

Clinical Profile of Patients with Diabetic Coma in Dr. Soetomo State/Teaching Hospital in Year 2013-2016

Francisca Victoria^{a*}, Suwandito^b, Rio Wironegoro^c

^afranciscavictoria96@yahoo.com

^a Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia 60131

^b Department of Biochemistry Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

^c Department of Internal Medicine, Faculty of Medicine, Universitas Airlangga, Dr. Soetomo Hospital, Surabaya, Indonesia

Abstract

Background: The known conditions of diabetes which may cause coma are diabetic ketoacidosis (DKA), hyperglycemic hyperosmolar state (HHS) and hypoglycemia (Shah and Joshi, 2004). This diabetic coma can be an emergency case within three hours if not resolved (Shah and Joshi, 2004). **Objective:** This study aims to study the profile of diabetic coma sufferers in order to improve the understanding of diabetic coma and thus improves services for patients. **Method:** This was a retrospective study by assessing patients' medical record and analyzed descriptively. **Result:** The results obtained from 80 patients with the majority of women (62%). Diabetic coma attacks mostly at the age of 50-59 years (36%). Based on historical data, the major complaints were consciousness disturbance (31%) and loss of consciousness (31%). Patient's blood pressure results mostly (30%) was noted to show that patients suffer from first-stage hypertension, whereas on other physical examinations such as pulse and body temperature, generally obtained normal results with a percentage of 80% and 56% respectively. Respiration rate for hypoglycemic patients are mostly normal, but 97% of hyperglycemic crisis patients present high rate of respiration. In blood tests, the hemoglobin and platelet counts were predominantly normal, with percentages of 61%, and 58%, respectively, but the leukocyte levels of patients mostly were abnormally high (64%). Examination of patient's renal function in patients with post hypoglycemic coma shows that majority of patients get normal results, 62% of normal creatinin serum and 67% of normal BUN. In the other hand, for patients with hyperglycemic crisis, mostly shows an elevated creatinin serum and BUN, 79% and 86% each. The patient's body ion levels recorded were sodium and potassium levels, both of which were predominantly classified as normal, 49% and 51% respectively. With random blood sugar test, 37 patients (55%) with hypoglycemia showed abnormally low blood sugar outcomes, but 86% of patients with hyperglycemic crisis showed abnormally high blood sugar. Examination of blood gas analyzes records the values of blood acidity, partial pressure of oxygen and carbon dioxide, HCO₃⁻ level, base excess, and oxygen saturation. Results show a predominantly abnormal results (abnormally high for partial oxygen pressure but abnormally low for blood acidity, partial pressures of carbon dioxide, HCO₃⁻, and base excesses). Examination of albumin content, 53% showed normal results. Most results of thorax photo (22%) showed no abnormality. With proper treatment, the majority of patients with hypoglycemia went home with improved condition, whereas most patients with hyperglycemic crisis died even after given treatments.

Keywords: diabetic coma, diabetic emergencies, diagnosis, lab examination, therapy, clinical profile, Surabaya, Indonesia.

INTRODUCTION

Diabetic states that are known to cause coma include diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic status states (HHS) or hypoglycemia (Shah and Joshi, 2004). Where this diabetic coma can become an emergency case within three hours if not addressed (Shah and Joshi, 2004). Diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic status (HHS) are two serious acute metabolic complications, but with the development of insulin therapy the most commonly encountered case of diabetic coma is hypoglycemia due to drugs (Shah and Joshi, 2004). Given the effects caused by the diabetic coma that can result in death, it will be explained the patient's condition to see what conditions occur. This picture is expected to be an input and additional information for the community in an effort to prevent the occurrence of diabetic coma and assist health workers in determining the treatment of patients with diabetic coma in the future.

METHOD

The purpose of this study was to describe the characteristics of patients with diabetic coma at Dr. Soetomo Hospital in 2013 – 2016. Therefore, this study uses a Descriptive Research design of Retrospective Design by looking at and examining the medical records of patients with diabetic coma at Dr. Soetomo Hospital during the period January 1, 2013 to December 31, 2016. The research sample is the medical record of a patient diagnosed with a diabetic coma at Dr. Soetomo Hospital in 2013 – 2016. Samples are taken by content analysis techniques, methods for studying and / or retrieving information from documents (in this case in the form of medical records). This technique was chosen to describe patient data with the ultimate goal of a reliable conclusion.

