

PATTERN AND OUTCOME OF ADMISSIONS OF PATIENTS WITH DIABETES MELLITUS INTO RASHEED SHEKONI TEACHING HOSPITAL DUTSE, JIGAWA STATE

Abdullahi Usain Ahmad¹, Habib Abdullahi Abba⁴, Ibrahim Musa Saulawa², Dalhatu Abdullahi Aminu³, Amin Zaitun Hassan³, Abdullahi Umar Faruk³, Abdu Alhaji¹, Uloko Andrew Enemako³, Muazu Salisu Babura¹, Ibrahim Usman Muhammad², Muhammad Arabi Saad⁵, Mohammed Baba Geidam⁶, Gezawa Ibrahim Danjummai³,.

¹Department of internal Medicine, Faculty of Clinical Sciences, Federal University Dutse.

²Department of Community Medicine, Faculty of Clinical Sciences, Federal University Dutse.

³Department of Internal Medicine, Aminu Kano Teaching Hospital.

⁴Department of Obstetrics and Gynaecology, Federal University Dutse.

⁵Departments of Medicine, State Specialist Hospital & Modibbo Adama University Teaching Hospital, Yola, Adamawa State, Nigeria

⁶Departments of Medicine, Yobe State University Teaching Hospital, Damaturu, Yobe State, Nigeria

Corresponding Author: *Abdullahi Usain Ahmad, Email: usaini122@gmail.com*

Received: 09-Mar-2026

Accepted: 21-Apr-2026

Published: 30-Apr-2026

Abstract

Background: Diabetes mellitus affected 537 million people worldwide in 2021, with projection indicating an increase to 643 million by 2030, and 783 million by 2045. It is estimated that over 6.7 million people aged 20–79 have died from diabetes-related causes in 2021. Despite this, data on this subject matter, remain limited in our center. **Objectives:** we determined the pattern and outcome of admissions of patients with diabetes into the medical wards of Rasheed Shekoni Teaching Hospital, Dutse, Nigeria, over a two-year period. **Methods:** a descriptive cross-sectional retrospective review of secondary data obtained from the patients' records in the records department of the hospital. The study population included all patients with diabetes mellitus who were admitted into the medical wards of this hospital within the period under review. Information on demographic, reason for admission, baseline clinical, and biochemical indices were cleaned and analysed. **Results:** one hundred and sixty-seven patients (5.9%) with diabetes mellitus were admitted over the period under review. The mean age of the patients was 51.82±17.67. Type 2 DM contributed 80.2% of the DM admission. Fifty-eight Patients (34.7%) presented with diabetic emergencies; among which Hyperosmolar Hyperglycemic State, Diabetic Ketoacidosis and hypoglycemia contributed 18.6%, 11.4% and 4.8% respectively. The overall outcome was good, with 94% discharged and 5.4% mortality. Hypertension was the predominant comorbidity identified among the patients (22.2%). **Conclusion/Recommendation** Hyperosmolar hyperglycemic state was the most common cause of mortality among admitted DM patients in Dutse. Infection is most common reason for admission of patients with DM. There is need for adequate health education to the people as well as provision of adequate health facilities for management of diabetes and diabetes related complications.

Key words: outcome, Prevalence, Type1DM, Type2DM, Dutse.

Cite this article: Abdullahi UA, Habib AA, Ibrahim MS, Dalhatu AA, Amin ZH, Abdullahi UF, Abdu A, Muazu SB, Ibrahim UM, Saad MA, Geidam MB, Gezawa ID. Pattern and outcome of admissions of patients with diabetes mellitus into Rasheed Shekoni Teaching Hospital Dutse, Jigawa State. Yob Med J.2026;2(1):9-16

Introduction

Diabetes mellitus affected 537 million people worldwide in 2021, and this number is projected to reach 643 million by 2030, and 783 million by 2045. In addition, 541 million people are estimated to have impaired glucose tolerance in 2021. It is also estimated that over 6.7 million people aged 20–79 have died from diabetes-related causes in 2021. More than 122.5 million are not aware of their condition¹.

