Journal of Endocrinology, Metabolism and Diabetes of South Africa 2019; 24(2):58–64
https://doi.org/10.1080/16089677.2019.1608053

JEMDSA
ISSN 1608-9677 EISSN 2220-1009

ARTICLE

Incidence of hypoglycaemia in the South African population with diabetes: results from the IDMPS Wave 7 study

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Objectives: Management of diabetes is a balancing act of preventing a state of hyperglycaemia while avoiding episodes of hypoglycaemia. Limited information is currently available on the incidence of hypoglycaemia in South African people diagnosed with diabetes. Data regarding the management of diabetes and incidence of hypoglycaemia in the South African population was collected as part of Wave 7 of the International Diabetes Management Practices Study (IDMPS).
Design and methods: During this observational study the first 10 adult individuals with type 2 diabetes and the first five adult individuals with type 1 diabetes presenting to a study site during the two-week study period were enrolled.
Setting: Patients were enrolled from the private healthcare sector in South Africa only.
Subjects: A total of 445 individuals (49 diagnosed with T1D, 396 diagnosed with T2D) were included.
Outcome measures: Glycated haemoglobin and hypoglycaemia data were recorded for each patient.
Results: Of the patients who reported experiencing hypoglycaemia, 48.6% (17/35) among T1D individuals and 67.8% (40/71) among T2D individuals experienced hypoglycaemia over a four-week period. Furthermore, in patients who discontinued insulin treatment ($n = 11$), fear of hypoglycaemia was reported to influence adherence to insulin treatment by 27.3% in T1D and T2D individuals. Of the 148 patients not achieving their HbA1c target, 23.0% reported fear of hypoglycaemia as a reason.
Conclusions: This report demonstrates the need to address hypoglycaemia and fear of hypoglycaemia in the South African diabetes population.

Keywords: HbA1c, hypoglycaemia, hypoglycaemia unawareness, type 1 diabetes, type 2 diabetes

Introduction

Diabetes is characterised by hyperglycaemia due to deficient insulin secretion, as in Type 1 diabetes (T1D), insufficient insulin secretion and/or insulin resistance, as in Type 2 diabetes (T2D).[1] Exogenous insulin is regarded as the treatment for patients with T1D.[1,2] While a range of oral anti-hyperglycaemic treatments is available for the treatment of T2D, the progressive nature of the disease may ultimately require the use of exogenous insulin to reach and maintain glycaemic goals.[1,3,4] Exogenous insulin[5] and certain oral anti-hyperglycaemic agents, such as sulfonylureas,[6] are associated with an increased risk of hypoglycaemia. Long-term management of diabetes is thus a balancing act between achieving glycaemic targets and concurrently avoiding episodes of hypoglycaemia.

Clinically relevant hypoglycaemia is defined as blood glucose levels < 3.0 mmol/l, while blood glucose levels < 3.9 mmol/l should be regarded as a cautionary signal.[1,7] Such low levels of blood glucose have been associated with cardiac arrhythmias in patients diagnosed with T2D,[8,9] increased risk for myocardial infarction,[10] elevated levels of inflammatory markers,[10] coma,[11] neuronal damage[12] and increased microvascular events.[13] Several studies have also reported increased mortality rates associated with severe hypoglycaemia, including the ADVANCE[13], ACCORD[14] and NICE-Sugar studies.[15]

As there is currently not a national diabetes registry in South Africa, limited data are available on the burden of hypoglycaemia in patients diagnosed with diabetes in South Africa. The International Diabetes Management Practices Study (IDMPS) was an international registry of patients diagnosed with diabetes conducted in 24 countries. This report is based on the data recorded for hypoglycaemia for patients diagnosed with T1D and T2D participating in the South African cohort in 2016 (Wave 7).

The International Diabetes Management Practices Study (IDMPS) is an international, multicentre, observational registry. The primary objective of the study was to evaluate the management of patients with T2D in current medical practice. The secondary objectives of the study were to assess the management of patients diagnosed with T1D in current medical practice, and to investigate the predictive factors for reaching target HbA1c in patients with diabetes.

