Research Article ISSN 2771-5906

Trends in Internal Medicine

Diabetic Emergencies in Hospitals at the Sylvanus Olympio University Hospital Center in Lomé

Tchamdja Toyi[1*], Djalogue Lihanimpo[1], Akakpo Komlan[2], Kodjo Kossi[2], Tovignikou Sosso[2], Mossi Komi Edem[2], M'bortché B Kodjo[2] and Balaka Abago[2]

[1]*Department of Internal Medicine, CHU Kara, University of Kara, Togo.*

[2]*Department of Internal Medicine, CHU de Lomé, University of Lomé, Togo.*

[*]Correspondence:
Dr. Tchamdja Toyi, CHU of Kara, Département of Internal Medicine, Health sciences faculty, University of Kara, Togo.

Received: 28 Dec 2024; **Accepted:** 23 Jan 2025; **Published:** 31 Jan 2025

Citation: Tchamdja Toyi, Djalogue Lihanimpo, Akakpo Komlan, et al. Diabetic Emergencies in Hospitals at the Sylvanus Olympio University Hospital Center in Lomé. Trends Int Med. 2025; 5(1): 1-5.

ABSTRACT

Objective: *To describe the management of acute metabolic complications of diabetes in the multipurpose resuscitation services and the intensive care unit of internal medicine at the Sylvanus Olympio University Hospital in Lomé, Togo.*

Methods and Patients: *Retrospective descriptive study carried out from January 1, 2017 to December 31, 2020 (04 years) in the multipurpose resuscitation services and the intensive care unit of internal medicine of the CHU-Sylvanus Olympio of Lomé. Included in the study were any diabetic patient of any sex and age greater than or equal to 18 years who had an acute complication of sugar diabetes during the study period.*

Results: *The frequency of acute metabolic complications of diabetes was 2.94%. The mean age of patients was 52 years (range 19-89 years). There was a female predominance with a sex ratio of 0.51. Type II diabetes was found in 86.23% of patients. The main cardiovascular risk factors were high blood pressure (34.04%) and family history of diabetes (24.63%). The most common reasons for admission were impaired consciousness (94.20%), impaired general condition (77.53%), and respiratory difficulties (39.13%). The acute metabolic complications identified were: diabetic ketoacidosis (72.46%), hyperosmolar hyperglycemia syndrome (18.84%), hypoglycemia (7.98%) and lactic acidosis (0.72%). The lethality rate remained high at 34.78%. It was higher in cases of hypoglycemic coma (54.5%) followed by hyperosmolar coma (30.80%).*

Conclusion: *Acute complications of diabetes are relatively frequent in the multipurpose resuscitation services and the intensive care unit of internal medicine in Lomé. They are sources of death, hence the interest in prevention.*

Keywords

Diabetes, Ketoacidosis, Hyperosmolar hyperglycemia syndrome, Hypoglycemia, Lomé (Togo).

Introduction

Diabetes is a metabolic disease characterized by the presence of chronic hyperglycemia resulting from insulin secretion deficiency, insulin resistance, or both [1,2]. It represents a real public health issue worldwide due to its increasing frequency, morbidity, mortality, and economic cost [3]. Diabetes is on the rise worldwide and countries are struggling to keep up [4]. According to the International Diabetes Federation (IDF 2019), it is estimated that there are 463 million people living with diabetes, or 9.3% of adults aged 20 to 79 years, have diabetes. According to 2019 estimates, it is expected that 578.4 million adults aged 20 to 79 years by 2030 and 700.2 million by 2045 will be living with diabetes [5]. Whether type 1 or type 2, diabetes mellitus develops in a chronic manner and results in two types of complications: chronic or

degenerative complications and acute complications, which are serious accidents that can be life-threatening in the short term.

In developed countries, particularly in the United States and France, the incidence of acute complications of diabetes is estimated at between 4.6 and 8 episodes per 1000 diabetic patients. It represents approximately 4 to 9% of the causes of hospitalization of diabetics [6,7].

In Africa, diabetes is now a major concern in developing countries, particularly in sub-Saharan Africa, where the prevalence is estimated at 5.7%. This is the region of the world with the highest percentage of undiagnosed diabetes cases (69.2%) [5]. Diabetes complications are common and are responsible for considerable morbidity and mortality. Epidemiological studies show that the frequency of acute complications remains high, ranging from 12.4% to 25.5% [5,8]. A study on diabetic emergencies in Lomé in 2013 found that 1.30% of diabetic patients hospitalized in the internal medicine intensive care unit of the Sylvanus Olympia University Hospital in Lomé (CHU SO) suffered from metabolic complications of diabetes [9]. Acute metabolic complications of diabetes are responsible for a large number of admissions to intensive care units [10]. Given their increasingly high frequency and the difficulty of their management, it seemed interesting to us to initiate this work, the general objective of which was to describe the management of acute metabolic complications of diabetes mellitus in the multi-purpose resuscitation services and the internal medicine intensive care unit of the SO University Hospital.

