An Audit of Type 2 Diabetes Care in a Malaysian Public Community Polyclinic

**Chew, B. H. [1*], Palikat, J. M. [2], Nur Syamimi, A. [2], Nor Azillah, A. [2],
See, J. K. [2], Hafiz, A. R. [2], Siti Nazira, A. [2], Aienum, Y. [2], Muhamad Zaid, M. [2],
Palaniappan, K. [2] and Tan, Y. Y. [2]**
[1]*Department of Family Medicine,*
[2]*Medical Students,*
Faculty of Medicine and Health Sciences, Universiti Putra Malaysia,
43400 Serdang, Selangor, Malaysia
E-mail: chewboonhow@yahoo.com

ABSTRACT

Adequate and proper diabetes care in any practice is paramount and deems to be the fundamental requirement for good diabetes control. This is an audit of type 2 diabetes care process in a public Polyclinic, with the objectives of studying the quality of diabetic care provided in terms of clinical and managerial performance and also to give recommendations on improving its diabetes care delivery. The audit was done on patients' medical records selected via systematic random sampling. Patients who have been diagnosed with type 2 diabetes mellitus for more than 2 years, and those who have come for follow-up at least twice in between 1st October 2008 and 30th September 2009 by the medical officer and/or family medicine specialist. Patients with gestational diabetes mellitus and Type 1 diabetes mellitus were excluded. A total of 100 medical records were audited. 51% were female and 82% were in the 40-69 age group. Measurements of blood glucose and blood pressure were done at each follow-up at the polyclinic at 96% and 93% of the times, respectively. Within the past one year, HbA1c was performed in 46% of the patients, while renal profile was screened in 66% of the patients and urine protein was tested in 59% of the diabetics. Only 15% had their eyes screened by fundus camera. The diabetes care process at this public polyclinic was unsatisfactory, as many annual blood tests were not done and complications screening were also omitted. Thus, an urgent intervention is recommend in order to rectify these inadequacies.

Keywords: Type 2 Diabetes mellitus, health care deliveries, medical audit, community polyclinic

INTRODUCTION

According to the Altman Committee in the United Kingdom, the term medical audit means "sharing by a group of peers of information gained from personal experience and/or medical records in order to assess the care provided to their patients to improve their learning and to contribute to the medical knowledge" (Piterman & Yasin, 1997, p. 531). Meanwhile, the concept of clinical audit, as adopted by Healthcare Commission and National Institute for Clinical Excellence (NICE) in United Kingdom (UK), is ".... a quality improvement process that seeks to improve the patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. Aspects of the structures, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual team, or service level and further monitoring is used to confirm improvement in healthcare delivery" (Clinical Governance Support Team, 2005, p. 3; Yasin & Piterman, 1997).

Type 2 diabetes mellitus (T2D) is an important public health concern for both patients and health care providers, as it could lead to varied complications, reduced quality of life and life expectancy, and yet T2D with the aforementioned impediments are preventable (International Diabetes Federation, 2004; American Diabetes Association, 2001; American Diabetes Association, 1998; Stamler *et al*., 1993; Garcia *et al*., 1974). The Third National Health and Morbidity Survey (NHMS III, 2006) reported a prevalence of 14.9%, and this marked a significant increase of the diabetes mellitus prevalence of 82% from NHMS II, which recorded only 8.2% (National Health and Morbidity Survey II, 1997). Hence, prompt and efficient treatments are needed to curb this epidemic and these have been proven to be important in order to delay complication (The UK Prospective Diabetes Study Group, 1998; Kuusisto *et al*., 1994). The four components of the standard care for T2D encompass diet, exercise, medication and education (Malaysian Clinical Practice Guidelines for the Management of Type 2 Diabetic Mellitus, 2009; American Diabetes Association, 2009). This is greatly enhanced by a regular self-monitoring of diabetes control and an early management of complications by health care providers. Thus, a good diabetes care in a practice is essential to ascertain a proper delivery of medical care for the diabetic patients, which will in turn improve the level of control and reduce complications associated with diabetes, such as diabetic retinopathy, coronary heart diseases, stroke, diabetic nephropathy, and foot complications (American Diabetes Association, 2009).