Methods and materials

Site selection

A total of 38 study sites participated in the study in South Africa. Participating physicians were requested to include the first 10 adult T2D patients and the first five adult T1D patients presenting to their practice during the two-week study period. This recruitment strategy was aimed at enrolling a random patient sample in the survey, and therefore does not reflect the management of diabetes at a particular site. To ensure that the participating physicians were representative of physicians managing

diabetes in South Africa, a stratified sample was randomly selected. The stratification was based on the speciality of the physician (endocrinologist, specialist physician, diabetologists or general practitioners). The majority of patients included in the study accessed health care in the private healthcare setting.

Patient selection

Adult patients diagnosed with type 1 or type 2 diabetes mellitus, who consulted the participating physicians during the two-week recruitment period, were invited to participate and provide informed consent. Exclusion criteria included concomitant participation in a clinical trial and/or current temporary insulin therapy (gestational diabetes, pancreatic cancer, surgery).

Information was collected using questionnaires completed by physician and patient.

Sample size determination

The sample size was determined per country, based on the primary objective and the expected precision. In addition, it was assumed that insulin is the least prescribed therapy in terms of proportions and thus the sample size was determined to establish the frequency of insulin treatment.

The sample size was estimated to give an estimation of proportions with an absolute precision of 20% and a confidence interval of 95%. The following calculations were used:

$$n = p(1-p) \times (1.96/e)^2$$

Where: n = the per country sample size; p = the estimated proportion of T2D patients treated with insulin (based on local feedback, for RSA insulinisation was estimated to be 20%); e = the absolute precision (20%) × p = the relative precision.

Given this information, a computation table was developed, taking into account the proportion of insulin treatment. For example, if in a given country, 10% of patients receive insulin (p) with an absolute precision of 20%, the sample size (number of T2D patients to be recruited) would be 864 patients in this country for each cross-sectional survey. Based on these calculations, 447 patients formed the pre-specified sample for South Africa.

Statistical methods

Analyses performed on the database were mainly descriptive. Qualitative data were summarised using number of non-missing data, number of missing data, counts and percentages (two-sided confidence interval (CI) 95% of proportion if pertinent), and quantitative data were summarised using qualitative descriptive statistics (number of non-missing data, number of missing data, mean, standard deviations, median, first and third quartiles, minimum and maximum). Statistical analyses were conducted with SAS Software version 9.2 (SAS Institute, Cary, NC, USA). AdClin Software version 3.1.4 (AdClin, Paris, France, www.adclin.com) was used to format tables and listings.

Ethics

The survey was conducted according to the principles established in the 18th World Medical Assembly (Helsinki, 1964) and all subsequent amendments, and in accordance with the guidelines for Good Clinical Practice. Ethical approval for the study was obtained from Pharma-Ethics. Written informed consent was obtained from all the participating patients prior to inclusion in the study.

Results

Baseline characteristics

A total of 445 patients (49 diagnosed with T1D 396 diagnosed with T2D) were included in the South African cohort of the IDMPS Wave 7 study. These patients were enrolled by a total of 38 doctors, which included nine specialists (endocrinologists or diabetologists) and 29 non-specialists (general practitioners). Baseline characteristics for the South African cohort are displayed in Table 1.

Patients were obese (average BMI > 31 kg/m^2), had longstanding diabetes (average disease duration 12.13 years) and were poorly controlled with an average HbA1c of 8.0% recorded for the entire study population (see Table 1). Approximately 83.8% of patients had private health insurance and an estimated 53.5% of patients reported being employed. Patients reported taking up to 7.3 days of sick leave in the three months prior to participation in the study.