Diabetes mellitus is a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defect in insulin secretion, insulin action, or both. The effect of diabetes includes long term damage, dysfunction and failure of various organs.²

The world health organization recently classified diabetes mellitus into six main groups namely type 1 diabetes, type 2 diabetes, Hybrid forms of diabetes, unclassified diabetes, other specific types of diabetes and hyperglycemia first detected in pregnancy.³ Type 2 diabetes (previously referred to as Adult –onset or non-insulin dependent diabetes) is the most prevalent form of diabetes. It is a heterogeneous disorder most commonly associated with insulin resistance in the presence of impairment in compensatory insulin secretion.⁴

In Nigeria, the most populous country in Africa, the prevalence of T2DM is still increasing, with the country widely reported as having Africa's highest burden of diabetes.⁵ The prevalence of diabetes in Nigeria, based on the 1997 national expert committee report on non-communicable disease (NCD) was 2.2% with male: female ratio of 1.1:1.⁶ A recent systematic review and meta-analysis in 2018 by Uloko A.E et.al⁷ showed the national pooled prevalence of diabetes to be 5.77%. The pooled prevalence of diabetes in the six geopolitical zones of Nigeria was 3.0% North-West, 5.9%, North -

East, 3.8% North-Central zone, 5.5% in the South-West, 4.6% in South-East, and 9.8% in the South-South zone.⁷ In 2011, the International Diabetes Federation (IDF) estimated the prevalence of DM among Nigerian adults at 4.04%.⁸ In 2021 IDF estimated approximately 537 million adults (20-79 years) were living with diabetes; by 2045 this would rise to 783 million.¹

The American Diabetes Association (ADA) in 2010 came up with additional criteria based on HbA1c; HbA1c \geq 6.5% according to the ADA confirmed a diagnosis of type 2 diabetes mellitus. Values of HbA1c $<$ 6.5% does not exclude the diagnosis of diabetes from other glucose tests. The WHO in 2011 adopted these criteria as proposed by ADA.⁸ The present study may serve as baseline for the pattern/spectrum of patients with diabetes mellitus admitted into RSFUTH Dutse. The findings would guide stakeholders in tackling the disease as well as preventing associated complications.

Methods

Ethics – ethical clearance with approval number RSFUTH/GEN/226/V.II dated 25th June, 2024, was obtained from the research ethics committee of RSFUTH Dutse, before commencement of the study. All the provisions of HELSINKI declaration were respected throughout this study.

Study design and population

A descriptive retrospective review of secondary data obtained from the patients' records in the records department of the hospital. The study population included patient with diabetes mellitus who were admitted into the medical wards of the Rasheed Shekoni Federal University Teaching Hospital, Dutse and have met the inclusion criteria for the study.

Study period: The review of secondary data obtainable from the records of patients admitted into the medical wards of RSFUTH, who met the inclusion criteria; from December 2022 to November 2024.

Study area

The study was conducted in Dutse, Nigeria. The site of the study was Rasheed Shekoni Federal University Teaching Hospital (RSFUTH). The hospital is a secondary facility that was established in 2009 by the Jigawa state government which was handed over to the federal government in 2022 for teaching and training.

The Hospital serves the people of Jigawa state and as a referral Centre for some local government from neighboring States like Bauchi and Kano States. The Hospital has four major clinical departments supported by well-equipped laboratories (Chemical pathology, Haematology, Microbiology and histopathology).

Sample size determination and sampling technique: The minimum sample size was determined using convenient sampling of all those who met the inclusion criteria.

Inclusion/Exclusion Criteria

The criteria for inclusion in the study was Known patients with diabetes or newly diagnosed with diabetes aged 18 years and above on admission in the medical wards of RSFUTH within the period under review.

Data collection- A pro forma was developed to extract information from the folders of the patients admitted in the medical wards of RSFUTH, Dutse. Diagnosis based on history, physical examination, and investigations done, as well as outcome of admissions were collated, documented, and analyzed.

Data analysis - The data generated were collated, checked, and analyzed using a computer based statistical programme for social sciences (SPSS) version 20.0 [SPSS

Inc]. Descriptive statistics such as frequencies and percentages were presented in the form of tables to summarize categorical variables. Chi square test was utilized to compare proportions. A confidence interval of 95% was used, and a p-value of ≤ 0.05 was considered significant.

Results – the total number of admissions into the medical wards over the period under review (December 2022 to November 2024) was 2826. Out of this, there were one hundred and sixty seven (5.9%) diagnosed with diabetes mellitus. The mean age of the patients was 51.82+17.67. More than half of the patients were females contributing 51.5%. Type 2 DM contributed 80.2% of the DM admission as shown in table 1. Sixty six (39.1%) of the patients were either diagnosed with DM <5 years or were newly diagnosed. Fifty eight patients (34.7%) presented with diabetic emergencies; among which Hyperosmolar Hyperglycemic State, Diabetic Ketoacidosis and hypoglycemia contributed 18.6%, 11.4% and 4.8% respectively. The prevalence of diabetes mellitus among the admitted patients into the medical wards was 5.9%. Sepsis was the most common precipitant among all the patients, taking 35.3% of the admission as shown in table 2. The overall outcome was good with 94% discharged and 5.4% mortality as shown in table 3. Majority of the patients had no background comorbidities (74.5%). Hypertension was the predominant comorbidity identified among the patients (22.2%). Mortality is higher among those with short hospital stay, contributed 5 out of the 9 mortalities with p- value of 0.037 and strong correlation with coefficient of 4.87 and p –value of 0.027 as shown in table 4.

