today, chronic diseases such as cardiovascular disease (primarily heart disease and stroke), cancer and diabetes are among the most prevalent health problems worldwide^[1,2]. However, it is believed that the pattern of medical diseases in developing countries is different from that of the developed ones^[1-5]. For instance, in Sri Lanka, the leading causes of hospitalization were traumatic injuries, respiratory diseases, viral illnesses and diseases of gastrointestinal (GIT) system, while the leading causes of death were ischemic heart disease, disease of GIT and cerebrovascular accident^[3,4]. Contrary to that, in Canada, cardiovascular disease, cancer and respiratory disease were the most common causes of hospitalization and death among Canadians in 1998 to 1999^[2]. In Saudi Arabia (KSA), as well as, other developing countries the pattern of chronic medical diseases causing illnesses and hospitalization has not been well studied and mostly is unknown. In KSA, the only available surveys were about tuberculosis and cancer incidence report in 1999-2000 by the Ministry of Health^[5,6]. Therefore, the objectives of this study are to assess the prevalence and the pattern of medical disorders by the affected system among patients hospitalized with medical diseases. To determine the frequency of the most common diagnoses and the length of stay for hospitalized patients. This study is important as it is the first large epidemiological one, particularly in this part of the world.

Patients and Methods

A total of 5594 hospitalized patients were studied and analyzed for age, sex and nationality. The main causes of hospital admission and other associated diseases were coded according the International Classification of Diseases (ICD) 10th version. The medical records were reviewed by the authors for all patients hospitalized from January 2000 till the end of December 2005, at the medical wards in King Abdulaziz University Hospital (KAUH). The study has been approved by the medical ethical committee. KAUH is a general teaching hospital in the western region of Saudi Arabia with a total capacity of 800 beds, 250 of which are allocated for internal medicine. It is major referral center providing a tertiary care for patients in the western province of Saudi Arabia. The catchments area of the hospital is about 350,000 people. The medical wards consist of two separate units for men and women. The Department of Medicine provides services in all internal medicine

subspecialties including cardiology, pulmonary, gastroenterology, neurology, oncology, endocrinology and metabolism plus rheumatology and hematology. In addition to a nephrology unit with a capacity of 20 dialysis machines as well as the intensive care unit (ICU) with a capacity of 25 beds for all specialties. Admissions take place either through emergency room (ER), which is open 24 hrs or from daily outpatient clinics. The average rate of admissions in the medical wards is 6-10 patients per day. The prevalence and pattern of most common medical disorders are unknown in Saudi Arabia. All patients who need medical admission were included. The patients were coded by name, therefore one patient admitted twice or more with same condition was counted as one case of the condition.

Data Collection

A structured form was used to collect information from patients' medical records including demographic data (such as age, sex, and nationality). The main causes of hospital admission and other associated disease were coded according to the International Classification of Diseases - 10th revision, also used for calculations. All ethical issues concerning data handling and patient records were taken into consideration, as the consultants had agreed to review the medical records of their own patients included in the study.

Statistical Analysis

Data were entered and analyzed using SPSS package (Release 10.01, 1999). Descriptive statistics were performed as appropriate including frequencies, mean \pm standard deviation and cross tabulations. Statistically significant was set at < 0.05 throughout the analysis.

Results

A total of 5594 hospitalized patients admitted to medical wards were reviewed. About 54% were males and mean age \pm SD was 47.7 ± 18.3 with range from 13 years to 95 years. The age group distribution is shown in Table 1. The majority were in the age groups, 26-45 and 46-65 years, 30.7%, and 38.0%, respectively. Saudis accounted for 44% of the hospitalized patients followed by Yemenis, Palestinians, Sudanese, and Egyptians as shown in Table 1. The most commonly affected systems among them were Cardiovascular (19.9%), followed by respiratory

(14.5%), hematological (12.7%), endocrine and metabolism (12.2%) as shown in Fig. 1. The sixteen most frequent diseases encountered were shown in Table 2, in which *diabetes mellitus*, ischemic heart disease, and bronchial asthma were at the top of the list. Figure 2 shows the distribution of hospitalized patients by affected system and sex. Most of the systems showed higher frequency among males than females with the exception of endocrine and rheumatology disorders. Figure 3 shows the distribution of hospitalized patients by affected system and nationality. Among Non-Saudis, oncology, hematology and nephrology disorders were much more common among Saudis. The distribution of hospitalized patients by affected systems and age group was shown in Fig. 4. In most systems, the age groups mostly affected were 46-65 followed by 26-45 years except for hematology where the most affected age group was 13-25 years. All the above differences were statistically significant ($p < 0.001$). Most of hospitalized patients (69.2%) didn't have an associated co-morbidity and only 2.3% had 3 associated co-morbidity or more as shown in Table 3. About 17% of the patients had cardiovascular disease as an associated condition followed by endocrine and metabolic disorders (8%); infectious diseases (4.7%) and respiratory disease 3.3% as shown in Table 4. Table 5 shows that the overall mean length of stay of all patients was 8.3 ± 6.3 days. Infectious diseases (9.2 ± 6.9), oncology (9.1 ± 7.5), and respiratory disease (8.9 ± 6.3) had the highest mean length of stay while gastrointestinal disorders had the lowest mean length of stay (6.7 ± 6.4 days).

