ASSESSMENT OF KNOWLEDGE ABOUT INSULIN HANDLING AND ADMINISTRATION BY DOCTORS AT THE CENTRAL UNIVERSITY OUTPATIENT CLINIC

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ABSTRACT

Diabetes mellitus is a chronic endocrine-metabolic disease that is treated with medications that improve insulin production or action, or with exogenous insulin administration. Insulin must be stored and handled correctly in order to minimize application errors and ensure successful treatment and glycemic control. Taking this into consideration, the overall objective of this project is to assess the knowledge of physicians working at the Central University Outpatient Clinic (AUC) on the handling and administration of insulin. The assessment was carried out using a questionnaire, which aimed to evaluate errors and correct answers during patient guidance on the handling and administration of insulin. The results showed that the highest error rates were identified in sub-items related to the application technique, insulin homogenization, and possible application sites. On the other hand, the items with the highest accuracy were about contraindications for application in injured areas and the time insulin should be removed from the refrigerator before application and the needle should remain in the tissue. The study revealed gaps in the knowledge of insulin therapy among physicians at the Central University Outpatient Clinic (AUC), highlighting the need for educational interventions aimed at these professionals, in addition to promoting new studies to foster safety and efficacy in the treatment of diabetes mellitus.

Keywords: Health Education; Diabetes Mellitus; Insulin.

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic diseases with diverse etiologies, characterized by hyperglycemia, which results from deficient insulin secretion by pancreatic beta cells, peripheral resistance to insulin action, or both. Thus, it is a chronic endocrine-metabolic disease divided into two main types, type 1 diabetes mellitus (DM1), which accounts for 5% to 10% of cases, and type 2 diabetes mellitus (DM2), which accounts for 90% to 95% of cases (VILAR, 2020). Glycemic control is crucial for the prevention of micro- and macrovascular complications of diabetes mellitus. There, it is necessary to introduce

pharmacological treatments aimed at achieving glycemic control combined with lifestyle changes, one of the treatments being insulin therapy (BRUTSAERT, 2022). The dynamics of insulin handling and preparation involve a complex process that must follow strict step-by-step instructions. During this process, it is necessary to store insulin correctly and choose individualized materials for each patient. This includes hand hygiene, inspection of the application site, rotation of application sites, separation of the material to be used, homogenization and asepsis of the vial containing the medication, aspiration and injection of air in the corresponding dose of insulin followed by aspiration of insulin, removal of air bubbles, and finally application. In addition, it is recommended that when two types of insulin need to be prepared in the same syringe, the first to be aspirated should be the dose of regular insulin (BANCA, et al, 2022; ANDERS, et al, 2016). According to Moreira et al (2018), in the evaluation of procedures not performed or performed incorrectly during the process of self- tion of insulin, the main errors were during hand washing, aspiration of air into the syringe and injection into the insulin vial, and disposal of sharps in an appropriate place. For effective and safe management of people with diabetes mellitus, in order to minimize adverse events that prevent metabolic control, a multidisciplinary approach is necessary, consisting of physicians, nurses, pharmacists, nutritionists, and other health professionals who provide care and are involved in the initial guidance of these patients. That said, the objective of this study was to assess the knowledge of physicians at the Central University Clinic (AUC) about insulin handling and administration.

METHODOLOGY

This is a quantitative, cross-sectional, methodological study approved by the Ethics and Research Committee of the Evangelical University of Goiás (CEP - UniEVANGÉLICA), with Ethical Review Certificate number 77132123.3.0000.5076. The total estimated population was 44 doctors from different specialties, who work at the Central University Outpatient Clinic (AUC) in patient care and teaching roles, with the sample defined by convenience. In order to answer the aforementioned objective, a printed questionnaire was applied to collect data on the level of education and experience of these professionals regarding the handling and application of insulin. The questionnaire was administered during consultation hours

to physicians who agreed to participate and signed the Free and Informed Consent Form (FICF). For data analysis, the quantitative results obtained were tabulated in relative frequency (%) and absolute frequency (n) in Microsoft Excel®, so that the frequencies between the correct and incorrect answers identified in the performance of the AUC physicians could then be compared.