Table 1: socio- demographic characteristics of the participants

Age Group (Years)	Frequency (N)	Percentage (%)
18 – 44	48	28.7
45 – 64	80	47.9
65 and above	39	23.4
Gender Distribution		
Female	86	51.5
Male	81	48.5
Total	167	100
DM class		
Type 1 DM	33	19.8
Type 2 DM	154	80.2

Table 2 clinical characteristics of the participants

Hospital stay (days)	Frequency (N)	Percentage (%)	
1 – 4	37	22.2	
5 – 10	88	52.7	
>10	42	25.1	
Duration of DM (years)			
<5	66	39.6	
5 – 10	48	28.7	
>10	53	31.7	
Total	167	100	
Diabetic emergency			
	Frequency (N)	Percent age (%)	% among diabetic emergencies
DKA	19	11.4	32.8
HHS	31	18.6	53.4
Hypoglycaemia	8	4.8	13.8
Subtotal	58	34.7	100.0
Others	109	65.3	
Total		100.0	
Precipitants/diagnosis			
Precipitants/ diagnosis	Frequency	Percentage (%)	
Sepsis (DMFS+UTI)	59	35.3	
		3.6	
CAP	6	1.2	
Heart failure	2	1.8	
ACS	3	5.4	
Stroke	9	3.6	
CKD	6	50.9	
Subtotal	85	49.1	
Others	82	100.0	
Total	167		

Others = DCLD, acute gastroenteritis, newly diagnosed DM with no identifiable precipitants.

Table 3: outcome of the admission and presence of comorbidities

Outcome	Frequency (N)	Percentage (%)
Discharge	157	94.0
Mortality	9	5.4
Referral	1	0.6
Total	167	100.0
Comorbidities		
Absent	124	74.3
HTN/HHDx	37	22.2
Dyspepsia	1	0.6
CKD	1	0.6
IHD	2	1.2
BPH	1	0.6
DCM	1	0.6
Total	167	100.0

Keys: HTN/HHDx =hypertension/hypertensive Heart Disease; CKD = chronic kidney disease; IHD = Ischaemic Heart Disease; BPH = Benign prostatic Hyperplasia; DCM = Dilated cardiomyopathy.

Table 4: Outcome characteristics

Parameter	Outcome			P-value
	Discharge	Mortality	Referral	
T1DM	31	2	0	0.87
T2DM	126	7	1	
Gender				0.49
Female	81	4	1	
Male	76	5	0	
Age				0.49
Young	46	2	0	
Middle age	76	3	1	
Elderly	35	4	0	
Duration of DM				0.44
< 5 years	63	3	0	
5 – 10 years	43	4	1	
>10 years	51	2	0	
Duration of hospitalization				0.037
1 – 4 days	31	5	1	
5 – 10 days	86	2	0	
>10 days	40	2	0	
Diabetic Emergencies				0.17
DKA	18	1		
HHS	25	6		
Hypoglycaemia	8	0		
Absent comorbidities	117	6	1	1.000
HTN/HHDx	34	3	0	
Dyspepsia	1	0	0	
CKD	1	0	0	
IHD	2	0	0	
BPH	1	0	0	
DCM	1	0	0	

Keys: HTN/HHDx =hypertension/hypertensive Heart Disease; CKD = chronic kidney disease; IHD = Ischaemic Heart Disease; BPH = Benign prostatic Hyperplasia; DCM = Dilated cardiomyopathy; T1DM=type1 Diabetes mellitus; T2DM = type2 Diabetes mellitus.

Discussion

In this study the prevalence of DM among patients admitted into the wards was 5.9%. Similar findings was reported by Omar et al⁹ from Al-Ain UAE, and Chijioke et al¹⁰ 5.1% from Ilorin south western Nigeria respectively. Lower prevalence of 1%, 2.6% and 4.4% were reported from among admitted patients to hospitals in Abu Dhabi, Saudi Arabia and south western Nigeria respectively.^{11, 12, 13} Higher prevalence of 9.6% was reported by Umoh et al¹⁴ from Calabar South Eastern Nigeria, 10.3% and 10.4% by Ogbera et al¹⁵ and Unachukwu et al¹⁶ from Lagos and Port Harcourt

respectively. Kefale et al¹⁷ also reported high prevalence of 48.3% from Ethiopia.¹⁷ The wide range of reported prevalence from within Nigeria could be due to environmental factors, socio-economic status as well as lifestyle changes..