Table 1. Distribution of hospitalized patients by age group and nationality.

	No	%
Age Group		
13 – 25 Yrs	795	14.5
26 - 45 Yrs	1686	30.7
46 - 65 Yrs	2090	38.0
>65 Yrs	923	16.8
Nationality		
Saudi	2464	44.0
Yemeni	964	17.2
Palestinian	435	7.8
Sudanese	325	6.3
Egyptian	232	4.1
Pakistani	199	3.6
Somali	175	3.1
Indian	90	1.6
Others	683	12.2

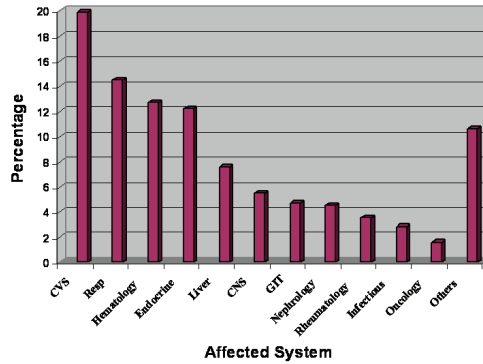


Fig. 1. Distribution of hospitalized patients by the affected system.

Table 2. Ranking of the 16 most frequent diagnoses among hospitalized patients.

Diagnosis	No.	Percent (%)
Diabetes mellitus	570	10.5
Ischemic heart diseases	493	8.6
Bronchial asthma	311	5.8
Chronic liver disease	293	5.4
Congestive heart failure	203	3.8
Hypertension	153	2.8
Sickle cell anemia	141	2.6
COPD	132	2.4
Chronic renal failure	116	2.1
Cerebrovascular accident	108	2.0
Hodgkin's lymphoma	92	1.7
SLE	85	1.6
Rheumatoid arthritis	69	1.3
Cancer colon	67	1.2
Deep veins thrombosis	64	1.2
Pyrexia of unknown origin	59	1.1
Total	2956	

COPD = chronic obstructive pulmonary disease, SLE= systemic lupus erythematosus.

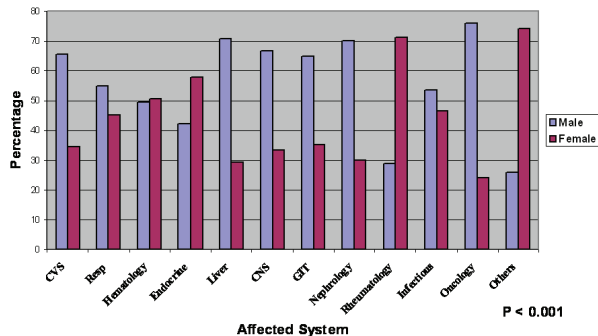


Fig. 2. Distribution of hospitalized patients by affected system and sex.

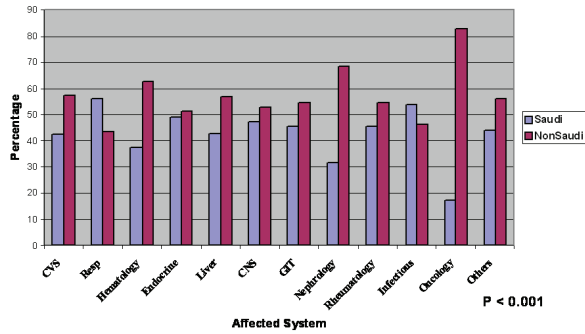


Fig. 3. Distribution of hospitalized patients by affected system and nationality.

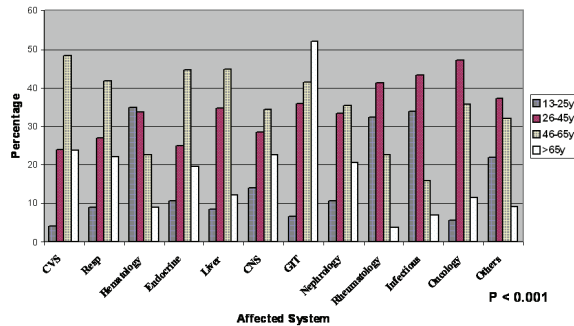


Fig. 4. Distribution of hospitalized patients by affected system and age group.

Table 3. Percentage of associated diseases in hospitalized patients with medical disorder

Status	NO	Percent (%)
No associated disease	3870	69.2
One associated disease	1063	19.0
Two associated diseases	531	9.5
Three associated diseases	122	2.2
Four associated diseases	8	0.1

Table 4. Percentage of the associated condition in 5594 patients hospitalized with medical disorder.

