Factors that affect the delivery of diabetes care

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by

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Summary

Diabetes is emerging as a major threat to health, with global economic and social implications. Recent research has shown that the morbidity and mortality associated with diabetes can be reduced by timely and effective treatment. However, unless people with diabetes have access to this treatment, the impact of diabetes will continue to rise. This thesis therefore explores the current standards of care which people with diabetes receive. It also looks at factors likely to impact on delivery of diabetes care. Studies were conducted at two levels. In the studies described in Chapters 2 and 3, general data applicable to all or nearly all patients with diabetes were collected. This approach substantially eliminates selection bias but precludes the ability to examine clinical outcomes. In the other studies, detailed in Chapters 4, 5 and 6, specific aspects of diabetes care pertaining to more select groups of diabetic subjects were examined. This approach allows clinical parameters to be examined in more detail but is more subject to selection bias. It is hoped that the combination of these two approaches provides a more balanced view of the topic under examination.

In Australia, the Medicare Program, a single government controlled universal health insurance fund, provides access to medical services for all residents. Medicare occasions of service data therefore represent the most comprehensive source of information regarding health service utilisation

in Australia. The data does not account for people receiving diabetes care through public hospital based services. However, a survey of public hospitals within NSW (n=198), described in Chapter 2, showed that the number of individuals in this category is relatively small and represents only 5.2% of the diabetic population.

Using Medicare item codes, and with the permission and assistance of the Commonwealth Department of Health and Aged Care, data were extracted on attendance to medical practitioners and utilisation of diabetes related procedures for people living in New South Wales (NSW) for the individual years between 1993 to 1997. All data were stratified by the presence of diabetes, gender and age group. Individuals were deemed to have diabetes if an HbA_{1c}, which can only be ordered for a person with known diabetes, had been performed over the 5-year period and the sample size adjusted for the incidence of diabetes. Once adjusted, the number of people with diabetes in NSW for the individual years 1993 to 1997 were 143,920, 156,234, 168,216, 177,280 and 185,780. Comparison with 1996 census data confirmed a 91.7% capture of the total NSW population (5,495,900/5,995,545 individuals).

The data were retrieved for NSW as a whole and for individual postcodes. Postcodes were then classified by population density as either major urban, urban or rural. On average over the study period, persons with diabetes accounted for 3.1% of the population but they used 5.5% of general practitioner services. As seen in Chapter 2, a large proportion of

people with diabetes were also under the care of specialists and consultant physicians, up to 51.2% and 41.8% respectively, a 3 to 4 fold increase when compared with their non-diabetic counterparts. In regard to geographical location, once adjusted for age and gender, the odds ratio of attending a specialist was only slightly higher for people with diabetes living in areas of high population density when compared to people with diabetes living in rural areas. This ratio reached as high as 1.85 in regard to attendance to consultant physicians (Chapter 3). The odds ratio for the non-diabetic population was similar indicating that the difference in access to consultant physicians was not disease specific.

Analysis of results showed that despite the increase in service utilisation, large proportions of people with diabetes were not routinely monitored in regard to diabetes and its complications across the State. By 1997, HbA_{1c} was still not performed in over 40% of people with diabetes each year and only 11.6% of the diabetic population had undergone microalbuminuria estimation. Interestingly, the differences in levels of monitoring between rural and urban areas were surprisingly small. Monitoring of diabetes and its complications did improve in all parts of the State over the study period. However, the greatest improvement was seen in rural areas, despite rural patients having fewer attendances to general practitioners and fewer patients attending specialist care.

In the face of finite resources and the rising prevalence of diabetes, an increasing number of patients will need to rely on general practitioners to

provide diabetes care regardless of where they live. A 'shared care' approach which encourages and supports general practitioners to manage patients with diabetes, while giving them access to specialist services for those patients that require them, is increasingly being advocated as a way of maximising efficacy while minimising costs. Yet if health care professionals leave undone what they think is done by others, shared care can become neglected care. Chapter 4 reports a detailed audit of 200 randomly selected shared care patients who were assessed on two or more occasions. This study showed that the majority of specialist treatment recommendations are implemented by general practitioners. Doctors formally registered with the Diabetes Shared Care Programme and those who write longer referral letters were more likely to implement recommendations than their counterparts. Moreover, the average HbA_{1c} and the complication profile of these patients were similar to those found in various studies around the world. This suggests that diabetes can be well managed by a shared care approach that is adequately integrated.