Therapeutic regimens used

In this study, a total of 49 (100%) patients diagnosed with T1D and 180 (45.4%) patients diagnosed with T2D reported receiving insulin treatment. The majority of T1D patients (83.7%) reported the use of basal and prandial insulin, while 10.2% were treated with premix insulin. Of the 180 T2D patients on treatment with insulin, 100 (55.5%) indicated treatment with basal

Table 1: Baseline characteristics of South African patients included in the IDMPS Wave 7 study

Factor	T1D (n = 49)	T2D (n = 396)	Total (n = 445)
Age (mean ± SD)	42.6 ± 14.7	58.4 ± 11.2	56.7 ± 12.6
Gender (% male)	40.8	54.0	52.6
BMI (kg/m^2 ± SD)	25.1 ± 4.8	31.9 ± 6.5	31.2 ± 6.7
BMI > 30 kg/m^2, n (%)	1 (2)	79 (19.9)	80 (18.0)
HbA1c (% ± SD)	8.6 ± 1.8	7.9 ± 1.8	8.0 ± 1.8
Duration of diabetes (years)	19.0 ± 13.7	11.3 ± 8.1	12.1 ± 9.2
Ethnicity: Caucasian/Black/Other (%)	71.4/6.1/22.5	32.8/24.5/42.7	37.1/22.5/40.5
Patients with private health insurance, n (%)	44 (89.8)	329 (83.1)	373 (83.8)
Patients with tertiary education, n (%)	32 (65.3)	162 (40.9)	194 (43.6)
Employed (full time or part time, %)	75.5	50.8	53.5
Sick leave taken in the preceding 3 months (days, mean ± SD)	3.0 ± 3.0	8.5 ± 14.1	7.3 ± 12.7

insulin, 53 (29.4%) reported use of a prandial insulin and 74 (41.1%) reported treatment with premix insulin.

The basal insulins used included long-acting insulin analogues (79.0% of patients), intermediate human insulin (15.9% of patients) or biosimilar insulin (5.1% of patients). Prandial insulins used included short-acting insulin analogues (78.5% of patients), rapid-acting human insulins (19.4% of patients) and biosimilar insulin (2.2% of patients).

Treatment with oral agents was reported in 90.5% of the patients enrolled in the study. A total of 9 (18.3%) T1D patients reported the use of OGLD, which consisted of biguanides (8 patients) and the combination of biguanides and sulfonylureas (1 patient). Of the T2D patients on treatment with oral anti-hyperglycaemic agents, a total of 344 (93.5%) patients were on treatment with biguanides, 139 (37.8%) patients reported the use of sulfonylureas and 21 (5.7%) patients received other OGLD treatment.

Self-adjustment of insulin doses were reported by 85.7% of T1D patients and 51.1% of T2D patients currently on treatment with insulin.

All T1D patients and 97.2% of T2D patients reported self-monitoring of blood glucose levels. Data indicated similar rates of self-monitoring of blood glucose levels in patients diagnosed with T2D for patients on treatment with oral glucose lowering drugs (96%), insulin (95.2%) and a combination of oral glucose lowering drugs and insulin (98.7%). Patients were asked to classify their habitual self-monitoring of blood glucose levels in different categories: daily monitoring (reported by 54.6% of patients), occasional monitoring (reported by 32.5% of patients), seldom monitoring (reported by 8.9% of patients), only very occasionally (reported by 3.8% of patients) and unknown (reported by 0.3% of patients) (Supplementary Table 1).

Results indicate that 18.9% of patients reported monitoring of blood glucose levels at all meals, 54.5% of patients reported testing at some meals, 27% of patients reported monitoring at bedtime and for 9% of patients the time of monitoring was not recorded. Mean number of tests per day was reported as 1.7 (see Supplementary Table 1). Data correlating frequency or timing of monitoring with episodes of hypoglycaemia was not recorded.

Of 229 patients on insulin, 148 (66.7%) failed to reach the HbA1c target set by their treating physician. Of this group, 43.9% indicated that insufficient titration of insulin is the reason for failure. Fear of hypoglycaemia was reported as the main obstacle to reaching HbA1c target by approximately 23% of patients. This was most evident in patients diagnosed with T1D (Table 2).

