Rational planning for health care based on observed needs

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To the Editor: A major challenge facing health care services worldwide is the need to deliver services appropriate to local community needs. In South Africa, the Department of Health has adopted the District Health System[1] as the vehicle to deliver comprehensive health care to an estimated 84%[2] of South Africans who do not have private health insurance. Within each health care district, community-based and hospital-based services are to be provided. District hospitals are to play a pivotal role in supporting ambulatory primary care services as well as providing a gateway to specialist health care at regional hospitals and highly specialised care (sub-specialist level) at tertiary hospitals. Documents outlining district and regional hospital service packages[1,3] emphasise the need for appropriate packages of care, informed by feedback from service providers at the various levels of service delivery. To date, feedback based on systematic evaluation of service provision is limited.

The regionalisation of health care services in the Cape Town metropole, home to at least 2.7 million people,[4] has been initiated, and improved services for the impoverished districts of Khayelitsha, Mitchell's Plain, Nyanga and Oostenberg[5] have been identified as a matter of high priority. G F Jooste Hospital (GFJH), a 200-bed facility, currently provides both district and regional services for more than 1 million people,[6] including most of the priority districts mentioned. Additional district hospital facilities are planned for this area.[7] The appropriate level of service provision should, however, be determined by the health care needs of the communities in question. Since GFJH currently serves these communities, data from this hospital could provide essential information to inform the planning of appropriate health care services based on an objective 'needs' analysis – a desirable and cost-effective way of developing all health care services in South Africa.

This paper, based on a 10-month medical admissions survey, outlines the principal health care needs of patients currently presenting to GFJH for admission and management of acute medical problems.

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Methods

Sample size and sampling method

A prospective survey of medical patients admitted to GFJH between 1 February and 30 November 2003 was conducted.

Clinical parameters surveyed

1. Duration of hospital stay: number of days patient remained in hospital until primary outcome event occurred.

2. Bed allocation during admission: bed to which patient was admitted, i.e. general medical ward (*N* = 84), Stroke Unit (*N* = 10), or High Care Unit (*N* = 8).

3. Primary outcome of admission: event terminating patient's hospital stay, i.e. death, discharge home or transfer to another health care facility.

4. Modified Early Warning Score (MEWS) on admission: physiological scoring system using systolic blood pressure, pulse rate, temperature, respiratory rate, and level of consciousness as a global indicator of severity of illness of medical patients on admission.[8] Since a MEWS of 5 or more (out of 14) is associated with an in-patient mortality of at least 25%, admission MEWS were classified as follows: (*i*) no physiological derangement: MEWS = 0, (*ii*) mild physiological derangement: MEWS = 1 - 2, (*iii*) moderate physiological derangement: MEWS = 3 - 4, and (*iv*) severe physiological derangement: MEWS = 5 or more.

5. Human immunodeficiency virus (HIV) infection status: patients were classified as: (*i*) HIV-positive on admission or diagnosed during admission; or (*ii*) HIV suspected if signs of unexplained advanced immune compromise were present, e.g. severe wasting and oral/oesophageal candidiasis, mucocutaneous lesions of Kaposi's sarcoma, microbiologically confirmed cryptococcal meningitis, computed tomography (CT) findings, and a clinical response to therapy, compatible with a diagnosis of cerebral toxoplasmosis, and cytomegalovirus retinitis on slit-lamp examination by an ophthalmologist. Patients without clinical signs compatible with advanced HIV infection were classified as: (*iii*) HIV not suspected, or (*iv*) HIV-negative according to the results of conventional laboratory tests.

6. World Health Organization (WHO) stage of HIV infection: defined by published criteria.[9]

7. Treatment of active tuberculosis during admission: patients starting or completing a course of antituberculosis treatment during admission.

8. Specialist opinion required during admission: the admitting medical registrar critically reviewed routine post-intake ward round specialist input, which was considered necessary only if deemed essential in the management of the patient. The professional judgement of registrars, specialists-in-training with a minimum of 2 years' post-internship experience, was considered appropriate since they approximate the level of expertise generally available in most large public hospitals in SA.

9. Non-invasive specialist level investigations required during admission: investigations routinely available at regional or tertiary hospitals, e.g. CT, ultrasound, echocardiography, radionuclide studies.

10. Invasive specialist level investigations required during admission: investigations usually performed at regional or tertiary hospitals, e.g. biopsies of soft tissues, solid organs, venous or arterial contrast studies and bronchoscopy.

11. Number of medical problems during admission: number of acute medical problems requiring active intervention (i.e. treatment) during hospital stay.

Confidentiality

The survey formed part of an anonymous audit of health care service provision and patient consent was not required.

Data analysis

All data were entered onto Excel spreadsheets and analysed using Statistica 6 (Statsoft Inc., Tulsa, USA). Results are expressed as the means of monthly percentages.

Results

Total number of admissions

During the 10-month period 5 451 Emergency Unit (EU) referrals were admitted to the Department of Medicine. Only 2% of referrals were transferred directly to Groote Schuur Hospital (GSH) from the EU.

Audit sample size and quality of data capture

The survey captured data on 3 268 patients, 60.4% of all admissions during the 10-month period. More than 80% data capture was achieved for each of the parameters surveyed.

Bed allocation and duration of stay

Of admissions, 86.6% were managed in a general ward, 9% in the High Care Unit and 4.4% in the Stroke Unit. The average duration of stay in a general ward was 4 days.