Material and Method

This is a descriptive retrospective study of the records of diabetic patients hospitalized from January 1, 2017 to December 31, 2020, a period of 4 years.

The study consisted of a review of records of diabetic patients hospitalized in the multipurpose resuscitation department and in the intensive care unit of the SO University Hospital of Lomé. The sample consisted of records of patients with acute complications of diabetes hospitalized in the multipurpose resuscitation departments and the intensive care unit of the Sylvanus Olympio University Hospital of Lomé.

Included in the study were any diabetic patient of any gender and age greater than or equal to 18 years who had an acute complication of diabetes mellitus during the study period. Not included were any diabetic patient under 18 years of age and/or any diabetic patient who had an acute complication of diabetes outside our study period.

Data collection was carried out using a form previously established. Each file included epidemiological, clinical, paraclinical and evolutionary data.

The following parameters were studied:

- **Epidemiological data:** age, sex, occupation, marital status, area of residence.
- **Clinical data:** duration of evolution and circumstances of discovery, treatment undertaken before the patient's hospitalization, type of diabetes. Personal history; family history of diabetes; eating habits and lifestyle. Weight, height, temperature, functional and physical signs.
- **Paraclinical data:** blood glucose (maximum blood glucose >7.1 mmol/l; normal blood glucose [4.4 – 6.1] mmol/l; minimum blood glucose <4.1 mmol/l), ketonuria, glycosuria, glycated hemoglobin, creatinine, microalbuminuria, 24-hour proteinuria, blood ionogram, triglycerides and cholesterols, blood count, chest X-ray, electrocardiogram, cytobacteriological examination of urine.
- **Complications:** Presence of ketonuria in diabetic ketoacidosis, high blood osmolarity in hyperosmolar hyperglycemia syndrome, low blood sugar in hypoglycemia and high blood lactemia in lactic acidosis.
- Evolution.

The data processing was done using Epidata 3.1 software. All analyses were performed using R © software. Descriptive statistics were performed and the results were presented with tables of numbers and percentages for qualitative variables. Quantitative variables were presented as means (standard deviation) or medians with their interquartile range (IQR).

The operational definitions were:

- The type of diabetes:
  - Insulin-dependent diabetes or type 1 diabetes based on the following criteria: patient aged under 30 and/or very marked functional symptoms, associated with weight loss and/or presence of ketone bodies.
  - Non-insulin-dependent diabetes or type 2 diabetes based on the following criteria: obese or normal weight patients, with moderate symptoms, without ketonuria; all patients who did not have ketonuria and responded favorably to oral antidiabetics.
  - Gestational diabetes for diabetes that appears during pregnancy.
- Maximum blood glucose >7.1 mmol/l; Normal blood glucose [4.4-6.1] mmol/l; Minimum blood glucose <4.1 mmol/l
- The diagnosis of lactic acidosis was made in the face of a polyalgic syndrome associating muscular symptoms, such as cramps and myalgia, and chest pain associated with an absence of ketonuria and a high ion gap (greater than 15 mEq/l) in a type 2 diabetic on metformin.

Results

Sociodemographic data

From January 1, 2017 to December 31, 2020, we collected 191 patient records, of which 138 suffered from acute complications of diabetes out of the 4,683 patient records hospitalized in the multipurpose intensive care and intensive care unit departments of the SO University Hospital of Lomé for diabetes. The frequency of acute metabolic complications of diabetes was 2.94%. The mean age was 52 years and a median age of 54 years. The extremes of age were 19 and 89 years. The age range of 50 to 70 years was

46.37%. The male gender was 34.05% (n=47) with a sex ratio of 0.51. The informal sector was the professional group represented in (65.21%) and retirees in (15.21%). In terms of marital status, 72.46% were married compared to 13.66% single. Similarly, 83.33% of patients resided in urban areas.

Clinical Data

Duration of Diabetes Development

In our study population, 40.57% of patients were known to be diabetic for a period of between 5 and 10 years.

Type of Diabetes

In our series, 86.23% of patients had type 2 diabetes, type 1 represented 13.04% and gestational diabetes 0.73%.