Furthermore, 4.8% ($n = 11$) of the 229 insulin-treated patients in this study had previously discontinued insulin treatment. Fear of hypoglycaemia was one of the main reasons for non-adherence reported by this group (27.3%) (Table 3). Of the 148 patients not achieving their HbA1c target, 23.0% reported fear of hypoglycaemia as a reason.

One T1D patient and 73 T2D patients reported treatment with beta blockers. Of the T2D patients on treatment with beta blockers, 36 were also on treatment with insulin.

Hypoglycaemia

During the IDMPS study, data were collected on the incidence of symptomatic hypoglycaemia and severe hypoglycaemia, defined as an episode requiring assistance from a third party as per ADA recommendations.[16] Confirmation of blood glucose levels was not required to validate reported events.

Of the T1D patients included in this study, only 38 (77.6%) patients reportedly experienced symptomatic episodes of hypoglycaemia in the preceding 3 months (Table 4). A total of 35 of these patients provided information on the frequency of hypoglycaemia and 17 (48.6%) patients reportedly experienced at least one episode of hypoglycaemia per month.

A total of 71 T2D patients on treatment with OGLD or the combination of OGLD and insulin reported experiencing symptomatic episodes of hypoglycaemia in the preceding 3 months. Of these, 59 provided information on the frequency of hypoglycaemia episodes and 40 (67.8%) of these patients reportedly experienced an episode of hypoglycaemia on a monthly basis (Table 4).

Severe hypoglycaemia in the 12 months prior to the study was reported by 22.4% and 5.4% of patients diagnosed with T1D and T2D, respectively. Severe hypoglycaemia was reported by patients on treatment with OGLD only, the combination of OGLD and insulin or insulin only.

The number of emergency room visits due to hypoglycaemia reported in this study 'for a 12 month period' was low, with a mean of 0.3 for T1D patients and 0.01 for T2D patients. The number of patients seeking medical attention at an emergency room and the frequency thereof were not recorded.

The majority of T2D patients who experienced hypoglycaemia, either symptomatic or severe, were on treatment with insulin, either alone or in combination with oral anti-hyperglycaemic

Table 2: Patient-reported reasons for not reaching HbA1c target while on insulin treatment

Factor	T1D ($n = 34$)	T2D ($n = 114$)	Total* ($n = 148$)
Lack of titration of insulin	38.2%	45.6%	43.9%
Fear of hypoglycaemia	29.4%	21.1%	23.0%
Lack of experience in self-management of insulin dose	17.6%	32.5%	29.1%
Lack of diabetes education	23.5%	28.1%	27.0%
Day-to-day blood glucose level instability	52.9%	20.2%	27.7%

*Based on the cohort who did not reach glycaemic target set by the treating physician as indicated by HbA1c.

Table 3: Patient-reported factors for previous non-adherence to insulin treatment

Factor	Total* ($n = 11$)
Fear of hypoglycaemia	3 (27.3%)
Lack of efficacy	2 (18.2%)
Occurrence of side effects	2 (18.2%)
Impact on social life	2 (18.2%)
Lack of support	2 (18.2%)

*Of the total cohort, 11 patients reported discontinuing insulin treatment. This number includes T1D and T2D patients.

Table 4: Reported hypoglycaemia episodes in the South African IMDPS Wave 7 cohort

Factor	T1D (*n* = 49)	T2D			Total (*n* = 445)
		Other treatment* (*n* = 3)	OGLD treatment only (*n* = 213)	Insulin treatment** (*n* = 180)	
Patients with symptomatic hypoglycaemia in the last 3 months, *n* (%)	38 (77.6)	0 (0)	15 (7.1)	56 (31)	109 (24.6)
Patients with severe hypoglycaemia*** in the last 12 months, *n* (%)	11 (22.4)	0 (0)	3 (1.4)	18 (0.1)	32 (7.3)
Frequency of hypoglycaemia episodes, *n* (%)					
Unknown	3	6	6		15

