

Standard of care of type 2 diabetes mellitus in Brunei Darussalam: Report of a health centre

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ABSTRACT

Introduction: The incidence of diabetes mellitus (DM) is rising in Brunei Darussalam. The prevalence of DM in 2000 was estimated to be 18,000 (5.35% of the total population) and is estimated to increase to 49,000 by 2030. More cases are detected and managed in the Primary Health Centres. Pengiran Anak Puteri Muta-Wakillah Health Centre (PAPMWHC) has a big population catchment area (population about 70,000), and a big outpatient attendance (51,143 in 2010). The aim of the study was to evaluate the care of patients with type 2 DM (T2DM) at the PAPMWHC. **Materials and Methods:** We retrospectively reviewed 325 patients T2DM patients registered and followed up at the Health Centre during the study period (December 2010 to November 2011). The case notes were retrieved and random sampling was done. Data were collected by five doctors working at the health centre, using a proforma designed for the purpose of the study. The standard of care as stated in the *Clinical Practice Guidelines, Diabetes Mellitus, November 2007* were assessed. Performance was considered satisfactory when it achieved 80% of cases. **Results:** Of the 325 patients, 61% were seen less than three times a year, and 39% were seen four or more times a year. Weight and blood pressure were checked every three months in 16.9% and 20.9% respectively. Hb_{A1C} was checked in 85.9% patients twice a year and 88.3% had retinopathy screening done at least once a year. Full lipid profile was done in 53.9% at least once a year, annual serum creatinine in 66%, annual urine microalbumin or albumin creatinine ratio in 59.9%, and foot examination in 70.2%. Documentation of advice on diet control was done in 31% patients, 13% on exercise, and 66.6% on smoking cessation at every visit. **Conclusion:** We achieved the standards only in two parameters. We have identified the reasons for the failure to achieve the standards and have put forward suggestions to rectify them.

Keywords: Cardiovascular risk factors, diet, lifestyle programme, obesity

INTRODUCTION

The incidence of diabetes mellitus (DM) is on the rise in Brunei Darussalam. ¹ The average

life expectancy of Bruneians has progressively increased and currently stands at 77.1 years for males and 78.3 years for females. ² Along with the ageing population, sedentary lifestyles and diets rich in fats and calories (westernised diets) have resulted in increasing incidence of the non-communicable dis-

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seases (NCDs) such as obesity, DM, heart disease and cancers which are now the main disease burden in many countries. [4-8]

Data from Integrated Health Screening for civil-servants showed that 38.6% were overweight and 25.7% were obese. Overall, 14.5% had high fasting blood sugars of above 5.6 mmol/L. ¹ The prevalence of DM has increased from 5.35% in 2003 to 12.5% in 2010. ^{2, 3} Type 2 DM (T2DM) accounts for the majority of cases of patients with DM. By the end of 2010, the total number of patients on dialysis was 524 with more than 50% of these patients having DM as the aetiology of kidney failure. ¹ DM is currently the third leading cause of mortality in the country, after cancer and heart disease. ²

The primary health care system in Brunei Darussalam, as with other countries in the world, manages most of the patients with uncomplicated DM. More cases are being detected in the primary health centres through routine medical check-up or when patients seek medical attention for other complaints. Early detection and proper management of DM are important in preventing and/or slowing down disease progression. Complications

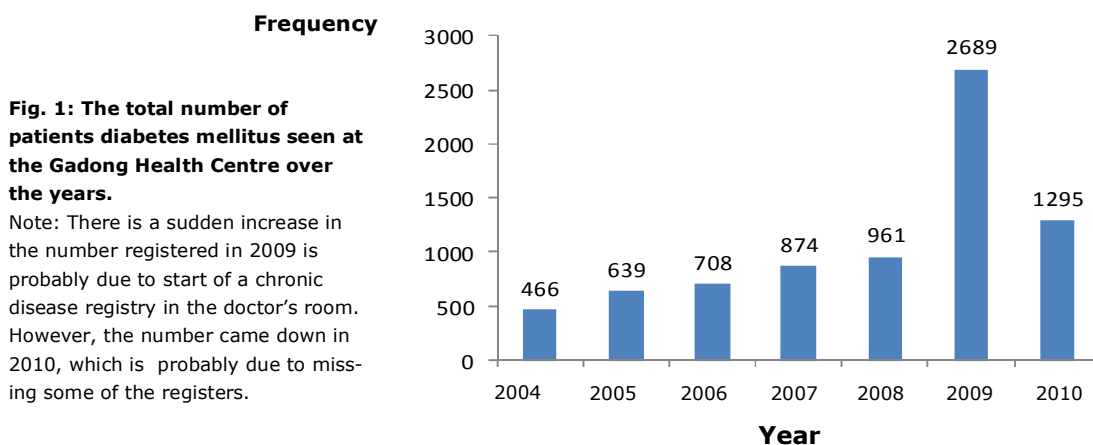
of DM are a huge burden on the health care system.

