Morbidity profile of admissions to GF Jooste Hospital, Manenberg, Cape Town

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Abstract

Background

Secondary hospitals play an important, yet overlooked, role in reflecting public health status, both locally and nationally. Relatively few reports analysing the causes of secondary hospital admissions exist, which is especially unfortunate in the case of developing countries, considering the huge numbers of admissions and people at risk. In developing countries like South Africa, the quality of records varies among institutions. Some hospitals have computerised data, while others may keep no records whatsoever. A major problem facing the quality of hospital records is the constant shortage of staff in rural and urban hospitals. Thorough documentation is essential in providing an invaluable database for researchers, but morbidity statistics are unfortunately scarce.

GF Jooste Hospital in Manenberg is the busiest hospital in Cape Town – serving 1.1 million people, with 224 beds and over 12 000 admissions annually. Budgetary constraints in the South African public health sector means that providing healthcare services at higher levels than necessary is too costly. Because hospitals consume the largest share of the public healthcare budget, they have been the focus in cost cutting. In particular, the budgets of referral (tertiary or teaching) hospitals have been trimmed in order to promote primary and secondary care. It is imperative to identify those services that are required most at secondary hospitals in order to improve budgeting and, more appropriately, train doctors and medical students for the job at hand. Identifying the morbidity profile of the population for which the hospital caters can aid the optimal utilisation of the available resources, as well as focusing the continuing medical education of hospital physicians. We determined disease patterns of admissions over a three-year period (2001-2003), primarily as insight towards optimal hospital resource management.

Methods

A retrospective study examined ward records, totalling 36 657 admissions, from which a random sample (N=608) was selected. A stratified sample (N=462) was constructed, considering the relative proportions admitted to the wards. The International Statistical Classification of Diseases (ICD) directed diagnosis sorting. Disease prevalence was expressed as the percentage of patients allocated to each ICD category among those admitted to the hospital and respective wards and, additionally, the percentage of diagnoses for each ICD subcategory among patients assigned to each major category.

Results

Trauma (represented by ICD categories S/T 23% and V/X/Y 16%), specifically assault-related, was most prevalent. This was followed by circulatory diseases (22%) and infectious diseases (19%), dominated by HIV (61%) and associated diseases like TB (57%). The age of the patients ranged from 13 to 87 (mean: 40 years), with the 20 to 30-year-olds predominating. Surgical patients were younger (mean: 35 years) than medical (mean: 45 years). In the medical wards, infectious (39% in men; 38% in women) and circulatory aetiologies (39% and 41% in men and women respectively) dominated. In the surgical wards, the trend varied according to sex: assault (43%) and other injuries (61%) for males; pregnancy-related (42%) for females.

Conclusion

The morbidity distribution reflects the ills affecting South African urban society, with young trauma admissions predominating. The hospital's budget is insufficient, considering its population's demands.

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Introduction

Secondary hospitals play an important, yet overlooked, role in reflecting public health status, both locally and nationally. Relatively few reports analysing the causes of secondary hospital admissions exist, which is especially unfortunate in the case of developing countries, considering the huge numbers of admissions and people at risk.[1,2,3,4,5,6,7,8,9,10,11,12,13,14]

In developing countries like South Africa, the quality of records varies among institutions. Some hospitals have computerised data, while others may keep no records whatsoever. A major problem facing the quality of hospital records is the constant shortage of staff in rural and urban hospitals. Thorough documentation is essential in providing an invaluable database for researchers, but morbidity statistics are unfortunately scarce.

GF Jooste Hospital is a secondary hospital in the south-east of Cape Town. Up until 1996, it had served as a recovery and rehabilitation hospital for the Groote Schuur (GSH) and Conradie Hospitals. In 1996, the emergency department was opened, with medical and surgical beds for adult patients (over 13) only. Since then, it has been one of the busiest hospitals in the city. The approximately 1.1 million people served by the hospital comprise an urban population of black, coloured and Indian people who come from the communities of Mitchell's Plain, Philippi, Guguletu, Crossroads, Khayelitsha, Strandfontein, and Nyanga.[18] Patients are referred by community clinics, day hospitals and private general practitioners. The hospital has a total bed capacity of 224, of which 40, reserved for chronically ill patients, are located at Lentegeur Hospital.

At present, there are four major departments in the hospital: emergency, medical (with a separate stroke unit), surgical, and orthopaedics (with an operating theatre that runs 24 hours a day). In addition, a small gynaecological department, including management of early pregnancy (first trimester only), was created recently. Patients are admitted to male and female general medical wards, male and female general surgical wards, and a high-care unit. Orthopaedics and gynaecology patients are admitted to surgical wards.