	T1D (*n* = 35)	T2D		Total (*n* = 94)
		OGLD treatment (*n* = 9)	Insulin treatment** (*n* = 50)	
At least once per month, *n* (%)	17 (48.6)	7 (77.8)	33 (66.0)	57 (60.6)
At least once per week, *n* (%)	18 (51.4)	2 (22.2)	17 (34.0)	37 (39.4)

*Includes treatment with diet and exercise only and 'other', non-pharmacological treatment.
**Includes patients on treatment with combination of OGLD and insulin (*n* = 159), as well as patients on treatment with insulin only (*n* = 21).
***Requiring assistance.
OGLD: oral glucose lowering drugs.

agents (Table 4). Some 46.4% of patients diagnosed with T2D were treated with sulfonylureas, whether in combination with other oral anti-hyperglycaemic agents or as monotherapy. Approximately 26.1% of patients diagnosed with T2D reported treatment with a combination of sulfonylureas and insulin.

A number of factors contributing to severe hypoglycaemia were proposed by participants. These included inappropriate management of insulin (59.4% of T1D and T2D patients), emotional distress (40.6% of T1D and T2D patients) and inappropriate dosage of insulin (37.5% of T1D and T2D patients) (Supplementary Table 2). Two patients from the South African cohort listed lack of self-testing of blood glucose levels as a factor contributing to severe hypoglycaemia.

Discussion

Hypo- and hyperglycaemia have been associated with adverse health outcomes.[17] The aim of treatment in patients diagnosed with diabetes is the correction of hyperglycaemia, while avoiding episodes of hypoglycaemia. Data collected for the South African cohort of the International Diabetes Management Practices Study, with a particular focus on hypoglycaemia, is presented in this report.

The incidence of hypoglycaemia over a four-week period was reported as 48.6% (17/35) in T1D individuals and 67.8% (40/71) in T2D individuals. Furthermore, in patients who discontinued insulin treatment, fear of hypoglycaemia was reported to influence adherence to insulin treatment by 27.3% in T1D and T2D individuals. Of the 148 patients not achieving their HbA1c target, 23.0% reported fear of hypoglycaemia as a reason.

Accurate reporting of episodes of hypoglycaemia can prove challenging due to hypoglycaemia unawareness. Indeed, a study utilising continuous glucose monitoring reported that patients diagnosed with T2D are aware of only 39% of diurnal and 11% of nocturnal episodes of hypoglycaemia.[9] In the current study blood glucose levels were not reported, and it is therefore possible that the incidence of hypoglycaemia may have been underreported as asymptomatic episodes may not have been reported. In contrast, a patient's perceived symptomatic hypoglycaemia does not automatically equate to clinically relevant low serum glucose levels. As confirmation of blood glucose levels was not required to validate patient reports, over-reporting of hypoglycaemia may have occurred, which limits accurate reflection of true incidence.

It should be considered that various additional factors may influence reporting of hypoglycaemia episodes. The presence of significant diabetes-related complications, including diabetic nephropathy or autonomic neuropathy, could contribute to the increased incidence of hypoglycaemia. Furthermore, the use of other therapeutic agents, including beta blockers for the management of hypertension, especially in the T2D population, could mask adrenergic response to hypoglycaemia, which in turn could contribute to under-reporting of hypoglycaemia. Several patients enrolled in the study were on treatment with beta blockers in addition to antihyperglycemic agents. Unfortunately data were not collected to indicate the incidence of hypoglycaemia in these patients.

Data collected for the South African cohort of the IDMPS Wave 7 study indicates that hypoglycaemia, and fear of hypoglycaemia, may still be an obstacle to reaching glycaemic targets (Tables 2 and 3). These data reflect perceived patient barriers to achieving glycaemic targets and confirm the results of a large multinational online survey, the Global Attitude of Patients and Physicians 2 (GAPP-2) study.[18] The GAPP-2 study reported that fear of hypoglycaemia was one of the most common factors in patients' intentional basal insulin dosing irregularities.[18] However, it has also been demonstrated that fear of hypoglycaemia is a consideration for physicians when prescribing insulin treatment. A total 75.5% of physicians participating in the GAPP-1 study reported that insulin treatment would be prescribed more aggressively if the fear of hypoglycaemia could be eliminated.[19] Similar results describing the fear of hypoglycaemia as a barrier for patient and physicians alike were reported by Ross *et al*. in an extensive literature review.[20]