Studies revealed that the quality of diabetes management in primary care is on par or even better than hospital out-patient settings (Griffin *et al*., 1998). Nevertheless, recent systematic meta-analysis reported outcomes of diabetic care were equivocal between the sub-specialist centres and primary care centres (Piet *et al*., 2009). In particular, the quality of the diabetes care delivered by the local general practice has showed improvement over the years, while the quality of diabetes management in some other countries like Cyprus remained suboptimal (Lee *et al*., 2004; Zachariadou *et al*., 2006). However, there are a few similar studies conducted in the local public health clinics, where majority of the people obtain their diabetic care (National Health and Morbidity Survey II, 1997; National Health and Morbidity Survey III, 2006). In view of this, the researchers set out to study the diabetes care process at one of the public health clinics via a medical audit exercise focusing on the care process.

MATERIALS AND METHODS

This was a retrospective study using patients' medical records or diabetic books. The records chosen were those of the patients diagnosed with T2D for more than 2 years and have come for follow-up at least twice between 1st October 2008 and 30th September 2009 with the medical officers and/or family medicine specialist. Nonetheless, patients with Type 1 diabetes mellitus and gestational diabetes mellitus were excluded. The sample size was estimated based on the table of sample size calculations provided in the 2009 Indian Health Services Diabetes Audit Instructions, which stated that the minimum number of charts (records) needed to be reviewed to be reasonably sure (95% confidence) that a 10% difference noted from a previous or a subsequent audit is a real change and not just due to the chance for about 3000 population is 93. Thus, the sample size estimated was rounded up to 100. The records were chosen using the systematic random sampling method. From a total of 3092 diabetic records available at the health centre, 100 records were selected. Thus, the constant k is equal to 31. This means that one record was picked after every 31 medical or diabetic books. The first number selected from 1 to 31 was 6, and the process was continued by selecting the next 31st record on the list until 100 records were obtained. Each of the records was screened for the inclusion and exclusion criteria before the data were captured and recorded into a structured

pro-forma. The structured pro-forma was the standardized case record forms used by the researchers to capture data from the patients' medical records. All the indicators of the process were recorded as done or not done to evaluate the standard of diabetes care process in this polyclinic. All the targets of the performance were arbitrarily set as they were deemed reasonable by the family medicine specialists and other staff involved in providing diabetes care. Blood glucose, either fasting or casual, and blood pressure measurement at each clinic visit were set at 98% target of performance as the researchers felt that they are important for the management of T2D (see Table 2). The gathered data were analysed using SPSS version 15.

TABLE 1
Demographic and clinical characteristics of 100 patients included in the clinical audit

Characteristics	Percentage of the patients (%)
Female	51
Male	49
Age groups (years)	
< 29	1
30 – 39	10
40 – 49	26
50 – 59	29
60 – 69	27
> 70	7
Duration of diagnosis (years)	
2 to 5	47
6 to 10	35
> 10	18

TABLE 2
Percentage of the completed processes of care as compared to the target level of performance

Processes	Percentage of completed processes (%)	Target level of performance (%)
Performed at each visit		
Blood glucose (fasting or random)	96%	98%
Blood pressure	93%	98%
Performed at least once a year		
Glycated haemoglobin (HbA$_{1c}$)	46%	60%
Renal profile	66%	80%
Urine protein	59%	80%
Lipid profile	62%	60%
Electrocardiogram	35%	10%
Body mass index (BMI)	40%	30%
Foot inspection	44%	60%
Visual acuity	27%	60%
Fundus camera	15%	60%

RESULTS

Out of the 100 patients with T2D, 51 were women. The majority of the subjects (82%) were in the 40-69 age group and most (47%) have been diagnosed with T2D for 1 to 5 years (see Table 1). Blood glucose (either fasting or random) and blood pressure measurements were done at each follow-up at the clinic 96% and 93% of the times, respectively. Within the past one year, HbA_{1c} was performed in 46% of patients, while renal profile was screened in 66% of the patients and urine protein was tested in 59% of the diabetics. Only 15% had their eyes screened by fundus camera (see Table 2).

