



Chapter 58

Health care for patients with hyperglycemia in urgent and emergency situations

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Jéssica Batista dos Santos

E-mail: jessicabatista12373@gmail.com
Graduated in nursing and post-graduating in Urgency and Emergency Nursing and Intensive Care Nursing from FACESF (2023)

Emanuele Paula Lopes Cavalcanti

emanuelepaula10@gmail.com
Undergraduate nursing student

Ayara Almeida Souza Cabral

ayaracabral@gmail.com
pharmacy undergraduate

Thaís Carla Gonçalves Sampaio

thais.csgoncalves@gmail.com
Bachelor in nursing - Faculdade de Ensino de Minas Gerais

Rosa Naiara Cruz Chagas

naiarachagas@yahoo.com.br
Bachelor in nursing - Centro Universitário Maurício de Nassau

Leticia Marcelly Lima de Oliveira

lemarcelly31@gmail.com
Nursing student – Universidade Nilton Lins

Ana Claudia Rodrigues da Silva

enf.anaclaudia@hotmail.com

Bachelor in nursing

Nilécia Soares de Oliveira

Nurse - Unijorge
nileciaenfa@gmail.com

Roziâne Silva dos Santos

Bachelor in nursing - Centro Universitário Maurício de Nassau
anesilvasantos@gmail.com

Carlos Eduardo da Costa

Hospital Management Specialist - UNIASSELVI
eduardotelexfree10x@gmail.com

ABSTRACT

Research Question: What are the nursing care directed to the treatment of patients with Hyperglycemic Emergencies?

General and specific objective respectively: Identify in the literature what Health care is to be applied in the care of patients with Hyperglycemic Emergencies. Investigate the causes of Hyperglycemic Emergencies. Hypothesis: Health care aimed at treating patients with Hyperglycemic, such as glycemic control through insulin therapy, hydration, hemodynamic monitoring, ICU admission and diagnosis of the cause, favors the normalization of this condition.

Type of study: This is a narrative review.

Keywords: Hyperglycemic. Health Care

1 INTRODUCTION

This study focuses on discussing the health care of patients with hyperglycemia in urgent and emergency situations. Hyperglycemia is characterized by increased blood sugar, presenting fasting glucose values between 110 mg/dl and 125 mg/dl, one of the main causes being type 1 or type 2 diabetes mellitus. Type 1 diabetes mellitus, for example, consists of insulin resistance and is caused by factors such as sedentary lifestyle, poor diet, alcohol consumption, frequent and continuous stress, and genetic predisposition. The symptoms of hyperglycemia, due to the high concentration of glucose in the blood, can

lead to headache, excessive thirst, excessive urination, tiredness, weakness, and dizziness. Nausea, drowsiness, vomiting, and difficulty breathing may also occur.(1,2)

According to studies, hyperglycemia is related to deaths of patients who present critical health conditions, such as acute myocardial infarction, heart surgery, and sepsis. These deaths occur due to hypercatabolism, which is configured as an increase in energy expenditure by the body and the emergence of hyperglycemia even though the patient does not have diabetes mellitus (1,2,4,5).

The hyperglycemia detected in hospitalized patients with glucose levels higher than 140 mg/dl is called hospital hyperglycemia. It can be present in 38% of patients admitted to Intensive Care Units. Hyperglycemia is diagnosed in patients in three moments: patients with diabetes mellitus, hospitalized patients diagnosed with diabetes mellitus as a consequence of hospitalization and hospitalized patients with hyperglycemia acquired by stress as a consequence of hospitalization.(6-10)

The hospital hyperglycemia or stress hyperglycemia is characterized by the appearance of hyperglycemia in the patient, due to the alteration of blood glucose due to acute diseases, such as heart attacks, during hospitalization in an Intensive Care Unit. The causes that are associated with the manifestation of this hyperglycemia are the release of stress hormones, hence the use of this term for stress hyperglycemia, such as epinephrine, glucagon, GH and cortisol. The administration of certain drugs, such as corticoids and catecholamines, during the patient's hospital stay also contributes to the emergence of hospital hyperglycemia and the release of cytokines due to inflammatory processes such as sepsis or surgical trauma.(11,12)

The glycemical alteration in hospitalized patients with or without diabetes mellitus is related to some factors such as: health complications, increased number of infections and longer hospital stay that increase the chances of mortality of these patients. Blood glucose control in Hospital Hyperglycemia patients can reduce complications due to pre-existing hyperglycemia by other factors such as genetic predisposition. However, the existence of a hospital hyperglycemia picture in a hospitalized patient usually does not receive the necessary attention, because the care received by the patient is directed to the cause that led him to hospitalization.(6)

The relevance of this work is due to the importance of showing, not only to the academic and health population, but also to the population in general, the need to acquire new knowledge about health care for the treatment of people with hyperglycemia and in situations of urgency and emergency due to the high number of cases in inpatient units, in addition to the risk of mortality from this type of grievance.