Fear of hypoglycaemia may also affect the patient's willingness to adhere to prescribed treatment, compromising achievement of glycaemic targets. In a recent retrospective study using electronic medical records for patients diagnosed with T2D, Dalal

and colleagues investigated patients' persistence on insulin treatment after one or more episode of hypoglycaemia.[21] The study demonstrated that 68% of patients who had experienced hypoglycaemia discontinued insulin treatment in the first 12 months. The incidence of hypoglycaemia was reported as 10.5% in the first six months after initiation of basal insulin treatment.[21]

It is important that healthcare professionals identify and acknowledge the fear of hypoglycaemia. The requisite facility, through routine outpatient consultation, should be provided to discuss the fear and develop strategies to assist patients in overcoming this barrier. A helpful tool designed for this purpose is the Hypoglycaemia Fear Survey, which, if implemented in appropriate cases, may prove invaluable in educating patients and modifying entrenched patient and physician behaviours.[22]

Data indicated that 22.4% of patients diagnosed with type 1 diabetes and 5.4% of patients diagnosed with T2D experienced at least one episode of severe hypoglycaemia in the year preceding the study (Table 4). A higher incidence of severe hypoglycaemia was reported in patients diagnosed with T2D on treatment with insulin (14.3%) or the combination of insulin and oral anti-hyperglycaemic agents (9.6%) than for patients on treatment with oral anti-hyperglycaemic agents alone (1.4%) (see Table 4). These rates are similar to those reported by Dalal and colleagues.[21] Another non-interventional study, the Hypoglycaemia Assessment Tool (HAT), reported that 14.4% of participants diagnosed with T1D and 8.9% of participants diagnosed with T2D reported an episode of severe hypoglycaemia.[23] Only patients on treatment with insulin were included in the HAT study; no mention was made of the use of oral anti-hyperglycaemic agents.[23]

When compared with the results of the HAT study, patients diagnosed with T1D in the South African cohort of the IDMPS Wave 7 study seem to experience episodes of hypoglycaemia more frequently. The incidence of severe hypoglycaemia in the T2D population treated with insulin was reported as > 10% in both studies. It should be considered that the IDMPS Wave 7 study recorded episodes of severe hypoglycaemia over a 12-month period, while the HAT study recorded episodes of severe hypoglycaemia over four weeks only. It is not surprising that patients diagnosed with T1D may be at higher risk for severe hypoglycaemia than their T2D counterparts.

The cost of hypoglycaemia, and in particular severe hypoglycaemia, extends beyond pure economic cost, as hypoglycaemia affects productivity and quality of life, and remains an obstacle to reach glycaemic targets. The cost of one event of severe hypoglycaemia is estimated to range from US$ 1 746 to US$ 3 525.[24] Even though differences in healthcare systems do not allow for direct translation of this cost, it is alarming to note that hypoglycaemia-related hospitalisation costs increase substantially when the number of hypoglycaemia events exceeds six per year.[25] Results from the current study (see Table 4) and the HAT study[23] reported hospitalisation due to hypoglycaemia in both the South African and international cohorts. It must be considered that therapeutic regimens are often not included in these health economic reports.

It is well known that some anti-hyperglycaemic treatments, especially sulfonylureas[5] and insulin,[6] are associated with increased risk of hypoglycaemia. In addition, co-morbidities including renal dysfunction increase the risk of hypoglycaemia.[26] Considering that insulin is the cornerstone of treatment for patients diagnosed with T1D,[1] the increased incidence of hypoglycaemia in this population is not completely surprising. Inappropriate management of insulin, inappropriate dosing of insulin and inappropriate timing of insulin were mentioned among the major factors contributing to severe hypoglycaemia in the present study (see Table 4). To address these factors contributing to severe hypoglycaemia a number of tactics should be considered, including selecting treatments with low risk of hypoglycaemia, a multidisciplinary approach to patient education to ensure appropriate patient-level management of insulin therapy and caution in insulin-treated patients with renal failure or in patients with blunting of awareness of hypoglycaemia.