DISCUSSION

The demography of the diabetes patients at this clinic was mostly of younger age groups, i.e. from about equal gender proportion, with two thirds of them below 60 years old, and have been diagnosed for less than a decade ago.

Fasting blood glucose (FBG) and random blood glucose (RBG) were usually carried out during each follow-up visit at this clinic. Having this state level of performance was not unexpected of a government polyclinic, where there is an established medical laboratory on-site manned by a medical laboratory technician. However, HbA1c was not done even once a year for the majority (54%) of T2D patients. This was worse than the England and Wales (E&W) general practices (GP) diabetes care about 10 years ago, whereby 72.5% of the patients had an HbA1c or fructosamine at least once in the past one year (Khunti *et al*., 1999). The most likely reason for this was the unavailability of reagent for the test at this clinic, which was frequently affected by budget constraint. A similarly less desirable performance was also observed in the annual screening for nephropathy and dyslipidaemia, where there were less than two third of the patients had them done. These were comparable to (E&W) GP practices, 65.8% checked their patients' urine and 49% tested their patients' serum creatinine annually (Khunti *et al*., 1999).

Nonetheless, lipid profile test was found to be better than the expectation, whereby it achieved the target of the performance set most probably improvement in the availability of the test's reagent at the clinic's medical laboratory. The annual foot examination and body weight measurement were largely omitted even though the later and electrocardiography attained the target of performance. In more specific, foot examination practice was comparable to local GP; however, 40.5% of them improved their inspection of the diabetic feet to more than 70% of their total past visits post-intervention (Lee *et al*., 2004). The worst performance was the fundus examination amongst these diabetic patients, with only 15% had a proper fundus examination using a fundus camera. Funduscopy is a performance indicator that was found to be observed as much better amongst the local GP than this clinic, who managed to check 19.1% of their patient's fundus at least once in the past one year and this frequency increased to 51.7% after improvement exercise by intention (Lee *et al*., 2004).

RECOMMENDATIONS

In order to rectify these inadequacies of diabetes care at this clinic, the researchers have put forward the following recommendations. First, a dedicated team consisting of paramedic staff is to be trained to regularly carry out the test for blood glucose, blood pressure, weight measurement and foot examination at the pre-designated time. They could also be trained to maintain detailed diabetes registry and to post reminders for the doctor seeing the diabetes patients at the clinic about the annual blood tests HbA1c, screening for dyslipidaemia and nephropathy (Khunti *et al*., 2001; Feder *at al.,* 1995). Meanwhile, education classes for the patients are to be conducted both by the pre-trained paramedics as well as the doctors. Similarly, a regular continuous medical education (CME) for the

doctors and the staff is crucial for a better standard of diabetes care, a more proper documentation in the diabetic book and strengthen the effort of screening for complications (Feder *at al*., 1995).

Funding is not to be lacking for regular maintenance of medical equipment and the availability of reagents in the laboratory, especially for the HbA1c and lipid profiles. Staffing of the clinic must be adequate and in congruent with the workload, specifically for the doctor-patient ratio per day as it has been reported a higher volume of patients causes reduced adherence to the process measures recommended by clinical practice guidelines (Khunti *et al*., 2001; Turchin *et al*., 2007). In the present situation of staff shortages, they are to be more efficiently managed by the administration. Last but not least is to repeat a similar audit exercise on the diabetes care process after a lapse of about three to four months.

LIMITATIONS

This audit involved reading of patients' records, which entailed with it the limitations of missing laboratory results, as well as illegible and incomplete documentation. Furthermore, filing of the test results is often erroneous and this makes them very difficult to be traced. In this study, this was overcome through an extra effort of looking into the patient's medical records and the central filing system, which subsequently led to the researchers having minimal difficulty with the lost laboratory reports.

CONCLUSION

Type 2 diabetes care in this urban community polyclinic is good at blood pressure, lipid profiles and office glucose monitoring but poor at regular HbA1c testing, and worse at the regular annual screening practice for diabetic complications. As a result, urgent measures are needed to rectify and improve the current standard of diabetes care delivery in order to confer the greatest benefits to the patients.

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