Considering the above, it is relevant to answer the research question: What is the health care provided to patients with hyperglycemia in urgent and emergency situations? Furthermore, we follow the following hypothesis that: Healthcare directed to the treatment of the patient with Hyperglycemia, such as control of blood glucose through insulin therapy, hydration, hemodynamic monitoring, ICU admission and diagnosis of the cause, favors the normalization of this picture.(13)

Moreover, the general and specific objectives of this study are: Identify in the literature what are the health care procedures to be applied in the care of patients with hyperglycemic emergencies; investigate the causes and consequences of hyperglycemic emergencies.

2 METHODS

This is a narrative literature review that consists of a general reading and critical analysis of publications of research conducted by scholars in each area of knowledge. This type of methodology, as well as the others, enables the continuing education of students, professionals in education and other areas, since it allows these readers to update their knowledge and build new knowledge based on the researched works.

Thus, the narrative literature review of this work was based on scientific articles, monographs, dissertations, and books that address the theme of the research studied. The referred material was searched in the Google Academic and Scielo platforms. (15)

3 RESULTS AND DISCUSSION

3.1 HEALTH CARE IN EMERGENCY PATIENT CARE

The care given to a patient is essential for his/her recovery and hospital discharge in any case of illness. With the implementation of the Unified Health System (SUS) in 1988, it was possible to provide the population, in Intensive Care Units, with several types of care that until then could only be obtained in the private health network. This health care starts to be provided according to the complexities of the individual and not according to the order of arrival at the health care unit. (16)

To perform care in emergency units, the *Manchester* protocol is used, which classifies patients' risk by observing their vital signs, symptoms and pain complaints and thus classifying them by color to receive the proper care. Such care offered by SUS ranges from mechanical ventilation, arteriotomy, care with central venous access, verification of intravesical pressure, aspiration of tracheal secretion, cardiopulmonary resuscitation, among others.(16,17)

However, there are diseases that require more attention because they offer other risks to the individual's health by acting in parallel with another pathology or even being responsible for acquiring it. One of these diseases, which affects one person and brings other complications to other parts of the human body, is hyperglycemia. Thus, the general care performed by health professionals, such as nurses, must take into consideration not only the symptoms and causes of the disease, such as hyperglycemia, to be treated, but also the complicating agents of health due to its severity.(4)

As examples of health care to be used in patients with hyperglycemic emergencies and, consequently, to diabetes mellitus, we have those of psychosocial aspects in order to accompany the patient and his family members to control and learn to deal with the disease. This follow-up, in addition to the

procedures necessary for the control of hyperglycemia, will also serve to make the individual aware of the risk to health, such as impairment of blood vessels due to complications of the disease if it is not treated correctly (4).

Another care to be performed in the patient with hyperglycemia is the blood glucose monitoring that consists in the process of checking the blood glucose level through a device called glucometer. The purpose of using the glucometer is to guide the nurse to keep the blood glucose level as normal as possible so that the individual can be healthy and consequently have a routine of personal and work activities. Blood glucose monitoring enables health professionals to understand how medication administration, physical activity, and dietary re-education are acting on the patient's body.(118)

We also have health care directed to the orientation of the use of insulin in patients with diabetes mellitus due to hyperglycemia. In this care, the nurse will guide the patient on how to apply and store insulin, and where in the body it can best be administered. The application of insulin can be done by the patient himself, a family member, or a nurse, and the most recommended areas for application are the arms, buttocks, thighs, and abdomen. These applications must respect a rotation of places to avoid lipohypertrophy. Its storage must be done at a temperature between 2°C and 8°C or at room temperature, taking care not to exceed 25°C and 30°C, with a validity of 4 to 6 weeks.(18,19)

3.2 HYPERGLYCEMIC EMERGENCIES: CAUSES AND CONSEQUENCES

Hyperglycemic emergencies (HE) are caused by failures in the insulin secretion process or during insulin action in the body. These episodes of HE are often accompanied by dyslipidemia, hypertension, and endothelial dysfunction. The permanence of hyperglycemia in an individual for a long time causes several sequels to the patient, such as micro and macro intensity lesions of blood vessels, which may compromise the functionality of various organs, such as kidneys, nerves, heart among others (1).