RESULTS

A total of 39 questionnaires were completed in the study. Based on the responses analyzed, the number of correct answers in absolute frequency (n) and relative frequency (%) per period analyzed are described below (Table 01).

Table 01. Absolute (n) and Relative (%) Frequencies of Correct Answers to the Questionnaire

Item evaluated by the questionnaire	CORRECT	ERRORS
	n	n
Q1. Storage location	24	15 (38.4%)
Q2. Conduct for frozen insulin	25 (64.1%)	14 (35.9%)
Q3. Time between removal from refrigerator and application	16 (41.0)	23 (59.0)
Q4. Method of homogenizing NPH insulin	15	24 (61.5)
Q5. Aseptic handling of vials	30 (76.9)	9 (23.1)
Q6a. Use of aseptic technique at the application site	30 (76.9)	9 (23.1)
Q6b. Skin fold	33	6 (15.4)
Q6c. Needle insertion movement	1 (2.6)	38 (97.4)
Q6d. Speed of administration	3 (7.7%)	36 (92.3%)
Q6e. Needle retention time in tissue	33 (84.6)	6 (15.4)
Q6f. Method of needle removal	33 (84.6%)	6 (15.4)
Q6g. Conduct if bleeding occurs after injection	28	22 (28.2)
Q7a. Asepsis of NPH vials + Regular	22	17 (43.6)
Q7b. Method of aspirating NPH insulin	7 (17.9)	32 (82.1)
Q7c. Method of drawing up Regular insulin	7 (17.9)	32 (82.1)
Q7d. Order of aspiration of NPH + Regular	10 (25.6)	29 (74.4)
Q7e. Total NPH + Regular insulin	28 (71.8)	11
Q7f. Removal of needle from insulin vial	28 (71.8)	11 (28.2)
Q7g. Conduct in case of incorrect aspirated dose	28	11
Q8. Asepsis at the application site	38 (97.4)	1
Q9. Need to wait for 70% alcohol to dry	25 (64.1)	14
Q10. Method of performing the skin fold test	24 (61.5)	15
Q11. Repeated use of the same syringe and needle	26 (66.7)	13
Q12. Administration in areas with scars	37 (94.9)	2
Q13A. Application site on the arm	30	9
Q13B. Application site on the buttocks	26	13
Q13C. Application site on the thighs	30	9
Q13D. Application site on the abdomen	2	37

Source: The authors themselves (2024).

Doctors from different specialties participated in the study, which provided a comprehensive overview of the knowledge of these healthcare professionals regarding both the handling and administration of insulin. The analysis of the results mentioned above highlighted relevant patterns of errors. It was found that the highest error rate is intrinsically related to the insulin application technique, mainly in sub-items Q6c and Q6d, where the correct technique is to insert the needle with a single, quick, firm, and light movement and to administer the insulin continuously. In sub-items Q7b and Q7c, an error rate of 82.1% was found. The correct procedure would be to first draw up the NPH insulin and then the Regular insulin. Finally, there was a high error rate in sub-item Q13d (94.4%), referring to the application site in the buttocks (upper outer quadrant).

Furthermore, with regard to the highest rates of correct answers, it is important to highlight the excellent understanding of items Q8 and Q12, corresponding to the need to clean the site and the contraindication of application in areas with scars, wounds, and lipohypertrophy.

CONCLUSION

Given the results, this study revealed considerable deficiencies in knowledge about insulin handling and administration among different AUC physicians. Based on the results, it is important to mention gaps in the practical training of these physicians and the risk of providing incorrect guidance to patients regarding application techniques, in addition to the need to improve insulin management. Even so, a consolidated understanding of asepsis and contraindications for application in areas with lesions was noted.

These findings highlight the importance of reinforcing the theoretical and practical training of physicians in insulin therapy, emphasizing patient safety and treatment efficacy. Further studies with a broader scope are suggested to promote improvements in medical education and raise awareness of the importance of this topic in the healthcare setting.

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