The Gadong Health Centre (Pengiran Anak Puteri Muta-Wakillah Health Centre [PAPMWHC]) has one of the highest patient attendance in the Brunei-Muara district, the most populous of the four districts. The attendance at the PAPMWHC in 2010 was 55,143. ¹ The total number of patients with T2DM registered in the Chronic Disease registry of this health centre as of 2010 is shown below (Figure 1).

This study was conducted to assess the quality of care of patients with diabetic patients in the PAPMWHC. In this study we assessed physicians compliance with the quality indicators for DM management as stated in the *Clinical Practice Guidelines for Diabetes Mellitus Negara Brunei Darussalam November 2007*. ⁴

MATERIALS AND METHODS

We retrospective reviewed 325 patients T2DM patients registered and followed up at the PAPMWHC during the study period (December 2010 to November 2011). The standard of care as stated in the *Clinical Practice*



Guidelines, Diabetes Mellitus, November 2007 were assessed.

Setting: The PPMWHC is one the largest government health centre located in the capital (Brunei-Muara district), Bandar Seri Begawan. It is located in the same compound as the Rimba Dialysis Centre, the largest dialysis centre in the country. In 2013, the Gadong Health Centre moved to the new building in the adjacent vicinity and was renamed as the PPMWHC. This health centre has a population catchment of approximately 30,000.

Data Collection: Patients with T2DM followed up in the health centre were identified from the Chronic Disease registry under the T2DM section. The case notes were retrieved from the Medical Office Record of the health centre and random sampling was done. The randomly selected cases were reviewed and inclusion and exclusion criteria was applied. Only patients with T2DM solely followed-up in the health centre and registered with the chronic diseases with adequate duration of follow up were included. Patients were

excluded from the study if they were diagnosed with T2DM during the study period, transferred from other health centres or institutions including hospital for further follow up, patients with shared care with specialist clinics in any hospitals or who had defaulted the appointments during the study period. Data were collected by five doctors working at the health centre, using a proforma designed for the purpose of the study.

Parameters: Performance parameters assessed included weight and blood pressure documentation at least every three months, Hb_{A1C} checked at least twice a year, annual urine micro albumin or albumin : creatinine ratio (ACR), full lipid profile, serum creatinine, and foot examination, referred to the eye clinic for retinopathy screening, and educated at every visit on diet, exercise and smoking (where applicable). The performance parameters were considered satisfactory if they were carried out at least 80% of the time.

RESULTS

Altogether, 322 patients were included in the

Frequency

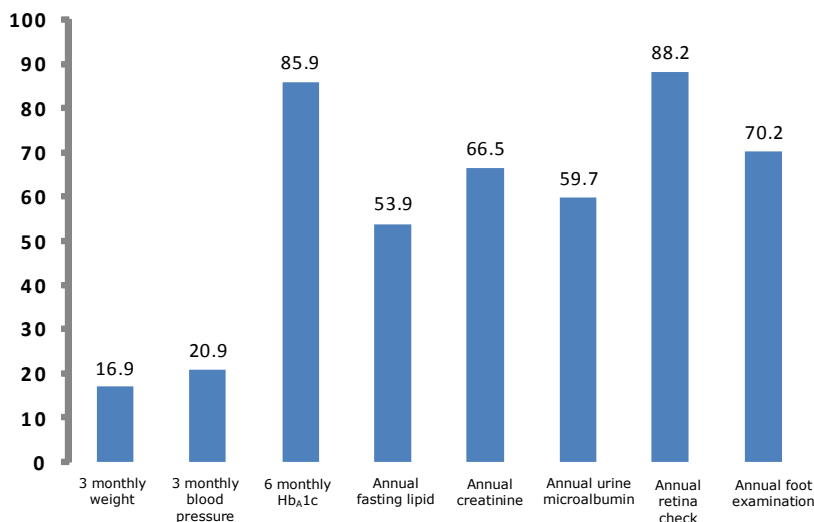


Fig. 2: Parameters Performances assessed

study. Of these, 138 (42%) patients were males and 187 (58%) females. The ethnic breakdown of patient is similar to the national breakdown with predominant Malays.