The doctors in the emergency department are mostly community service medical officers, although there are some permanent medical officers. The medical officers in the other departments are rotating registrars from GSH. Growing cooperation between the University of Cape Town (UCT) and GSH has changed the pattern of services at GF Jooste, which is now used to train medical students and registrars from the medical, surgical and gynaecological departments of UCT, thus providing some tertiary hospital services without, however, the appropriate financial resources.

Budgetary constraints in the South African public health sector means that providing healthcare services at higher levels than necessary is too costly. Because hospitals consume the largest share of the public healthcare budget, they have been the focus in cost cutting.[18] In particular, the budgets of referral (tertiary or teaching) hospitals have been trimmed in order to promote primary and secondary care. It is imperative to identify those services that are required most at secondary hospitals in order to improve budgeting and, more appropriately, train doctors and medical students for the job at hand. Identifying the morbidity profile of the population for which the hospital caters can aid the optimal utilisation of the available resources, as well as focusing the continuing medical education of hospital physicians.

Thus, the aim of this study was to determine the ages and causes of admission to GF Jooste Hospital over a three-year period from 2001 to 2003. The admission data were categorised with respect to the hospital as a whole, as well as each of the hospital's wards respectively.

Methods

A retrospective study was performed using data from the ward admission books, which are routinely completed on admission by the ward sisters. Specifically, the initial diagnosis is recorded and never revised. In the specified three-year period, there were 36 657 admissions to the five different wards in total, from which a random sample of 608 admissions was selected. In order to form a representative picture of total admissions, a stratified sample of 462 admissions was then constructed, as in Table I, to reflect the actual percentage of admissions to the respective wards:

Table I: Sample construction

Random sample	Ward	% of admissions	Stratified sample (N)
129	high-care patients	9	42
120	medical female patients	22	102
119	medical male patients	18	85
120	surgical male patients	26	120
120	surgical female patients	25	113
608	total hospital admissions	100	462

Table II. International Statistical Classification of Diseases (ICD) Categories[18]

ICD Symbol	Disease Category
A or B	Infectious and parasitic diseases
C	Malignant neoplasms
D	Anaemia
E	Endocrine, nutritional, and metabolic diseases
F	Mental and behavioural disorders
G	Disease of the nervous system
I	Disease of the circulatory system
J	Disease of the respiratory system
K	Disease of the digestive system
L	Disease of the skin and subcutaneous tissue
M	Diseases of the musculoskeletal system and connective tissue
N	Diseases of the genitourinary system
O	Pregnancy, childbirth, and the puerperium
R	Symptoms and signs involving the urinary system
S or T	Injury, poisoning, effects of foreign bodies, burns and corrosions, frostbite, and complications of certain medical or surgical procedures
V or X or Y	Transport accident, other accidental injury, assault or self harm, and other external causes of injury

Age, gender, and discharge diagnosis were recorded, followed by coding each of the discharge diagnoses according to the International Statistical Classification of Diseases (ICD), as in Table II.[15] The ICD codes were then analysed using the Statistica 6 software package.[16] Since more than one diagnosis per patient was frequent, the total number of diagnoses was greater than the total number of admissions. Consequently, one patient could be represented across several ICD categories simultaneously. The distribution of diagnoses was expressed as the percentage of patients in the hospital and in each ward respectively who were assigned to each major ICD category. The data were further categorised according to the percentage of diagnoses of each disease subcategory occurring within the pool of patients falling within each major ICD category.

Results

A total of 36 657 patients were admitted to all the wards during the three-year period. Their ages ranged from 13 to 87, with a mean average age of 40. The highest number of admissions came from the 20 to 30-year-old age group. The general trend was that admissions to high-care units and medical wards were mostly people in the age group over 40, while admissions to surgical wards were under 40 years old (see Table III).

All wards taken together

The five most common admissions to the hospital, based on the

Table III. Age distribution of admissions at GF Jooste Hospital 2001-2003 based on the stratified sample (N=462)

Ward1	AGE Mean	N	AGE Std Dev	AGE Min	AGE Max
High-care	47	42	17	13	84
Medical (male)	47	85	17	13	87
Medical (female)	43	102	16	14	84
Surgical (male)	36	120	16	14	85
Surgical (female)	35	113	16	14	85
All Groups	40	462	17	13	87

stratified sample, are as follows (see Figure 1):