Among the patients with DM 51.5% were females. Higher percentage of females was reported by Omar et al⁹ from Al-Ain UAE of 61.8%. However, Unadike et al¹⁸ reported that more males were admitted than females in a ratio of 1.1:1. The reason may be that males are more economically empowered than females and hence will seek treatment earlier than their female counterparts.^{6,18}

In our study T2DM patients contributed 80.2% of the patients admitted with DM into the medical wards. Similar prevalence of T2DM of 90.2% was reported by Alsayed et al¹⁹ from Egypt. However, both findings were higher than what was reported by Omar et al⁹ of 71.7% from UAE. The finding in our study is consistent with global epidemiology of DM with T2DM contributing 85 to 95% overall.

In the current study the mortality rate was 5.9% among patients with diabetes admitted into the medical wards. Lower rate of mortality of 3.2% was reported by Beshyah et al¹¹ from Al-Ain, and no deaths were directly attributed to the metabolic derangements. A larger data set was quoted to show similar findings to the Al-Ain study. Lower mortality rate of 3.4% was also reported by Ajayi et al¹³ from south western Nigeria. The difference reflects the economic status and prevalence of diabetes. Higher mortality rate of 11.2% was reported by Kefale et al¹⁷ from Ethiopia and 23.7% by Okafor et al²⁰ South Eastern Nigeria and Lagos 22.6%.¹⁵ possible reason for the differences in our findings may include variation in access to healthcare services, early diagnosis and treatment, presence of comorbidities and difference in study population. The overall treatment outcome of the DM patients was good. This is comparable to report from previous studies of 76.4% and 74.6% from Ethiopia and south western Nigeria respectively.^{13,17}

Infection was the most common reason for admission in our study accounting for 35.3%. The finding was similar to previous report from Sudan and Ethiopia of 36% and 36.3% respectively.^{17,21} in contrast cardiovascular disease was predominant reason for admission in UAE.¹¹

In our study DKA was reported in 11.4% of the DM patients on admission. Higher prevalence of 47% was reported from Sudan by Bchir et al²² and 38.2% by Kefale et al¹⁷ from Ethiopia. HHS was the predominant hyperglycemic emergency reported in our study. This is contrary to report by Bchir and

Kefale, where DKA predominates. This may be attributed to a lack of knowledge about the acute symptoms of diabetes among the patients with diabetes on admissions in our Centre and the preference for native medicine among our people thus they present late in emergency situations.¹⁴

In this study hypoglycaemia was reported in 8 (4.8%) of DM related admissions. Most of the patients admitted with hypoglycaemia were elderly. Our finding is similar to that of Kefale et al¹⁷. In both studies patients with hypoglycaemia were elderly, 65 years and above. Patients in the older age-groups are especially vulnerable to hypoglycemia. Age-related declines in renal function and hepatic enzyme activity may interfere with the metabolism of sulfonylureas and insulin, thereby potentiating their hypoglycemic effects. The vulnerability of the elderly to severe hypoglycemia may be partially related to a progressive age-related decrease in β -adrenergic receptor function.^{17, 23} Thirty percent of the patients presented with diabetic emergency (DKA/HHS). This indicates lack of good metabolic control, leading to admission with emergency, hence the need for more education /awareness on the disease by the people. Lack of access and high cost of insulin, delays in seeking medical attention, misdiagnosis and poor diabetic care are all contributory factors to this attendant mortality.¹⁸

Hypertension was the predominant comorbidity identified among the patients admitted with diabetes mellitus. In our study, 37 (22.2%) of the patients has Hypertension. Higher prevalence of Hypertension was reported by Ajayi et al¹³ in 49.2% of the patients. Hypertension is a major cardiovascular risk factor, and the prevalence of hypertension in diabetic patients is considerably higher than in the general population.¹³

Conclusion

Hyperosmolar hyperglycemic state was the most common cause of mortality among admitted DM patients in Dutse. Infection is most common reason for admission of

patients with DM. Recommendation – adequate health education to the people as well as provision of equipped health facilities for management of diabetes and diabetes related complications.

