A comparison of morbidity and services provided in three primary care settings

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Abstract

Objective:
To describe and compare the pattern of morbidity in a general practice casualty with primary care patients in emergency departments (EDs).

Setting and subjects:
Patients presenting to a general practice casualty and primary care patients in two EDs in Sydney, NSW.

Results:
The pattern of morbidity in the general practice casualty was similar to that among ambulatory patients in EDs.

Conclusion:
Opportunities may exist to substitute care between casualty services provided by GPs and those provided in EDs.

Rising demand for acute primary care services

Accelerating demand for services from emergency departments (EDs) is an issue for health service planners, both in Australia (Menadue et al. 2000) and overseas (NHS, 1998). One solution which has been proposed to this problem is the substitution of general practice care for care provided to less seriously ill patients presenting to EDs (Menadue et al. 2000; National Health Strategy, 1992; Dale et al. 1995). In considering such an approach it is useful to compare the patterns of casemix and service provision in general practice, in a general practice staffed casualty (GPC), and among less seriously ill patients in EDs. The GPC is a GP staffed casualty style service that meets the needs of an inner metropolitan community for acute primary care when their usual GP is not available.

Method

Data were collected in four one-week periods over two years including patient demographics, reason(s) for encounter (RFE), problem(s) treated, and management recommended in 4,758 encounters with 20 GPs in inner metropolitan practice, 5,691 encounters in a GPC, and 488 primary care encounters in two metropolitan EDs.

Primary care encounters in the EDs are defined to be those with ambulatory patients in triage categories 3, 4 and 5, the least acute categories. This definition was taken from the National Health Strategy (National Health Strategy, 1992). The allocation of patients to a triage category was undertaken as a routine by triage nurses independently of this study.

The manner of the data collection allowed the patient's medical problem(s) to be linked to their reason(s) for encounter and management. This means that managements ordered for one of two or more concurrent problems could be ascribed to the problem for which it was ordered. This has been described in more detail elsewhere (Bolton P et al. 2001). RFE data were coded using ICPC, and problems were coded using the Read Clinical Codes, version II. Both ICPC and Read II codes can be aggregated to a chapter level at which each chapter reflects a body system. Linear models were used to compare patterns of service provision between the three sites, controlling for patient age and sex, and clustering at the level of the treating GP.

Results

Polytomous regression analysis was used to compare the distribution of patient's age and sex at the three sites controlling for clustering at the doctor level using the survey method. This found an overall difference between all three sites (p <0.00005). Logistic regression analyses were then used to compare the age and sex distribution at each of the pairs of site again controlling for clustering. The results of these analyses are presented in Table 1. The critical value of _ has been set at 0.0167 to control for the three sets of comparisons made in this and subsequent similar analyses.

Table 1: Results of logistic regression of each pair of sites against age and sex

Comparison	parameter	P	Odds ratio	95% Confidence interval
GPC Versus GP	Age (years)	<0.0005	0.980	0.972-0.989
GPC Versus GP	Sex (M/F)	<0.0005	0.705	0.602-0.825
GP Versus ED	Age (years)	0.018	1.012	1.002-1.022
GP Versus ED	Sex (M/F)	0.021	1.461	1.058-2.017
GPC Versus ED	Age (years)	0.043	0.992	0.984-1.000
GPC Versus ED	Sex (M/F)	0.990	0.998	0.745-1.337

Table 2 shows the age distribution at each of the three sites. In general practice 42.7% of patients were male, in the GPC 53.0%, and in EDs 53.1%.

Table 2: Age in years at each of the three sites

Site	Minimum	First Quartile	Median	Third Quartile	Maximum
GP	0	21	46	53	95
GPC	0	19	32	48	97
ED	0	21	33	53	92

Patients in the general practice were older and more likely to be female than patients in the GPC. A similar trend was seen in the EDs in comparison to general practice. There was a trend for patients in the GPC to be younger than patients in the EDs.

There were 1.48, 1.19 and 1.32 RFEs managed per encounter in general practice, the GPC and the EDs respectively. Logistic regression found that the rates differed between all three sites (p<0.005 in all three cases).