1. Injury, poisoning, effects of foreign bodies, burns and corrosions, frostbite, and complications of certain medical or surgical procedures (23%; 95% CI: 20%-27%), composed of the following main subcategories:
- open wounds to thorax (26%; 95% CI: 19%-37%)
- head injury (13%; 95% CI: 7%-21%)
- fracture of the lower leg, including ankle (13%; 95 % CI: 7%-21%)
2. Diseases of the circulatory system (22%; 95% CI: 18%-26%), composed of the following main subcategories:
- hypertensive heart diseases (29%; 95 % CI: 20%-38%)
- heart failure (23%; 95 % CI: 15%-31%)
- stroke (22%; 95 % CI: 14%-30%)
- angina pectoris (21%; 95 % CI: 13%-29%)
3. Certain infectious and parasitic diseases (19%; 95% CI: 16%-23%), composed of the following main subcategories:
- human immunodeficiency virus (HIV) (61%; 95 % CI: 45%-63%)
- pulmonary tuberculosis (57%; 95 % CI: 42%-60%)
- gastroenteritis (13%; 95 % CI: 6%-18%)
4. Transport accidents, other accidental injury, assault or self-harm, and other external causes of injury (16%; 95% CI: 13%-20%)
5. Endocrine diseases (12%; 95% CI: 9%-15%)

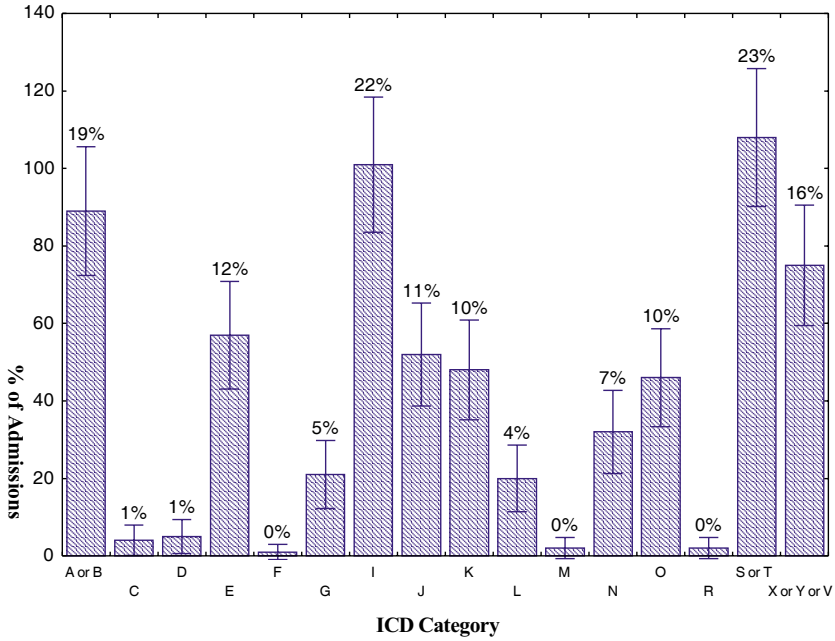
*The proportions shown on the graphs are estimated proportions based on the stratified sample of patients. The error bars shown on the graph are 95% confidence intervals of the calculated proportions, which mean that the probability is 0.95 for the actual proportion for the whole hospital to lie between the boundaries indicated by the error bars.

High-care units

Males were most frequently admitted to high-care units for disorders of the circulatory system (42%), followed by assault-related reasons (28%) and endocrine and metabolic diseases (27%).

Females were mostly admitted to high care also for diseases of the circulatory system (52%), followed by endocrine (38%) and respiratory (20%) diseases. Assault accounted for only 11% of admissions.

Figure 1. Disease patterns of admissions to GF Jooste Hospital (2001 – 2003) based on the stratified sample (N=462)*



Medical wards

Male admissions to medical wards were mostly on account of circulatory disorders (39%) and infectious diseases (39%), followed by respiratory system (25%) and nervous system (12%) diseases. Likewise, admissions to female medical wards showed that the most common reasons for admission were circulatory disorders (41%) and infectious diseases (38%). Other common disease categories for women were respiratory (21%), endocrine (16%), and genitourinary (12%) disorders.

Surgical wards

Males were most commonly admitted to surgical wards for injury, poisoning, effects of foreign bodies, burns and corrosions, frostbite, and complications of certain medical or surgical procedures (61%); transport accidents, other accidental injury, assault or self-harm, or other external causes of injury (43%); and diseases of the digestive system (20%). Females were most commonly admitted on account of pregnancy-related indications (42%), such as spontaneous abortions and ectopic pregnancies; injury, poisoning, effects of foreign bodies, burns and corrosions, frostbite, and complications of certain medical or surgical procedures (24%); and diseases of the digestive system (14%).