Primary outcome of admission

Of all admissions, 62.6% were discharged home; a further 15.5% were transferred to a low-care facility before discharge home or transfer to a tuberculosis inpatient facility. Only 3.4% of admissions were transferred to GSH for further management. The inhospital mortality rate was 15.4%.

HIV-related burden of disease

Approximately one-third (32.3%) of surveyed patients were HIV-positive. If clinically suspected cases were included, the figure increased to 43.3%. Most patients (85.2%) had WHO stage III disease or AIDS.

Tuberculosis-related burden of disease

Undiagnosed active tuberculosis was present in 20.6% of admissions. In total, 33.4% of surveyed patients were receiving antituberculosis therapy at the time of discharge, transfer or death. The number of patients infected with both HIV and tuberculosis could not be determined from the survey data.

Severity of illness

The mean MEWS of surveyed admissions was 3. Patients were classified according to the previously defined four categories of severity of physiological derangement: none 15.4%, mild 31.6%, moderate 27.9% and severe 25.1%. These data indicate that more than half (53%) of admissions were moderately to severely ill.

Need for specialist services

More than two-thirds (69.7%) of admissions required a specialist/sub-specialist opinion. In most cases (96.7%) the opinion was obtained on site. A second indicator of specialist service use, the need for specialised investigation, revealed that more than one-third of admissions required such tests; 27.5% required non-invasive tests and a further 8.2% required invasive tests. Most investigations, 86.8% non-invasive and 85.8% invasive, were performed on site. A third indicator of the need for specialist care was the number of admissions requiring treatment for two or more acute medical problems. This applied to 59.3% of patients surveyed.

Discussion

This prospective survey of over 3 000 medical admissions confirms the urgent need for more health care facilities in a specific geographical area of Cape Town. The dramatic reduction in the average length of hospital stay, currently 4 days, as compared with 10 days reported by GSH in 1982,[10] highlights the need. Three main factors contribute to this situation: (*i*) ongoing population growth in the Western Cape, 14% from 1996 to 2001;[11] (*ii*) the growing burden of HIV infection and tuberculosis; and (*iii*) the steady decline in hospital bed numbers. GSH currently has 60 general medical beds (excluding special unit beds) as compared with 261 in 1982 and 216 in 1990.[10,12]

It is not surprising that HIV infection and tuberculosis were identified as the two leading causes of morbidity in this survey.

Indeed, they are currently two of the top 10 causes of mortality nationally.[13] This differs greatly from the 1982 survey when infectious diseases accounted for less than 10% of GSH medical admissions.[11] The implications for health care service provision of these complementary epidemics are currently the subject of much discussion.[12]

The severity of illness of general medical ward admissions in non-tertiary SA hospitals has not been previously determined. The mean MEWS reported here is considerably higher than that reported by a similar UK district general hospital survey.[8] More than half of general ward admissions in our survey were moderately or severely ill. The level of expertise required to care for such ill patients in general hospital wards has also not been previously determined. Our survey found that at least 69% of admissions required specialist or sub-specialist care; up to 28% required specialist level investigation, and 60% had two or more acute medical problems requiring intervention during admission. These three findings clearly indicate the need for specialist input at both district and regional hospitals. Regrettably the Department of Health has outlined the district hospitals package of care without adequately determining the current need for specialist services at this level.

The limited number of referrals (5.4%) to the nearest tertiary hospital, a direct consequence of on-site specialist expertise at GFJH, demonstrates the critical service and 'gate-keeping' functions provided by specialist general physicians working in non-tertiary hospitals. Removing specialist services from hospitals currently functioning in a manner akin to GFJH will almost certainly result in a massive influx of patients to Cape Town's two tertiary hospitals. Given the steady decline in general medical beds at these facilities it is clear that service needs will be increasingly unmet.

The survey findings clearly indicate the need for on-site specialist services, particularly infectious diseases expertise, in the new hospital to be built in Cape Town. These findings should, however, also serve to improve implementation of the District Health Care system in other large metropolitan areas of SA. Based on the survey findings it could be argued that up to 50% of primary care referrals requiring hospital admission may need access to specialist level services. Given this reality it may be more appropriate to triage patients requiring hospital admission at the primary care level using a MEWS, or a similarly adapted scoring system, and send moderately and severely ill patients directly to the nearest hospital with specialist services. Less ill patients could be admitted to 15-bed units attached to local community health centres (CHC). Specialists from the nearest hospital could conduct weekly ward rounds at these CHC units and review cases requiring referral for more specialised care. This model of service delivery would limit unnecessary patient traffic, obviate the need to reclassify hospitals as either district or regional level services and, most importantly, prevent the withdrawal of specialist services from communities where these services are clearly required. Specialist general physicians would continue to serve their critical service and 'gate-keeping' functions as well as provide outreach to local CHCs. This model of service delivery, already partly operational at Wesfleur CHC located 50 km from the nearest specialist service in central Cape Town, is well aligned with the principles of the District Health Care System and deserves further study in a Cape Town hospital and one or two nearby CHCs.

In conclusion, rational planning of health care, using the District Health System model cannot take place without specific knowledge of local needs. Rational planning requires careful attention to the nature of the clinical workload within relevant districts, consideration of the 'evidence-base' for effective implementation, and recognition of the critical role played by tertiary centres, i.e. training of personnel, provision of evidence-based medical practice guidelines through critical evaluation and study of advances in medicine, and guidance of new clinicians into leadership roles. If the need to retain critical masses of skilled specialist personnel is ignored, erosion of tertiary levels of care will deny the sustainability of effective district and regional care.[12]

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