Figure 1 below graphs the pattern of RFE for the three sites. The x-axis records the name of the ICPC chapter code, with "-" referring to RFEs for procedures for which the relevant body system was unclear to the coders. Polytomous regression analysis found an overall difference between the three sites (p<0.00005). Subsequent logistic regression analyses found that the distribution of patient RFE varied between: general practice and the GPC (p<0.00005); general practice and EDs (p<0.00005), and; the GPC and the EDs (p<0.00005).

Figure 1: Graph of the proportion of casemix seen at each site
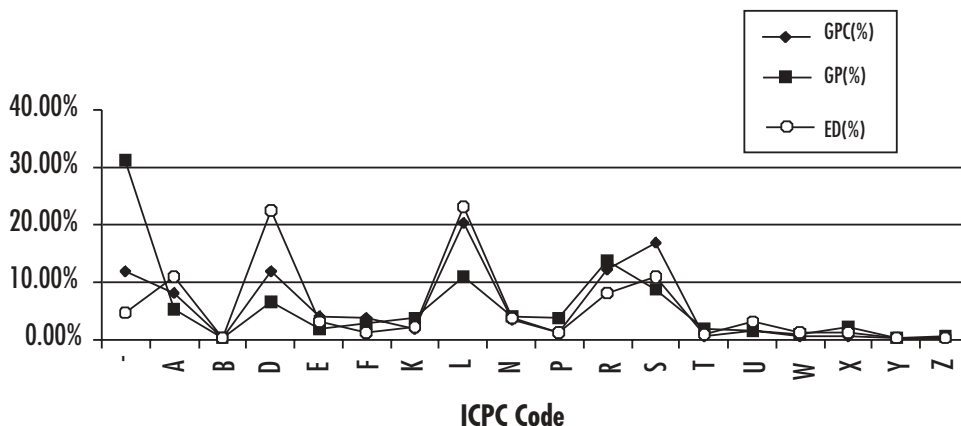
Most procedures and therapies not clearly related to a specific body system were provided in general practice (caption "-"); the EDs managed more gastrointestinal problems than did the general practitioner staffed settings (D); the ED and the GPC managed more musculoskeletal problems than did general practice (L); all settings managed a moderate proportion of respiratory illness (R) ; and, the GPC managed more skin disease (S) than did either of the other two settings. The top five individual RFEs managed in general practice were (in order): seeking a prescription, cough, a visit for a blood test, a preventive procedure, and general weakness or tiredness. In the GPC they were laceration, cough, abdominal pain, vomiting and fever. In the EDs they were: abdominal pain, laceration, vomiting, unspecified injury and fever.

There were 1.58, 1.10, and 1.11 problems managed per encounter in general practice, the GPC and the EDs respectively. Logistic regression analysis found that the rate in general practice was different to the other two sites (p<0.0005 in both cases), but no difference between the other two sites (p=0.529).

Figure 2 provides a graph of the problems managed coded using the Read Codes. Polytomous regression analysis found an overall difference between the three sites (p<0.0005). Subsequent logistic regression analyses found that the distribution of patient RFE varied between: general practice and the GPC (p<0.0005); general practice and EDs (p<0.0005), and the GPC and the EDs (p<0.0005).

Figure 2: Proportion of casemix defined by Read Code chapters at each site

A moderate proportion of patients at all three sites presented with occupational problems (chapter 1); GPs did most preventive work (6); all three sites saw moderate numbers of general problems (A); GPs saw more endocrine problems (C); all three sites saw moderate numbers of neurological problems (F); GPs saw most circulatory disease (G); the two GP staffed services saw more respiratory disease (H); and the two hospital based services saw more injuries.

While there are similarities in casemix at the body system level in many instances (eg chapter H – respiratory) there is a marked difference in the acuity of conditions seen in general practice and the other two sites. This is demonstrated by consideration of the most frequent five conditions seen at each site. In the GPC these were (in order): upper respiratory tract infection, gastroenteritis, otitis media, symptom of soft tissue (eg unspecified bruising), and viral illness. In general practice they were: hypertension, upper respiratory tract infection, depression, asthma and anxiety. In the EDs: gastroenteritis, symptom of soft tissue, ankle sprain, lacerated finger, upper respiratory tract infection. GPs tended to see chronic conditions for interval therapy while the hospital-based services saw acute illnesses.