To overcome the problem that data is lacking on those patients that did not return for specialist review, a further 200 shared care patients who were lost to follow up from the shared care system were traced. Information regarding whether treatment recommendations had been implemented was sought from both the referring doctor and the patient. Overall, information on 182 of the 200 patients could be obtained. As discussed in Chapter 5, comparison of the returned and non returned patients' demographic and clinical profiles at time of their initial specialist

review showed that general practitioners differentiated between the 'more complicated' patients, choosing to re-refer those with macrovascular disease, while maintaining the care of 'less complicated' patients. Re-referral for specialist review was also dependent on the patient remaining under the care of their original doctor. Encouragingly, general practitioners seemed to take a more active role in the non-returned group. They included more details regarding type and duration of diabetes in the referral letters of patients who were not re-referred for specialist review. They also implemented more treatment recommendations in the non-returned group, with the difference in implementation rate for metabolic recommendations reaching statistical significance. This study also showed that movement of patients between doctors raises concern regarding continuity of care.

The multi-factorial nature of diabetes means that best practice is not easily accommodated within a single appointment. Thus continuity of care becomes an important issue. To assess the current status, 479 consecutive patients referred to the Royal Prince Alfred Hospital Diabetes Centre in a 6-month period were recruited and underwent a detailed clinical assessment. They were also questioned regarding the number of general practitioners they attended and the length of time they had been under the care of the referring doctor. The results outlined in Chapter 6 showed that the majority of people with diabetes (87.7%) attended only one general practitioner and had been under the care of that doctor medium to long term. Younger patients, who were relatively healthy apart from the

presence of diabetes, were more likely to attend several general practitioners or have changed their general practitioner within the last year. This lack of continuity had little difference on acute outcomes such as glycaemic and blood pressure control. Appropriately, continuity of care increased with increasing age and the increasing prevalence of diabetes complications, mainly macrovascular disease.

These studies indicate that further efforts are required to improve the overall standard of diabetes care within Australia. At present there is a heavy dependency on specialist services. As the population ages and the number of people with diabetes increases, much of this burden will fall on general practitioners, as is already evident in rural areas. When provided with appropriate support and infrastructure, general practitioners are able to maintain standards of care through referral of patients with more complex medical problems and by maintaining the degree of continuity appropriate to the patient's needs. However, the collection of relevant information to monitor future trends in diabetes services provision is important. As shown in this thesis, Medicare data represents an easy and cost effective method with which to do so.

Publications arising from this research

Overland J., Mira M. and Yue D.K. (1999). Diabetes management: shared care or shared neglect. *Diabetes Research and Clinical Practice* 44(2): 123-8.

Overland J., Yue D.K. and Mira M. (2000). The pattern of diabetes care in New South Wales: a five-year analysis using Medicare occasions of service data. *Australian and New Zealand Journal of Public Health* 24(4): 389-93.

Overland J., Yue D.K. and Mira M. (submitted). The use of Medicare services related to diabetes: the impact of geographic location.

Overland J., Mira M. and Yue D.K. (2001) Differential shared care for diabetes: does it provide the optimal partition between primary and specialist care. *Diabetes Medicine* (in press).

Overland J., Yue D.K. and Mira M. (2001). Continuity of care in diabetes: to whom does it matter. *Diabetes Research and Clinical Practice* (in press).

Preface

The studies presented in this thesis are original research. Work related to the studies including study design, data collection and analysis were carried out by myself at the Diabetes Centre, Royal Prince Alfred Hospital and the Department of Medicine, The University of Sydney under the supervision of Professor Dennis Yue and Professor Michael Mira.

The retrieval of the Medicare occasions of service data was carried out by the staff of the Financing and Analysis Branch of the Commonwealth Department of Health and Aged Care.

Ethics approval for all work presented in this thesis was granted by the Central Sydney Area Health Service Ethics Review Committee.

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I am grateful to the staff of the Financing and Analysis Branch of the Commonwealth Department of Health and Aged Care for their assistance in retrieving the Medicare occasions of service data. Thanks must also go to the General Managers and Directors of Pathology of NSW public hospitals who provided details regarding diabetes services and HbA_{1c} estimations funded by the State health system.

I would also like to thank the general practitioners that reviewed their patient files and completed the questionaries for the shared care study. I am immensely grateful to the many patients who agreed to undergo the clinical assessments and provide details regarding their treatment. I hope

that this thesis will make a contribution to improving the standard of care you receive.

On a more personal level, I would like to thank my husband and daughter, Peter and Sophie, for their patience, understanding and encouragement.

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List of Abbreviations

ANOVA	one way analysis of variance
BP	blood pressure
CI	confidence interval
CSAHS	Central Sydney Area Health Service
DCCT	Diabetes Control and Complications Trial
ESRD	end stage renal disease
HbA_{1c}	glycosylated haemoglobin
HPLC	high performance liquid chromatography
HDL	high density lipoprotein
IQR	inter-quartile range
LADA	latent autoimmune diabetes in adults
LDL	low density lipoprotein
NSW	New South Wales
OR	odds ratio
P	probability
SD	standard deviation
SERU	Support and Evaluation Unit
UKPDS	United Kingdom Prospective Diabetes Study