Contents lists available at ScienceDirect

Primary Care Diabetes

journal homepage: http://www.elsevier.com/locate/pcd

Original research

# Diabetes care and complications in primary care in the Tshwane district of South Africa

*Elizabeth M. Webb*[a,*], *Paul Rheeder*[a], *Danie G. Van Zyl*[b]

[a] *School of Health Systems and Public Health, University of Pretoria, South Africa*
[b] *Department of Internal Medicine, Kalafong Hospital, University of Pretoria, South Africa*

ARTICLE INFO

*Article history:*
Received 10 October 2013
Received in revised form 3 May 2014
Accepted 6 May 2014
Available online 3 June 2014

*Keywords:*
Diabetes
Metabolic control
Complications screening
Primary care

ABSTRACT

*Aims:* To describe the diabetic population receiving primary care from the Tshwane district public health services and to assess the quality of care of members of this population, their level of disease control and the extent of their complications.

*Methods:* A cluster-randomised trial was conducted in 12 primary care clinics in Tshwane district. A total of 599 diabetic patients attending these clinics for review were consecutively interviewed and clinically examined. Data on the care received was also obtained from their clinical records for the previous 12 months. Patients randomised to the active arm of the study were screened for complications.

*Results:* The mean age was 58 years and 80.5% had a body mass index (BMI) ≥25 kg/m$^2$. Sixty-eight percent of patients were female. Acceptable glycaemic control and LDL-cholesterol were found for only 27% and 33% of patients, respectively (HbA1c < 7%; LDL < 2.5 mmol/l). Despite more than 79% of patients reporting to be hypertensive, 68% of patients had a systolic blood pressure above 130 mmHg and 64% had a diastolic blood pressure above 80 mmHg. Evaluating patient records of the preceding year, screening for eye complications was only reported in 8.2%, feet complications in 6.5%, kidney complications in 21.4% and cardiovascular complications in 7.8%. The screening prevalences found were 29% for retinopathy, 22% for maculopathy, 5% for neuropathy (neurothesiometer), 7% for nephropathy (eGFR stages 3–5), 17% for possible infarction (Rose questionnaire) and 36% for severe erectile dysfunction (SHIM questionnaire).

*Conclusion:* Diabetes care and screening for complications at primary care level in the Tshwane district were found to be sub-optimal. Measures should be taken to address this.



## 1. Introduction

The global prevalence of diabetes and other non-communicable diseases is increasing rapidly, as a result of changes in lifestyle, urbanisation and population ageing. Sub-Saharan Africa is not excluded from this rapid rise in prevalence, which is predicted to double within the next 20 years [1,2]. In addition to these factors, the sub-Saharan region suffers from high mortality from infectious diseases

* *Corresponding author*. Tel.: +27 82 420 3027; fax: +27 123542071.
E-mail addresses: elize.webb@up.ac.za, elize.webb@gmail.com (E.M. Webb).

http://dx.doi.org/10.1016/j.pcd.2014.05.002
1751-9918/

such as HIV infection, tuberculosis and malaria. It is, however, predicted that by 2020 the mortality from non-communicable diseases will overtake that of infections as the major source of mortality. The burden of non-communicable diseases in sub-Saharan countries is already proportionally greater than that found in developed countries. In sub-Saharan Africa diabetes care and costs have to compete with anti-retroviral drugs, tuberculosis treatment and malaria control programmes [3,4]. Also, as far back as 1980 a Tanzanian research project carried out by Mhando and Yudkin stated that "there is no indication that the African diabetic is less vulnerable to complications of the disease, a fact which has become apparent with better follow-up" [5]. Various studies conducted in South Africa, Nigeria, Ghana, Cameroon and Tanzania and others, as well as review articles on diabetes in Africa, confirm both the increase in prevalence and the changing epidemiology of diabetes complications [3,4,6–8].

The Burden of Disease study group [9] estimated in 2000 that 5.5% of South Africans aged ≥30 years had diabetes, and that 4.3% of all deaths in South Africa were due to diabetes. Furthermore, 14% of ischaemic heart disease, 10% of stroke, 12% of hypertensive disease and 12% of renal disease were attributable to diabetes.