The variables used in this study were the conditions obtained from the patient when he first entered the hospital, including age, gender, blood profile, kidney examination results, sodium and potassium levels, blood sugar examination, blood gas analysis results, albumin levels, thoracic photo examination, and outcome. The data collection procedure of this study is carried out by collecting and reading the data available in the medical record, which will then be compiled to debunk the data obtained so that it can finally show the characteristics of the population studied. The variable data in this study are analyzed descriptively, the data will be presented in a table. The data processing and analysis used is descriptive statistical Data processing using Microsoft Excel 2011 computer software. Patient data will be accessed after obtaining permission from the hospital and researchers guarantee the confidentiality of the patient's identity data. The results of the research will only be used for the purpose of developing medical knowledge and not for any other purpose.

RESULTS AND DISCUSSION

Based on age data of patients with diabetic coma disease at Dr. Soetomo Hospital in 2013 - 2016, it was found that diabetic coma was most experienced by patients between the ages of 50-59 years, with a percentage of 36%.

Table 1. Patients' Age

Age (years)	Amount	Percentage (%)
< 40	5	6
40 – 49	11	14
50 – 59	29	36
60 – 69	17	21
70 – 79	16	20
>= 80	2	3

Based on patients' gender data, it was found that diabetic coma was most experienced by female patients, namely with a percentage of 62% while the other 38% was male.

Table 2. Patients' Gender

Gender	Amount	Percentage (%)
Female	50	62
Male	30	38

The most common diagnosis given to patients is diabetes post coma hypoglycemia with a percentage of 83%. Meanwhile, the diagnosis of DKA is 6% and HHS is obtained by a percentage of 11%.

Table 3. Patients' Diagnosis

Diagnosis	Amount	Percentage (%)
DKA	5	6
HHS	9	11
DM <i>post</i> hypoglycemia coma	66	83

The most common symptoms patients experienced were loss of consciousness (31%) and unconsciousness (31%). Meanwhile, other symptoms include weak body, vomiting and nausea, and wounds that do not heal.

Table 4. Symptoms

Symptoms Reported	Amount	Percentage (%)
Loss of consciousness	25	31
Unconscious	25	31
Weak body	20	25
Vomiting and nausea	7	9
Wounds wont heal	1	1
No record	2	3

it was found that the most common blood pressure found was stage 1 hypertension, which was a percentage of 30%.

Table 5. Patients' Blood Pressure

Blood Pressure	Amount	Percentage (%)
Normal	14	18
Pre hypertension	22	28
Stage 1 hypertension	24	30
Stage 2 hypertension	19	23
No data	1	1

The most pulse obtained is a pulse of 60-100 x / minute, which is a percentage of 80%.

Table 6. Patients' Pulse

Pulse (per minute)	Amount	Percentage (%)
< 60	0	0
60-100	64	80
>100	14	18
No data	2	2

Based on the respiratory rate data of patients with post-coma hypoglycemia diabetes, the most common respiratory rate obtained is a breath rate of 14–20 x/min. As for patients with hyperglycemia crisis, all existing patients were recorded with a respiratory rate of more than 20 x / min. The data will be classified separately because the results obtained between the two groups (diabetes post coma hypoglycemia and hyperglycemic crisis (both DKA and HHS)) are different.

Table 7.1. Respiratory Rate of post coma hypoglycemia patients

Respiratory Rate (per-minute)	Amount	Percentage (%)
<14	0	0
14 – 20	0	0
>20	13	97
No data	1	7

Table 7.2. Respiratory Rate of hyperglycemic crisis patients

Respiratory Rate (per-minute)	Amount	Percentage (%)
<14	0	0
14 – 20	41	62
>20	23	35
No data	2	3

Based on body temperature data of patients with coma disease, the most body temperature obtained is normal temperature (36.6-37.2 °C), which is a percentage of 56%.