Discussion

The results indicate that circulatory system disorders and infectious diseases dominated the medical admissions, while trauma and other injury dominated the surgical admissions. These results are in line with other studies of hospital admissions in cities and towns, where the increasing urbanisation and westernisation of the population is changing the morbidity pattern of diseases.[3,4,12,13]

In a Baragwanath Hospital (Soweto) study, the most common reasons

for admissions to adolescent wards were pregnancy, injury and trauma.[7] In another study, admissions to medical wards at Hillbrow Hospital were most frequently associated with the circulatory system (27.9%), followed by respiratory (15.9%) and infectious diseases (11.9%).[12] Infectious diseases and trauma were shown to be the main causes for admission to medical wards in certain rural hospitals (Murchison[10] and Gelukspan[11] Hospitals). In a study of a rural hospital in the Limpopo Province, it was found that hypertension (19%), followed by pulmonary tuberculosis (10%), accounted for most admissions.[14] An examination of medical ward admissions to Groote Schuur Hospital in 1982 showed a preponderance of circulatory system (42.8%) pathology, followed by endocrine, nutritional and metabolic disorders (11.25%) and infectious diseases (7.4%).[13]

Similar studies have also been conducted elsewhere in Africa. For example, in a study of surgical admissions in Kenya, trauma was also found to be the main reason.[17] The most common injuries were soft tissue injuries, fractures, burns and head injuries; the leading causes of trauma were traffic accidents (32.7%), assaults (23.8%), and falls (15%).

Trauma, especially assault-related, was the most common indication for admission to the hospital as a whole. Indeed, assault and other injuries made up almost half of the total admissions to the hospital, represented by S/T (23%) in addition to V/X/Y (16%). The second most common admission was due to circulatory system dysfunction (22%), followed closely by infectious and parasitic diseases (19%), a category dominated by HIV (61%) and HIV-associated diseases like TB (57%) as the major subcategories. In the medical wards, the profile for both male and female admissions was similar, with infectious and circulatory (primarily hypertension, heart failure and stroke) disorders figuring prominently, followed by respiratory diseases. In the surgical wards, however, the disease profile differed between the sexes. Whereas assault and other injury accounted for most admissions to male surgical wards, pregnancy-related problems were most prevalent in the female surgical wards. Patients admitted to surgical wards were relatively young, with a mean age of about 35 years, compared with those in the medical wards, where the mean age was 45 years.

GF Jooste is one of the busiest hospitals in Cape Town, serving more then one million people. It has more than double the number of trauma admissions than any other hospital in the Cape Town metropolitan area. Moreover, the number of patients seen in the trauma units is growing, already having grown from 55 666 in 2002/2003 to 72 719 in 2003/2004 (an increase of 30%). However, the concomitant change in the budget during this period was only from about R56 million to R65 million, a relatively slim increase of 16%. The budget allocated to GF Jooste Hospital is relatively small compared with that of other hospitals in the area, especially considering the size of the population served by the hospital. This is an issue that should be addressed by the management of hospital health resources in Cape Town.[18]

Historically, the hospital was created as an emergency hospital to reduce the workload of Groote Schuur Hospital, which also serves as a tertiary academic institution. Thus, the turnover of patients who are first seen in the emergency department and then subsequently admitted to wards constitutes the major workload of GF Jooste Hospital.

This study only analysed hospital admissions, which did not include patients seen in the emergency and outpatients (OPD) departments per se. Nevertheless, similar results would be expected if OPD patients were to be included, since most of them present there for follow-up post-hospitalisation, although some patients with more acute problems are referred directly to the OPD.

Despite obvious limitations associated with the validity of hospital records (e.g. omissions, inaccurate recording of diagnosis at the time of admission, etc.), the examination of such data has still yielded a reasonably representative picture of the prevailing ills in the community served by GF Jooste Hospital. The difficulties involved in collecting more reliable information are great, let alone the demand on time and resources required for a large-scale effort. In particular, the people responsible for coding, whether medical or non-medical staff, would require careful training, involving the use of more detailed coding books with cross-referencing. Problems intrinsic to coding would also need to be resolved. For instance, in this study it was found that patients with the same disease were often allocated two different codes (e.g. cardiac failure and cardiomyopathy), even when the pathology was the same. Coded information might be stored and analysed with relative ease using the current generation of computer technology, yet additional problems arise concerning confidentiality of information. As a safeguard, some kind of protection of the individual patient's privacy would have to be built into the system.

An analysis of hospital admissions records has two main purposes. First, it is helpful in the planning and development of hospital services. For example, it may draw attention to those areas that should be addressed urgently by highlighting a certain cause of admission that the hospital is ill-equipped to manage and/or that is occurring with increasing frequency. Conversely, it may indicate a group of patients who have been commanding an undue proportion of the hospital's resources. Second, an analysis of hospital statistics assists an

appreciation of the causes of morbidity in the area as a whole, which, in turn, can facilitate public health planning and intervention.

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