

## Medical Admissions and the Role of Patient Non-Compliance

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**Objective:** Study the admission patterns of medical inpatients over a period of one month, to find out the sources of these admissions, their reasons and their appropriateness.

**Design & Setting:** A prospective study analysis of medical admissions at the Accident and Emergency Department (AE), Salmaniya Medical Centre, Bahrain was carried out to evaluate the frequency and reasons for medical admissions and any attributable causes for repeated admissions in some patients.

**Results:** Eighty six percent of all medical admissions were through the AE and 14 % through the general and private clinics. Sixty six percent of medical admissions through the AE were first acute admissions and 34 % were repeat admissions for exacerbations of chronic illnesses. 67.8 % of repeat admissions were due to unavoidable reasons like intractable or progressive disease or the onset of precipitating events like infections. However nearly one third (28.2 %) of repeat admissions and thus 9.5 % of total admissions were related to non-compliance with medication on the part of the patient.

**Conclusion:** The 9.5 % of total medical admissions related to noncompliance are potentially avoidable. This could be achieved by patient health education, and increased coordination between the hospital the local health centres and the social welfare offices.

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Salmaniya Medical Centre (SMC) is a referral and acute care hospital open to the general public in Bahrain. Out of a total of 626 beds, the Department of Medicine has an allotted bed capacity of 162 (25.9 %). There is often a spillover of medical patients onto other areas, because admission of sick patients presenting at the AE Department cannot be refused even if medical beds have been occupied. According to the 1994 hospital admission statistics, medical admissions accounted for 27.3 % of total hospital admissions (6329 out of 23170) over the year<sup>1</sup>. With this over-occupancy, a shortage of medical beds is always felt by the clinicians, despite attempted high turnover rates. One of the reasons for this shortage could be unnecessary or avoidable admissions to the medical wards. The Audit Commission studying the effective and efficient use of hospital beds in Britain found that there were a large number of inappropriate admissions due to unclear protocols, inexperienced duty teams and admissions when only observation was required<sup>2</sup>.

In order to find the extent of any avoidable or unnecessary medical admissions we studied the admission patterns of medical inpatients over a period of one month. We studied the percentage of patients admitted to medical wards through the Emergency Department or through other sources, and compared it with previous year

admission statistics and figures for other hospital departments. We also analysed the nature and causes of emergency admissions and the reasons for avoidable admissions, if any.

### METHODS

According to 1994 medical admission statistics, the number of medical admissions ranged from 488 in June to 541 in December, with an average of 527. The month of July with 531 admissions closely represented the average monthly admissions. For this reason the month of July 1995 was selected for the study. To find out the total medical admissions for the month of July and their sources, we analysed the computer data of the hospital Admission Records Bureau for patient parameters, the date of admission, source of admission, admission diagnosis, specialty under which the patients were admitted and the discharge date.

For all medical admissions through the AE department, an additional proforma was filled recording the reason for emergency admission, primary diagnosis and in case of new patients whether referred or walk-in, and in case of old patients, the reason for repeat admissions. 25 % of these proformas were then randomly collected and analysed to find out the diagnosis of acute first admissions and also diagnosis and causes of repeated admissions.

### RESULTS

There were 2167 hospital admissions during the month of July 1995 and out of these 523 (24.1 %) were medical admissions, 259 in the first 15 days and 264 in the later 16 days.

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Of the 523 admissions, 75 (14 %) were through the out patient clinics and 448 (86 %) through the AE department. During the study period, the total hospital admissions were 2167, and out of this, 1333 (61.5 %) were through the AE. Of the 448 medical admissions through the AE, a simple random sample of 115 patient files with completed proformas was analysed for the reasons of first acute admissions and of repeated admissions. Of the 115 patients, 76 (66 %) were new admissions and had not been admitted for the same problem before and 39 (34 %) were old patients admitted before for similar problem like the present admission and were called repeat admissions.

The 76 first admissions were analysed for the reasons for emergency admissions. These reasons were grouped according to the main diagnosis or the major system involved at the time of admission (Table 1).

**Table 1. Data analysis of first acute hospital admission through the AE Department**

| <i>Diagnosis</i>                               | <i>No</i> | <i>%</i> |
|--|-----------|----------|
| Acute myocardial infarction or unstable angina | 20        | 26.4     |
| Acute stroke                                   | 12        | 15.8     |
| Upper GI bleeding/hepatitis or Cirrhosis       | 11        | 14.5     |
| Fever for investigations                       | 8         | 10.5     |
| Bronchial asthma / chronic bronchitis          | 7         | 9.2      |
| Drug overdose                                  | 5         | 6.6      |
| Anaemia  | 2         | 2.6      |
| Diabetic ketoacidosis                          | 1         | 1.3      |
| Chronic renal failure                          | 1         | 1.3      |
| Others   | 9         | 11.8     |

The 39 patients with repeated admissions were also analysed for their admission diagnoses (Table 2).