Treatment Before Hospitalization

In our study 38.53% of patients were on sulfonamides while 21.01% were not on treatment. Table 1 shows the distribution of patients according to treatment before hospitalization.

Table 1: Distribution of patients according to treatment before hospitalization.

	Effective	Percentage
Sulfonamides	42	38.53
Insulin alone	28	25.67
Biguanides	27	24.77
ADO* Association	08	07.37
ADO* + Insulin	04	03.67
Total	109	100

*: oral antidiabetics

Background and Lifestyle

In our series, high blood pressure represented 34.04% of the personal history. Family history of diabetes was found in 24.63% of patients.

Reasons for Admission

On admission, 94.20% of patients presented with impaired consciousness followed by deterioration of general condition in 77.53% and respiratory difficulties (39.13%).

Physical Signs

The most common physical signs were impaired consciousness (94.20 %), polyuria-polydipsia syndrome (40.57%), dyspnea (39.13 %), hyperthermia (34.78 %). Table 2 shows the distribution of patients according to physical signs.

Factors of Decompensation of Acute Metabolic Complications

In our study, 41.30% of patients had an infection and 24.63% had a therapeutic break.

Paraclinical Data

In our series 92.02 % of patients had hyperglycemia at admission. Ketonuria was positive at one cross in 15.94% of patients, at two crosses in 36.96% of patients and at three crosses in 19.56% of patients. Of 138 patients who performed glycated hemoglobin, 83.33% had a glycated hemoglobin level higher than normal. Regarding blood ionogram, hypernatremia (37.76%), hyponatremia (36.23%) and hypokalemia (36.95%) were the most observed ionic disorders.

Overview of Acute Complications

In this study, ketoacidotic coma accounted for 72.46% of complications (Table 3).

Table 2: Distribution of patients according to physical signs.

	Effective	Percentage
Disturbances of consciousness	130	94.2
Polyuro-polydipsic syndrome	56	40.57
Dyspnea	54	39.13
Hyperthermia	48	34.78
Asthenia	23	16.16
Weight loss	20	14.49
Obesity	19	13.76
Muscle pain	19	13.76
Foot sore	16	11.59
Abdominal pain	16	11.59
Hypotension	14	10.14
Tonic-clonic seizures	4	2.89
Acetone breath	4	2.89
Hemiplegia	3	2.17
Dysuria	2	1.44
Memory disorder	2	1.44
Visual blur	2	1.44
Hustle	2	1.44
Dizziness	2	1.44

Table 3: Distribution of patients according to acute complications of diabetes.

	Effective	Percentage
Diabetic ketoacidosis coma	100	72.46
Hyperglycemia hyperosmolar syndrome	26	18.84
Hypoglycemic coma	11	07.98
Lactic acidosis with or without coma	1	0.72

Diabetic Ketoacidosis

Diabetic ketoacidosis was found in female subjects in 69%. Persons aged over 50 years represented 53%. Type 2 diabetes was noted in 84% of patients (Table 4).

Hyperglycemic Hyperosmolar Syndrome

Hyperglycemia hyperosmolar syndrome was found in female subjects at 57.7%. Persons aged over 50 years represented 73.1%. Type 2 diabetes was noted in 88.5 % of patients and 61.5% presented dehydration (Table 5).

Hypoglycemic Coma

Hypoglycemic coma was noted in 7 female patients. Eight of the 11 patients were over 50 years of age and all patients had type 2 diabetes.

Evolution and Prognosis

The average length of stay was 4 days +/-1 with 29.41% of patients having a hospital stay of less than 72 hours and 43.47% of patients between 72 hours and 7 days. The case fatality rate was 34.78%. Mortality was higher in hypoglycemic coma (54.5%) followed by hyperosmolar coma (30.80%).

Table 4: Distribution of patients according to the occurrence of diabetic ketoacidosis and characteristics.

	Effective	Percentage
Sex		
Female	69	69
Male	31	31
Age groups (years)		
<30	16	16
30-50	31	31
50 and over	53	53
Duration of evolution (years)		
Less than 5	45	45
Between 5 and 10	40	40
10 and more	15	15
Type of diabetes		
D gestational	0	0
DT1	16	16
DT2	84	84
Dehydration		
No	75	75
Yes	25	25

Table 5: Distribution of patients according to the occurrence of hyperglycemia hyperosmolar syndrome.