The causes of the appearance of hyperglycemia in a person are related to the imbalance of insulin production or absorption in the body, which are: total or partial insulin deficiency, endocrine disorders, such as hyperthyroidism, pheochromocytoma, and acromegaly. The ingestion of medications such as corticoids, adrenergic agonists, phenytoin, beta blockers, chlorthalidone, diazoxide, pentamidine, dilantin, and alcohol are also causes of hyperglycemia. Dehydration is also configured as a cause of hyperglycemia through insufficient water intake, uremia, dialysis and diarrhea.(20)

In addition, there are other hospital procedures that can cause the onset of hyperglycemia in hospitalized patients, such as intravenous glucose solutions. There are also enteral and parenteral diets, dialysis solutions, and vasopressor substances, such as pharmacologicals, used to increase blood pressure and mean arterial pressure. Another cause of hospital induced hyperglycemia is the use of glucocorticoids which increase plasma glucose in patients with or history of diabetes. They are used to regulate the immune system against inflammatory processes, in cardiovascular homeostasis, and in energy metabolism.

However, they have side effects, such as increased hepatic gluconeogenesis, reduced glucose uptake, and others.(12,21)

Another cause of the onset of hyperglycemia in a person is due to hospital stress during their stay in an intensive care unit for the treatment of an acute disease, such as cardiovascular disease. During this treatment the patient has a great loss of nutrients from the body, such as water, blood, electrolytes, sodium, and potassium, essential for the body's balance. This process of loss or depletion decreases the response of the immune system in a way that hinders and delays the healing of injuries, for example. Therefore, the shorter the period patients are hospitalized for treatment of acute diseases, the lower their chances of developing hyperglycemia. (21-24)

Another cause of the appearance of hyperglycemia is due to the reduced presence of the mineral chromium in our body. Chromium is a mineral that is not present in the human body and can be found in some foods, such as meat, fruits, oilseeds, whole grains, legumes and brewer's yeast, beef liver, eggs, chicken, wheat, peppers, broccoli, grape juice, potatoes, garlic, apples, bananas, spinach. Their daily intake acts in the regulation of glucose homeostasis that activate the insulin receptors, oligopeptide chromodulin, which assist in the spread of insulin and thus preventing the increase in the level of glucose in the blood and consequently hyperglycemia.(25)

4 CONCLUSION

This study focused on discussing the health care used in the care of patients with hyperglycemic emergencies, the causes that give rise to this disease, and the contributions of the use of this care in patients with hyperglycemia.

Through the research and reading performed, we identified in the literature that the health care to be applied in the care of the patient with hyperglycemic emergencies and consequently diabetes mellitus, are: those of psychosocial aspects in order to accompany the patient and his family to control and learn to cope with the disease. Another general care to be performed in the patient with hyperglycemia is the blood glucose monitoring which consists of the process of checking the blood glucose level through a device called a glucometer. Monitoring blood glucose enables health professionals to understand how the administration of medication, physical activity, and dietary re-education is acting on the patient's body.

We also have health care directed to the orientation of the use of insulin in patients with diabetes mellitus due to hyperglycemia. This care, from the nurse, will consist of the orientation of how the patient will use the insulin, from its application, storage, and which region of the body can best be administered.

Also according to the study, we were also able to identify the causes of the emergence of hyperglycemia in a person are related to the imbalance of insulin production or absorption in the body, they are: total or partial insulin deficiency, endocrine disorders, such as hyperthyroidism, pheochromocytoma, and acromegaly. The ingestion of medications, such as corticoids, adrenergic agonists, phenytoin, beta

blockers, chlorthalidone, diazoxide, pentamidine, dilantin, and alcohol are also causes of hyperglycemia. Dehydration is also a cause of hyperglycemia through insufficient water intake, uremia, dialysis, and diarrhea.

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Another cause of hospital-acquired hyperglycemia is that induced by the use of glucocorticoids, which increase plasma glucose in patients with or history of diabetes. They are used to regulate the immune system against inflammatory processes, in cardiovascular homeostasis, and in energy metabolism. However, they have side effects, such as increased hepatic gluconeogenesis, reduced glucose uptake, and others.

Therefore, health care directed to the treatment of patients with hyperglycemia favors the normalization of this condition. Staying in intensive care unit for a short period of time also contributes to reduce the chances of the patient contracting hospital hyperglycemia.

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