**Table 2. Data analysis of patients with repeated hospital admissions through the AE Department**

| <i>Diagnosis</i>  | <i>No</i> | <i>%</i> |
|---|-----------|----------|
| Ischaemic and rheumatic heart disease/ cardiomyopathy   | 13        | 33.3     |
| Sickle cell disease - crises                            | 12        | 30.7     |
| Diabetic complications                                  | 4         | 10.2     |
| Cor pulmonale/ lung cancer/ chronic respiratory failure | 4         | 10.2     |
| Epilepsy, paraplegia                                    | 2         | 5.1      |
| Duodenal ulcer/ liver disease                           | 2         | 5.1      |
| Others  | 2         | 5.1      |

Of the 39 patients with repeated admissions 25 (64 %) fell into two groups, the cardiac patients and those with sickle cell disease who repeatedly came with vaso-occlusive crises precipitated by fevers, infection or dehydration. The reasons for repeated admissions of these patients were analysed (Table 3).

**Table 3. Reasons for repeated admissions through the AE Department**

| <i>Reason</i>   | <i>No</i> | <i>%</i> |
|---|-----------|----------|
| Precipitating event like anaemia, infection in sickle cell disease, chronic respiratory disease                   | 17        | 43.6     |
| Non compliance with medication: stopping drugs, missing clinic appointment in heart disease and diabetes mellitus | 11        | 28.2     |
| Intractable disease: carcinoma/ chronic renal failure/ advanced liver disease                                     | 7         | 17.9     |
| Progressive disease - coronary artery disease   | 4         | 10.2     |

## DISCUSSION

Medical admissions make up 27 % of total annual hospital admissions at SMC according to 1994 statistics. Of these, 90 % of medical admissions were through the AE department and 10 % through the outpatient department and private clinics. These figures correspond well with our study figures for July 1995 in which 86 % of medical admissions were through the AE department and 14 % through the clinics. Medical admission trends match closely with Paediatric admissions (17.5 % of total hospital admissions), where 86 % of admissions are through the AE department and 14 % through the clinics<sup>1</sup>. On the other hand, surgical admissions (20.4 % of total hospital admissions) are 49 % through the AE and 51 % through the clinics<sup>1</sup>.

Why medical admissions are largely through the AE is dependent on the patient referral patterns from different sources. In a previous study from our institution, it was found that 84 % of the AE attendance was through self-referrals, 12 % were referred from the General Practitioners of health centres, 2 % from private clinics, and 1 % each from another hospital or brought from home by the ambulance<sup>3</sup>.

Only 6.8 % of the patients attending the AE were admitted and 2.5 % were taken to the Day Case Unit<sup>3</sup>. 74 % of these attending the A/E department were found to be non-urgent patients who could easily be managed at the local health centres. The six observation beds attached to the AE department helped us to minimise admissions on such cases like mild sickle cell crisis and minor infections.

In our study in 28.2 % of recurrent admissions and thus 9.5 % of total admissions were due to patient non-compliance with prescribed medicines and appointments. Previous studies suggest that approximately 50-60 % of patients are not compliant with medications<sup>4</sup>. From patient proformas we found that the non-compliance was attributed to several causes. Finishing medicine available



at home due to short supply from the pharmacy, inability to reach hospital on appointment date or to collect a refill of prescription was applicable in dependent and elderly patients who needed someone else (eg. a working family member) to bring them to the hospital. Some stopped medications as they felt improved while others stopped medicines because of their unpleasant side effects.

Levy et al<sup>5</sup>, found that in 2.9% of their medical admissions, non-compliance with drug therapy was the principal factor leading to hospitalisation. The reasons given by patients for non-compliance were the occurrence of adverse reaction (39 % of the cases) lack of symptoms (19 %) too many drugs (16 %), and forgetfulness (10 %).

Patient compliance with medication has been shown by Homedes<sup>6</sup> to be dependent on several variables like, (a) patient variables, (b) disease variables, (c) treatment variables, (d) patient health care provider interaction and (e) organisational factors. All of these factors need to be considered in each case of non-compliance, so that preventive action can be taken to avoid its recurrence.

## CONCLUSIONS

**In this study 9.5 % of all medical admissions were related to patient non-compliance with medications and appointments. Patient health education, flexible appointment system and coordination and cooperation between hospital and local health centre doctors and social welfare officers can effectively reduce the degree of non-compliance and hence improve the hospital bed utilisation and patient care in general.**

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