The rate of investigations was 0.33, 0.26 and 1.18 investigations per encounter in general practice, the GPC and the EDs, respectively. The rates differed between all three sites (p<0.005 for comparisons with the ED and p=0.012 for the comparison between the GP staffed services).

The rate of diagnostic imaging was 0.06, 0.23 and 0.52 images per encounter in general practice, the GPC and the EDs respectively. The rates differed in all cases (p<0.005).

The rate of prescribing was 0.97, 0.83 and 0.82 drugs recommended per encounter in general practice, the GPC, and the EDs respectively. The GPC recommended fewer drugs per encounter than did GPs (p<0.005) as did the EDs (p=0.012), but there was no difference in the rate of prescribing in the two hospital-based settings (p=0.566).

The rate at which non-pharmacological management was recommended was 1.13, 0.89 and 1.02 times per encounter in general practice, the GPC and the EDs respectively. The difference between general practice and the GPC and EDs was significant (p=0.002 and p=0.001 respectively), but not between the two hospital-based services after adjusting for multiple comparisons (p=0.029).

The rate of referral was 0.134, 0.135 and 0.445 per encounter in general practice, the GPC and the EDs respectively. Specialist referrals were 84% of those made in general practice, and 47% of those made in both the GPC and EDs. The EDs and the GPC made 50% and 38% of their referrals to a GP, respectively. GPs made only 0.6% of referrals to other GPs. The balance of referrals at all three sites were made to allied health workers.

The rate of admission was 0.003, 0.063 and 0.166 admissions per encounter in general practice, the GPC and the EDs, respectively. This rate differed between all three sites (p<0.005 in all three cases).

Discussion

A general pattern emerges from these data in which GPs manage predominantly chronic conditions and provide preventive care, generate relatively few tests, but make greater use of both pharmacological and non-pharmacological managements, make limited referrals and almost no admissions. In contrast EDs manage acute illnesses, generate large numbers of tests, referrals and admissions, and relatively fewer managements. The GPC is intermediate between the two services. Four of the five most common RFEs are common to the GPC and ED. The casemix is more acute than general practice and similar to that of the less acute patients seen in the EDs. The pattern of investigation and referral is closer to that of general practice, and perhaps reflects the greater experience of GPs in comparison to the junior medical staff who usually see less seriously unwell patients in EDs. The pattern of management is similar to that in the ED, perhaps reflecting the lesser complexity of management of "casualty" patients in comparison to general practice patients, many of whom have complex care needs. This pattern suggests that GP management of casualty patients may be less resource intensive than it is in the EDs.

It seems probable that the differences demonstrated between general practice and EDs can be generalised to metropolitan Australia, because the samples used are typical of these service models. The GPC is a relatively uncommon model, and as such the services that it provides are sensitive to the circumstances of its establishment. Establishment and evaluation of similar services is required to establish the generalisability of these findings.

Conclusion

Consideration of the patterns of casemix and service provision in a range of primary care settings show that GPs can and do manage patients with conditions equivalent to some of the less urgent patients seen in EDs. Opportunities may exist to substitute care between casualty services provided by GPs and those provided in EDs. Further consideration needs to be given to whether the health outcomes generated by each of these provider groups and settings differ, and what health service arrangements most efficiently meet the acute primary care needs of the community.

References

Bolton P, Prior G and Usher H (2001) An instrument for the collection of problem oriented, problem linked data in primary medical care. *Australian Family Physician* 30, pp. 1190-1194.

Dale, J, Green, J, Reid, F and Glucksman, E (1995) Primary care in the accident and emergency department: I. Prospective identification of patients *BMJ* 311, pp. 423-426.

Menadue, J, Kibble, G, Leeder, SR, McMillan, M, Webster, I, McCaughan, B, Hall, J, Catchlove, B, Dalgety, H, Goss, P, Quirke, K & Reid, M (2000) *Report of the NSW Health Council - A Better Health System for NSW*, NSW Government.

National Health Strategy (1992) *A Study of Hospital Outpatient and Emergency Department Services - Background Paper No. 10 (National Health Strategy),* Canberra: Australian Modern Times Pty Ltd.

NHS (1998) *Report to the Chief Executive on Winter Pressures.* pp.1-41. Emergency Services Action team.