Chronic conditions in developing countries are usually managed at the primary health care level. Policy guidelines for the management and treatment of diabetes at primary care level are in place in South Africa [10]. These guidelines include recommendations for annual (or more frequently if indicated) blood tests for both glycaemic and lipid control, as well as screening for complications linked to the feet, eyes, kidneys and heart. The implementation of guidelines by health professionals confronts many barriers, as reported by Daniels et al. [11] and Rotchford and Rotchford [12]. These include time constraints, conflict with local practices, health system problems and patient beliefs about their disease.

In South Africa, limited data is available on the quality of diabetes care. For example, Levitt et al. [13] in 1997 found that in three primary care facilities in Cape Town, a need existed for improved diabetes care at primary level. No data were available to assess the quality of diabetes management at primary care level in the Tshwane district, a large metropolitan area in the Gauteng Province. Primary care services are provided by both provincial and local government. In 1994 President Nelson Mandela announced that all health care for pregnant women and children under the age of 6 years would be free for users of public health facilities. This was extended to all services rendered at public primary health care facilities from 1 April 2006 [14].

We conducted a clinical audit and cross-sectional baseline assessment of patients who attended primary health care clinics in the Tshwane district. These patients participated in a cluster-randomised controlled trial for investigating the efficacy of a comprehensive care intervention for diabetes management at primary care level.

The primary objective of the audit and assessment was to report on glycaemic-, lipid- and hypertension control, as well as the prevalence of diabetes-related complications: retinopathy, neuropathy, nephropathy and cardiovascular complications. The secondary objective was to evaluate the adherence to screening guidelines for metabolic control and complications as set out by the South African diabetes guidelines [10,15].

## 2. Setting

Gauteng Province is a landlocked province, one of nine provinces of South Africa. It is the economic hub of South Africa as it contributes 33.7% to the national GDP. It is highly urbanised (97%). The Tshwane district, one of five districts of the Gauteng province of SA has a population of 2,708,702, with 27.3% living in traditional and informal dwellings, shacks or squatter settlements. A total of 22.5% of households in the district have access to electricity for lighting. Facilities in the district providing health care are 90 health facilities, broken down into 68 clinics, 8 community health centres, 3 satellite clinics, 5 district hospitals, 1 regional hospital, 1 tertiary hospital and 4 specialist hospitals. The estimated primary health care expenditure per capita in Tshwane district for 2010/11 was R520 (US$52 at the time) [16,17].

Prevalence data for diabetes in Tshwane district are not available. The management of diabetes at primary health care level is nurse led, with doctors doing sessional work (usually 4–8 h per week) at the clinics. Community health centres have full-time doctors. The Essential Drug List of South Africa provides algorithms for health personnel to provide care in a stepwise way for diabetes and hypertension. Diabetic patients are seen by a health professional at least four times a year, although some patients attend primary care clinics monthly, to have their random glucose, blood pressure and weight checked and to collect their monthly supply of medication, whereas others have their medication delivered by a community health worker. The system is clearly fragmented and clinic-dependant.

## 3. Patients and methods

### 3.1. *Study design*

We randomly selected six intervention clinics and six control primary health care clinics in the Tshwane district for a cluster randomised clinical trial. These were selected from three strata: those managed by the local authority; those managed by the provincial authority; and community health centres managed by the provincial authority. The intervention clinics were evaluated using a mobile screening service and the control clinics received standard care.

### 3.2. *Participants*

Diabetic patients attending the abovementioned primary health care clinics in the Tshwane district were invited to the mobile unit to participate in the study. Patients were eligible for inclusion to the study if: (1) they had type 2 diabetes (unspecified duration) or type 1 diabetes for five or more years; (2) they were older than 18 years of age; and (3) they were able to give informed consent.

Each patient was interviewed, examined clinically, and a 12-month retrospective clinical record review conducted with