Among the assessed parameters, only two were >80% (six monthly Hb_{A1c} check and annual retina check). However, apart from three monthly blood pressure (20.9%) and weight monitoring (16.9%), the other parameters were over 50% (Figure 2).

Overall, only 31% (n=102) were advised or education provided on every visit on their diet and 13% (n=45) on exercise. There was only six patient documented as active smoker and 66.6% (n=4) on smoking cessation (Figure 3).

The majority of the patients were seen ≤3 times (61%) and 39% patients were seen ≥4 times a year.

DISCUSSION

Our review of the performance indicators in the management of patients with T2DM in a busy health care centre was suboptimal. Only two of the eight parameters assessed achieved satisfactory level (over 80%). These two parameters were six monthly Hb_{A1c} and annual retinal check. Although most of the parameters were carried out over 50% of the time, achieving satisfactory standard of care for all of these parameters should have been easily achieved and a must in order to provide the best care to the patients.

Several reasons may account for the suboptimal performances seen in our study. Many of the clinics in the health centre are run by a group of doctors and individual doc-

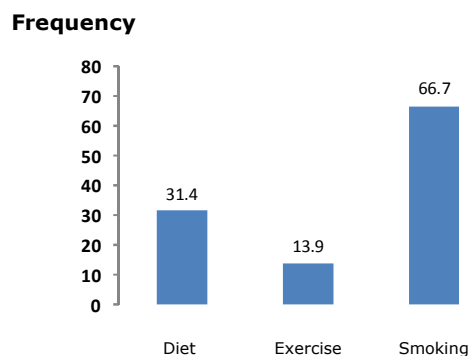


Fig. 3: Advice or education provided to patients at each visit.

tors may not necessarily see the same patients. Furthermore, movement or transfers of doctors between the various government clinics are not uncommon, and this may also affect patient care. More importantly, prior to this study, check lists were not used and doctors may not necessarily be aware of what have been done the previous visits. In a busy clinics, consultation and time spent per patients are short and hence, investigations or checks may be overlooked especially in patients who were well and were previously documented to be well controlled. Missed appointments which is seen in other clinics is also a factor.

Apart from monitoring patients' condition through check ups and investigations, patients are also advised or educated on health matters whenever possible. In our study, dietary discussion was only documented in 31% whereas only 13.9% for exercise or physical activities. Among those documented to be smoking, two third was advised or counseled regarding smoking cessations. The poor performance of these parameters could probably be attributed to time constrain per consultations in a busy clinic. However, despite this, time should always be allocated to discussion

or checking on patients lifestyle every visit.

In this health centre, the majority of patients were seen ≤ 3 times (61%) and 39% patients were seen ≥ 4 times a year. As in any busy health centre or institutions, patients with good glycaemic and blood pressure control and those without any complications (retinopathy, nephropathy and neuropathy) are usually seen less frequently than those with poor control or have complications. In our centre, patients with good control are typically seen at least once in six to seven months, whereas those with suboptimal or poor control were seen more frequently at two to four months interval. In centres where nurse practitioners service such as diabetes nurse educators (DNE) are available, patients can be seen more frequently between the physicians and DNE. To date, there are no DNE available in any of the health centres outside of the main government hospitals.

Based on the findings of this study, there are several measures or steps that could be taken to improve the standard of care. The most important is perhaps the improvement and standardisation of the care provision and operating procedures. Introduction of checklist for each patient will be very useful and should be easy for doctors to identify which patients who are behind in their assessments. With the introduction of the Brunei Darussalam Health Information and Management System (BruHIMS), an integrated one patient one computer record, implementing this should be easy. Furthermore, computerised records will also make the results or previous consultations and investigations easily available. However, clinicians should be thorough and document all

investigations done. Also with the recall system available with the computerised record, missed appointments can be reduced. Introduction of nurse practitioners or educators can also improve the performance.

There main limitation of this study is the retrospective nature. Like any retrospective study, it is inherently associated with missing or incomplete data. However, despite this, this study can for the basis for improvement and future comparisons. Given that the government clinics share many similarities from the running to the patient demographic, our findings will probably be similar to other clinics.

In conclusion, our study showed that the standard of care for T2DM is suboptimal. However, through this study, several steps have been taken to improve and ensure that all necessary parameters are carried out as recommended.

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