Condition	Percent (%)
Cardiovascular disease	16.9
Endocrine disorder	8.0
Infectious disease	4.7
Respiratory disease	3.3
Nephrology disorder	1.9
Hematology disorder	1.8
Liver disease	1.7
Neurology disorder	1.6
Oncology condition	1.2
Gastrointestinal disease	1.1
Rheumatology condition	0.04

Table 5. Length of stay in hospital of all patients*.

Length of Stay	Percent (%) of Total Patients
1-7 days	48
8-14 days	30
15- 30 days	19
Over 30 days	2.7

*Mean length of stay of all patients was 8.3 ± 6.3 days

Discussion

Saudi Arabia is a rapidly developing country where most citizens and expatriates live a western like style. The diet increased from the simple natural diet of the bedouin to the complex fatty diet. Therefore, it is not surprising that western diseases such as diabetes, cardiovascular disorders and bronchial asthma head the list of the common diseases among hospital admissions. Diabetes seems to be even more prevalent than expected because commonly marrying from the same family, and the worldwide surge Type II *diabetes mellitus*^[8,9]. Cardiovascular diseases have risen because of the western life style among the middle classes and smoking among the working classes^[10,11]. In addition to hypertension which is the sixth most common disease in this study. Bronchial asthma is the third most common cause of admissions because of pollution from cars, the increasing number of cars and factories as seen in many other countries^[12,13].

About half the admissions were Saudis reflecting the large population of expatriates living in the Kingdom headed by Yemenis due to historical and geographical ties between the two countries. It is worth noticing that oncology followed by nephrology and hematology disorders were much more common in expatriates than in Saudis. Perhaps, is due to the more widespread presence of carcinogens in the developing countries where most expatriates come from. Also, poor primary healthcare in those countries could account for the large nephrology peak among expatriates. Hodgkin's lymphoma and colonic cancer were the two most common malignancies in this part of the world (about 3% of all admissions). The prevalence of disorders by system in this study was higher among males than females, except for the rheumatology and endocrine disorders. Systemic lupus erythematosus (SLE) and rheumatoid arthritis were the two most common rheumatology diseases in this study (about 3% of all admissions) occurring mainly in females as reported in other studies^[14,15].

On the other hand, the high male prevalence in most of the other disorders should be interpreted with the knowledge that the large majority of expatriates in this part of the world is made of male workers without their families. Infections are a common cause of admissions in developing countries^[16,17]. In this study infections are not prominent because infectious cases are admitted to specialized units in other hospitals. Pulmonary tuberculosis was at the top of the list of the infectious cases in our hospital, with lymphoma, they both were the underlying cause of most cases of pyrexia of unknown origin in this study.

This report is important as it has reflected the pattern of hospitalization in a wide region of KSA. However, it has some limitations in a way that it was a retrospective study and the morbidity pattern was slightly limited to rather selected spectrum of disease severity, and the fact that it was not a multicentre study. In conclusion, this study throws some light on the pattern of diseases in the western region of Saudi Arabia hitherto unknown. In some aspects, the pattern of disease is similar to the West; but in other aspects it is different^[18]. More studies are needed in this field.

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نمط الأمراض الشائعة في المملكة العربية السعودية دراسة لـ ٥٥٩٤ حالة منومة في المستشفى الجامعي

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المستخلص. لتحديد أهم الأجهزة ونوع الأمراض الباطنية الشائعة حسب الإصابة بها، وتحديد مدة بقاء المريض حسب المرض المصاب به، فقد تم مراجعة سجلات "٥٥٩٤" مريضاً نوموا بأمراض باطنية بمستشفى جامعة الملك عبدالعزيز بجدة لمدة ٥ سنوات في الفترة بين يناير ٢٠٠٠م إلى ديسمبر ٢٠٠٥م، كما تم تعبئة استبيان لجمع المعلومات المختلفة عن المريض، وكانت النتائج كالتالي: نسبة الرجال ٥٤٪، منهم ٤٤٪ سعوديين، وكانت أكبر المجموعات العمرية ما بين ٤٦ - ٦٥ سنة (٣٨,٠٪)، وقد كانت أمراض الجهاز الدوري والقلب هي الأعلى حيث بلغت نسبة الإصابة ١٩,٩٪، وتلتها أمراض الجهاز التنفسي بنسبة ١٤,٥٪. كما كانت أمراض السكر، وقصور القلب، ومرض حساسية الصدر هي أهم ثلاث أمراض مسببة لدخول المستشفى حسب النسب الآتية على التوالي: (١٠,٥٪)، و(٨,٦٪)، و(٥,٨٪)، وكانت مدة بقاء المريض في المستشفى $8,3 \pm 6,3$ يوماً.

وبالتالي فإن أكثر الأمراض انتشاراً في المملكة العربية السعودية تشابه مثيلاتها في الغرب، حيث أن أمراض الدورة الدموية والقلب وأمراض الجهاز التنفسي تعتبر الأعلى للمرضى الذين أدخلوا للمستشفى، وتعتبر أمراض السكر والقصور القلبي وحساسية الصدر هي الأكثر سبباً لدخول المستشفى.