	Effective	Percentage
Sex		
Female	15	57.69
Male	11	42.31
Age groups (years)		
<30	0	0
30-50	7	26.92
50 and over	19	73.08
Duration of evolution (years)		
Less than 5	14	53.84
Between 5 and 10	8	30.76
10 and more	4	15.40
Type of diabetes		
D gestational	1	03.85
DT1	2	07.69
DT2	23	88.46
Dehydration		
No	16	61.54
Yes	10	38.46

Discussion

Epidemiological Data

The frequency of metabolic complications in our study was 2.94% of hospitalizations. This rate is close to that observed by Diakité [11]. Djibril et al., in Togo in 2013 [9] had found a lower frequency at 1.30% in medical resuscitation of internal medicine of the CHU-SO. Tchaou et al., in Parakou [12] in Benin had noted a higher frequency 7.8%. These different rates are lower than that of other African authors [13,14]. This difference could be explained by the size of our sample, and the study period.

Sociodemographic Data

In our series, there was a female predominance with a sex ratio of 0.51. This female predominance had also been found by Sow et al. [15] and Ndour Mbaye in Senegal [13]. However, Mossi et al. in Togo had noted a male predominance [16]. The average age in our study was 52 years with extremes of 19 and 89 years. This young average age characterizes African diabetics. This result is comparable to that found by Djibril et al. [9] in Togo and those of other authors in Africa [17,18]. On the other hand, in France, the average age of diabetic patients was higher (64 years) [19]. This state confirms the young age of African diabetics. A family history of diabetes was found in 24.63%. Mossi et al. [16] and Sow et al. [15] had found a family history in 31.17% and 51.7% of their respondents respectively.

Clinical Data

The most common physical signs were impaired consciousness (94.20%), polyuropolydipsia syndrome (40.57%), dyspnea (39.13%), hyperthermia (34.78%). These findings were also made by Sidibe et al. [20] and by Sow et al. [15]. Kussmaul-type dyspnea is a very important element in the diagnosis of diabetic ketoacidosis. Patients with hyperosmolarity are dehydrated and rapidly develop hyperthermia. This hyperthermia may also reflect an infection which is a factor in the decompensation of diabetes.

Decompensation factors

In our study, infection was predominant in 41.30% of cases, treatment discontinuation in 24.63% of cases. These results are comparable to data from the literature [9,20]. For Sidibe et al. [20] infection was predominant in 84% and treatment discontinuation in 6% of cases. In Burkina, Ouedraogo et al. [21] found that chronic hyperglycemia, dietary deviations, therapeutic errors and infections are responsible for acute complications of the disease. In Sow et al. [15] in Senegal, infection represented 46.05% of the triggering causes.

Types of Complications

Ketoacidosis was the predominant complication in 72.46%. Female gender, disease duration between 5 and 10 years as well as people over 50 years old were the most affected. This result is comparable to that of Sow et al. [15] who found that diabetic ketoacidosis represented 63% of diabetic comas against 22.6% and 27.9% reported respectively by Sidibe et al. [20] in Mali and Tchaou et al. [12] in Benin. The frequency of hypoglycemic coma was 07.98%. This result is comparable to that of Sow et al. [15] who noted 5.85%. On the other hand, Tchaou et al. [12] found a rate significantly higher than 30.2%. Hyperglycemia hyperosmolar syndrome represented 18.84% of our sample. For Sidibe et al. [20] hyperosmolar coma was 54.54% compared to 41.9% for Tchaou et al. [12] and 2.4% for Sow et al. [15]. We had only one case of lactic acidosis. This result is explained by the fact that in our

environments the dosage of lactatemia is not systematic. In the study of Diakité no case of lactic acidosis was reported [11].

Length of Hospitalization

A hospital stay of between 3 and 7 days was noted in 43.45% of patients. Our observations are similar to those of Tchaou et al. [12] whose average length of stay in intensive care was 3.7 ± 3.4 days. On the other hand, Odou et al. [22] reported an average length of stay of 2.5 ± 2 days. These relatively short periods of intensive care reported in the various studies could be explained by the importance of intensive care and the close monitoring that these patients benefit from, conditions that allow the emergency to be quickly resolved in order to avoid the occurrence of cerebral suffering related to dysglycemia.

Evolution

The lethality rate was high in our series (34.78%) but similar to that of Djibril et al. which was 35% [9]. This proportion is significantly higher than that of Sow et al. (5.85%) [15]. The high lethality rate in our series is evidence of late management, the frequency of infections, treatment discontinuation, lack of awareness of diabetes and the lack of infrastructure for adequate management.

Conclusion

Metabolic complications of diabetes are relatively common in the multipurpose intensive care units and the intensive care unit of internal medicine in Lomé. They most affect young adult female subjects. The main complication is diabetic ketoacidosis. Raising awareness and educating diabetics and improving intensive care management methods would help reduce death rates and the deleterious effects of acute metabolic complications of diabetes mellitus.