In order to reduce treatment-related hypoglycaemia, a number of novel treatments have been developed with lower risk for hypoglycaemia, such as glucagon-like peptide receptor-1 agonists (GLP-1RAs) and sodium-glucose co-transporter-2 inhibitors. Clinical study programmes for the GLP-1RAs liraglutide and lixisenatide have demonstrated minimal risk for hypoglycaemia in heterogeneous populations of patients with diabetes.[27–29] Furthermore clinical studies on longer acting basal insulins, including insulin degludec and insulin glargine U300, have demonstrated a reduced risk of hypoglycaemia in extensive phase three clinical trials in comparison with other available insulin analogues.[30–32] Some of these treatments are costly and the benefit to the patient should be weighed against this potential increased treatment cost.

A recent study of insulin-naive patients diagnosed with T2D has demonstrated that patients who experienced hypoglycaemia during the first three months of initiation of basal insulin therapy were at higher risk of experiencing recurring hypoglycaemia.[33] As hypoglycaemia may adversely affect the achievement of glycaemic goals, it is vital to ensure that patients diagnosed with diabetes and treated with insulin receive appropriate education on the treatment as well as the management of hypoglycaemia.

Recently, reports have alluded to an association between hypoglycaemia and adverse cardiovascular events.[34] However, the potential correlation of severe hypoglycaemic events and macrovascular complications, including acute coronary syndromes, is clearly impossible to gauge given the limited access to all clinical data. Thus, it is difficult to extrapolate data collected during this study to the long-term consequences of recurrent or frequent hypoglycaemic events in this observational study.

Treatment-induced hypoglycaemia may be limited by improving patient education and thereby enhancing patient-level management of anti-diabetic treatment. From data collected in the current study, there is a need for in-depth patient education on insulin management as 29% of patients indicated that lack of diabetes education adversely affected glycaemic control (see Table 2). It has been suggested that patient empowerment, through education on diabetes and the prescribed anti-hyperglycaemic agents, contributes to overall successful management of diabetes and the role of the nurse is undisputed.[35] The pivotal role of diabetes nurse educators as part of a multidisciplinary team to enhance patient education has been reported in the multinational Diabetes Attitudes Wishes and Needs (DAWN) study involving various healthcare patients, the level of education provided and the rapport between nurses and their patients.[36]

A number of caveats must be considered when interpreting data from the current study. As participants were recruited from the private healthcare sector only and the racial distribution of the participants is not reflective of the South African population, generalisability of the data to the whole South African population is limited. Furthermore, due to the study design and lack of follow-up, the data do not necessarily represent the management practices of the participating sites. The use of DPP-4 inhibitors, GLP1 receptor agonists and sodium glucose co-transporter-2 inhibitors was restricted in this study due to limited availability and reimbursement. Due to the small cohort of T1D patients included in the study, and therefore the limited information collected on hypoglycaemia in the context of T1D, additional studies in this population may be warranted.

Conclusion

Management of diabetes is often a balancing act between preventing a state of hyperglycaemia, while avoiding episodes of hypoglycaemia. However, often episodes of hypoglycaemia are not reported to healthcare practitioners. Data reported here from Wave 7 of the International Diabetes Management Practices Study (IDMPS) indicates that hypoglycaemia is still prevalent in South African patients diagnosed with diabetes. With symptomatic or severe hypoglycaemia experienced by 77.6% of patients diagnosed with T1D, and 18% of patients diagnosed with T2D over the period of three months, this report confirms the need for addressing episodes of hypoglycaemia in the South African population.

Disclosure statement – No potential conflict of interest was reported by the authors.

Supplemental data – Supplemental data for this article can be accessed at https://doi.org/10.1080/16089677.2019.1608053.

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Received: 27-11-2018 Accepted: 12-04-2019