Table 8. Patients' Body Temperature

Body Temperature	Amount	Percentage (%)
<36,6 °C	27	34
36,6-37,2 °C	45	56
> 37,2 °C	8	10

Lab Findings

Patients with normal (male: 13-18 g/dL : female 12-16 g/dL) hemoglobin amounted to 61%, while abnormal results were obtained in the amount of 38% (for abnormally low), none of the patients with high abnormal hemoglobin and the other 1% have no data recorded.

Table 9. Patients' Hemoglobin

Hemoglobin	Amount	Percentage (%)
Normal	49	61
Abnormally low	30	38
Abnormally high	0	0
No Data	1	1

Normal leukocytes amounted to 36%, while high abnormal results were obtained at 64% and none of the patients were recorded with low abnormal leukocytes.

Table 10. Patients' Leukocyte

Leukocyte (x 10 ³ / mm ³)	Amount	Percentage (%)
3,2 - 10	29	36
< 3,2	0	0
> 10	51	64
No Data	0	0

Based on the data from the patient's laboratory examination, it was found that patients with normal platelets amounted to 58%, while abnormal results were obtained a total of 8% abnormal low, and 29% abnormal high, the other 5% no information.

Table 11. Patients' Thrombocyte

Thrombocyte (/mm ³)	Amount	Percentage (%)
170 - 380	47	58
< 170	6	8
>380	23	29
No data	4	5

Patients with post-diabetic coma hypoglycemia had a normal serum creatinine of 62%, while abnormal results were obtained by 14% for abnormally low and another 24% recorded abnormally high. As for patients with hyperglycemia crisis, it is dominated by high abnormal outcomes (79%). The data will be classified separately because the results obtained between the two groups (diabetes post coma hypoglycemia and hyperglycemic crisis (both DKA and HHS)) are different.

Table 12.1. Serum Creatinine of post coma hypoglycemia patients

Serum Creatinine	Amount	Percentage (%)
6-1,3	41	62
<6	9	14
>13	16	24

Table 12.2. Serum Creatinine of hyperglycemic crisis patients

Serum Creatinine	Amount	Percentage (%)
6-13	2	14
<6	1	7
>13	11	79

Patients with normal BUN amounted to 67% while abnormal results were obtained a number of 27% abnormal high and another 6% recorded abnormal low. As for patients with hyperglycemia crisis, it is dominated by high abnormal outcomes (86%). The data will be classified separately because the results obtained between the two groups (diabetes post coma hypoglycemia and hyperglycemic crisis (both DKA and HHS)) are different.

Table 13.1. Blood Urea Nitrogen of post coma hypoglycemia patients

BUN (mg/dL)	Amount	Percentage (%)
7-20	44	67
<7	4	6
>20	18	27

Table 13.2. Blood Urea Nitrogen of hyperglycemic crisis patients

BUN (mg/dL)	Amount	Percentage (%)
7-20	2	14
<7	0	0
>20	12	86

Based on the data from the patient's laboratory examination results, it was found that patients with normal (135-144 mEq/L) sodium levels amounted to 49%, while abnormal results were obtained a number of 35% abnormal low, 13% abnormal high and 3% others no information.

Table 14. Patients' Sodium level

Sodium	Amount	Percentage (%)
Normal	40	49
Low	28	35
High	10	13
No data	2	3

Patients with normal (3,6-4,8 mEq/L) Potassium levels amounted to 51%, while abnormal results were obtained a number of 27% abnormal low, 19% abnormal high and another 3% no information.

Table 15. Patients' Potassium level

Potassium level	Amount	Percentage (%)
Normal	41	51
Low	22	27
High	15	19
No data	2	3

It was found that patients with post-coma diabetic hypoglycemia upon hospital admission were mostly (55%) recorded with abnormally low Random Blood Sugar levels. Meanwhile, patients recorded with hyperglycemia crises (DKA and HHS) were dominated (86%) with high abnormal results. The data will be classified separately because the results obtained between the two groups (diabetes post coma hypoglycemia and hyperglycemic crisis (both DKA and HHS)) are different.