References:

1. Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, et al. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diab Res Clin Pract.* 2023; 204:110945.
2. Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications. Report of a WHO consultation, 1999. WHO/NCD/NCS/99.2
3. World Health Organisation. Classification of diabetes mellitus. World Health Organisation; 2019.
4. Mark A, David C.A, Martina L,B. et al; Pancreatic hormones and diabetes mellitus: Greenspan Basic Clin Endo 9th ed 2011;590- 671.
5. Mbanya JC, Motala AA, Sobngwi E, F K Assah, Enoru ST. Diabetes in sub-saharan Africa. *Lancet* 2010; 375:2254-66.
6. Akinkugbe O.O: The national expert committee on Non-communicable diseases in Nigeria, Final report on Non-communicable diseases survey 1997: Series 4:64-90.
7. Uloko AE, Musa BM, Ramalan MA, Gezawa ID, Puepet FH, Uloko AT, et al. Prevalence and risk factors for diabetes mellitus in Nigeria: A systematic review and meta-analysis. *Diabetes Ther.* 2018 Jun; 9 (3):1307 – 1316.
8. Use of glycated haemoglobin (HbA1c) in the diagnosis of diabetes mellitus, Abbreviated report of a WHO consultation. WHO/NMH/CHP/CPM/11.1.
9. Omar, A. Diabetes mellitus in Al-Ain: the impact on hospital services. *Emirates Med. J* 1985; 3:119 -122.
10. Chijioke A, Adamu AN, Makusidi AM. Mortality pattern among type 2 diabetes patients in Ilorin, Nigeria. *JEMDSA* 2010; 15 (2): 78-82.
11. Beshyah SA, Khalil AB, Benbarka MM, Mustafa HE. Hospitalization Patterns of Diabetic Patients to a Tertiary Hospital in Abu Dhabi, United Arab Emirates. *Ibnosina J Med BS;*.2011;3(4): 113-123.
12. Al-Maatouq MA. Hospitalization patterns of diabetic patients: a six-year experience at King Khalid University hospital. *Ann Saudi Med* 1994; 14:486–90.
13. Ajayi EA, Ajayi OA. Pattern and outcome of diabetic admissions at a federal medical center: A 5-year review. *Ann Afr Med.* 2009;8(4):271–5.
14. Umoh VA, Otu AA, Enang OE, Okereke QO, Essien O, Ukpe I. The pattern of diabetic admissions in UCTH Calabar, South Eastern Nigeria: a five year review. *The Nigerian Health Journal* 2012; 12(1):7-11.
15. Ogbera O. Burden of diabetic illness in an urban hospital in Nigeria. *Trop Doct.* 2007; 37(3):153-4.
16. Unachukwu CN, Uchenna DI Young E. Mortality among diabetes in-patients in Port-Harcourt, Nigeria. *African Journal of Endocrinology and Metabolism* 2008;7(1) 1-4
17. Kefale AT, Eshetie TC, Gudina EK. Hospitalization Pattern and Treatment Outcome Among Diabetic Patients Admitted to a Teaching Hospital in Ethiopia: A Prospective Observational Study *Journal of Health, Medicine and Nursing* 2016; 28: 34-41.
18. Unadike BC, Essien I, Akpan NA, Peters EJ, Essien OE. Profile and outcome of diabetic admissions at the University of Uyo Teaching Hospital, Uyo. *Int. J. Med. Med. Sci.*2013; 5(6):286-289.
19. Elsayed AM, Elbadawy AM, Ibrahim WM, Mahfoz MS, Abd Elmoniem RO. Indications and Outcome of Admission of Patients with Diabetes into Benha University Hospitals, Egypt: A

- Prospective Study. *BMFj* 2021; 38(1):166- 279.
20. Okafor CI, Ofoegbu E. Indications and Outcome of Admission of Diabetic Patients into The Medical Wards in a Nigerian Tertiary Hospital. *NMJ* 2011; 52(2):86-89.
 21. Adem A, Demis T, Feleke Y. Trend of diabetic admissions in Tikur Anbessa and St. Paul's University Teaching Hospitals from January 2005-December 2009, Addis Ababa, Ethiopia. *Ethiop Med J.* 2011; 49(3):231–8.
 22. Bchir A. Hospital morbidity in an urban district in Tunisia Source: *East. Mediterr. Health J* 1998; 4:94-9.
 23. Seaquist ER, Anderson J, Childs B, Cyrer P, Dagogo-Jack S, Fish L, Heller SR, et al. Hypoglycemia and Diabetes: A Report of a Workgroup of the American Diabetes Association and The Endocrine Society. *Diabetes Care.* 2013; 36:1384–95.