References

1. Grimaldi A. Traité de diabétologie tome 1 Flammarion Médecine sciences. Paris. 2005; 3-263.
2. American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes care. 2004; 27: 5-10.
3. Grimaldi A, Hartemann Heurtier A. 1-Le diabète un problème de santé publique, Guide pratique du diabète (Quatrième Édition). Elsevier Masson. 2009; 1-2.
4. Carine Franc. Le diabète Des chiffres alarmants. Med Sci. 2013; 29: 711-714.
5. Fédération internationale du Diabète. Atlas du Diabète de la FID. Bruxelles. 2019; 9: 11-34.
6. Guillermo E Umpierrez, Mary Beth Murphy, Abbas E Kitabchi. Diabetic Ketoacidosis and Hyperglycemic. Hyperosmolar Syndrome. Diabetes Spectr. 2002; 15: 28-36.
7. Orban JC, Ichai C. Complications métaboliques aiguës du diabète Réanimation médicochirurgicale, hôpital Saint-Roch, CHU de Nice, 5, rue Pierre-Dévoluy, 06006 Nice cedex, France. Réanimation. 2008; 17: 761-767.
8. Monabeka HG, Nsakala Kibangou N. Aspects épidémiologiques et cliniques du pied diabétique au CHU de Brazzaville. Bull Soc Pathol Exot. 2001; 94: 246-248.
9. Djibril MA, Balaka A, Nemi KD, et al. Urgences diabétiques à Lomé: aspects épidémiologique et pronostique. J Rech Sci Univ Lomé. 2013; 15: 353-58.
10. Dionadji M, Oumar A, Nodjito M, et al. Prévalence des complications médicales chez les diabétiques hospitalisés à Ndjamena. Health Sci Dis. 2015; 16: 14.
11. Diakité YD. Complications métaboliques aiguës du diabète en milieu de réanimation au point G janvier 2001 à décembre 2005. Thèse Med Bamako. 2007; 145: 2005.
12. Tchaou BA, Gomina M, Agbo AH, et al. Complications aiguës métaboliques du diabète sucre dans l'unité de réanimation de l'hôpital universitaire de Parakou (bénin). Med Afr Noire. 2014; 24: 209.
13. Mbaye MN, Niang K, Sarr A, et al. Aspects épidémiologiques du diabète au Sénégal: résultats d'une enquête sur les facteurs de risque cardio-vasculaires dans la ville de Saint-Louis. Med maladies Metab. 2011; 5: 659-64.
14. Faraoun K, Ayad N, Doud M, et al. Profil des patients diabétiques vus en urgence pendant le mois de Ramadan à la clinique Laribere, CHU Oran Diabetes Metab. 2014; 40: 57.
15. Sow D, Diedhiou D, Mané ID, et al. Étude des facteurs de risque cardiovasculaire chez les patients diabétiques de type 2 au Centre Marc Sankalé de Dakar. RAFMI. 2018; 5: 43-49.
16. Mossi KE, Balaka A, Tchamdja T, et al. Prévalence des complications du diabète sucré à la Clinique médico-chirurgicale du CHU Sylvanus Olympio de Lomé. Revue africaine de médecine interne. 2019; 6: 3.
17. Azanmasso H, Tchonda E, Alagnide E, et al. Qualité de vie des patients diabétiques en Afrique: à propos d'une étude bi-centrique. Médecine des Maladies Métaboliques. 2015; 9: 603-609.
18. Diallo AM, Lokrou A, Diallo MM, et al. Suivi à long terme des patients diabétiques en Afrique subsaharienne: caractéristiques épidémiologiques et cliniques d'une cohorte ivoirienne. Médecine des Maladies Métaboliques. 2015; 9: 216-219.
19. Hamdi S, Kammoun I, Grira W, et al. L'observance thérapeutique chez les patients diabétiques déséquilibrés: évaluation et facteurs interférant. Ann Endocrinol. 2016; 77: 512.
20. Sidibe AT, Dembélé M, Cissé IAH, et al. Les urgences diabétiques dans le Service de Médicine Interne au Mali. Med Afr Noire. 2005; 5: 552-554.
21. Ouedraogo M, Ouedraogo SM, Birra E, et al. Complications aiguës du diabète sucré au centre hospitalier national Yalgado Ouedraogo. Med Afr Noire. 2000; 47.
22. Odou K. Complications métaboliques aigues du diabète au service d'accueil des urgences du CHU Gabriel Touré: aspects épidémio-cliniques pronostique et thérapeutiques. 2019; 92-94.