Table 16.1. Random Blood Sugar of post coma hypoglycemia patients

Random Blood Sugar	Amount	Percentage (%)
90-200 mg/dL	13	20
Low	37	55
High	11	17
No data	5	8

Table 16.2. Random Blood Sugar of hyperglycemic crisis patients

Random Blood Sugar	Amount	Percentage (%)
90-200 mg/dL	2	14
Low	0	0
High	12	86
No data	0	0

Patients were recorded with normal (7,35-7,45) pH levels of 6%, while abnormal results were too alkaline, they were obtained by 3% and abnormal results of acid in the amount of 71%, the other 20% were not stated.

Table 17. Patients' pH

pH	Amount	Percentage (%)
Normal	5	6
Kritis Rendah	57	71
Kritis Tinggi	2	3
No data	16	20

Patients with normal (35-45 mmHg) pCO₂ levels amounted to 28% while high abnormal results were obtained at 6% and abnormal low results at 46% while the other 20% were notified.

Table 18. Patients' pCO₂

pCO ₂	Amount	Percentage (%)
Normal	22	28
Low	37	46
High	5	6
No data	16	20

Patients with normal (75-100 mmHg) pO₂ levels amounted to 26%, while high abnormal results were obtained by 36% and low abnormal results by 18% while the other 20% were notified.

Table 19. Patients' pO₂

pO ₂	Amount	Percentage (%)
Normal	21	26
Low	14	18
High	29	36
No data	16	20

Patients with normal (22-26 mEq/L) HCO₃⁻ levels of 26%, high abnormal results obtained by 19% and low abnormal results of 35%, another 20% no information.

Table 20. Patients' HCO₃⁻

HCO ₃ ⁻	Amount	Percentage (%)
Normal	21	26
Low	28	35
High	15	19
No data	16	20

Patients with normal (-2 - +2 mEq/L) Base Excess levels amounted to 22% while high abnormal results were obtained at 19% and abnormal low results at 39% while the other 20% were notified.

Table 21. Patients' Base Excess

Base Excess	Amount	Percentage (%)
Normal	18	22
Low	31	39
High	15	19
No data	16	20

Patients with normal (95-100%) Oxygen Saturation levels amounted to 68%, while results less than normal were obtained by 12% and another 20% there was no information.

Table 22. Patients' Oxygen Saturation

Oxygen Saturation	Amount	Percentage (%)
Normal	54	68
Low	10	12
No data	16	20

It was found that patients with normal (3,4-5,4 g/dl) Albumin levels amounted to 53%, while low abnormal results were obtained at 44%, while the other 3% were not identified.

Table 23. Patients' Albumin

Albumin	Amount	Percentage (%)
Normal	42	53
Low	36	44
No data	2	3

The most commonly found photo results were no design with a percentage of 22%, while other results obtained were cardiomegaly and or aortosclerosis, pulmonary inflammation, pleural effusion, pulmonary TB, and pneumonia. 45% of the data was obtained without information.

Table 24. Patients' Thorax Photo

Thorax photo	Amount	Percentage (%)
Cardiomegaly and / Aortosclerosis	12	15
Pulmonary Inflammation	7	9
Pleural effusion	2	3
Pulmonary TB	2	3
Pneumonia	2	3
Normal	18	22
No data	37	45

Patients Outcome

Most patients with post-diabetic coma hypoglycemia go home and improved during the course of given therapy, with a percentage of 36%. While patients with hyperglycemia crisis (DKA and HHS) most patients (29%) died.

Table 25.1 Outcome of post coma hypoglycemia patients

Outcome	Amount	Percentage (%)
Go Home, recovered	4	6
Go Home , feeling better	24	36
Go Home , good	4	6
Go Home, weak	2	3
Died	3	5
No data	29	44

Table 25.2 Outcome of hyperglycemic crisis patients

Outcome	Amount	Percentage (%)
Go Home , recovered	1	7
Go Home , feeling better	1	7
Go Home, weak	2	14
Died	4	29
No data	6	43

CONCLUSION

Further research with more data needs to be done to get better data accuracy. The study was held continuously to see the patient's therapy results and the survival rate of the patient. It is expected that the data recording is more complete, because there are some data in the medical record that are not completed, such as patient complaints, blood gas analysis and therapy results. Education on diabetic coma and home care as well as moral support for patients and families.

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