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USE OF THE CONTINUOUS INSULIN INFUSION SYSTEM AND GLYCEMIC CONTROL IN CHILDREN, ADOLESCENTS AND YOUNG PEOPLE WITH TYPE 1 DIABETES MELLITUS

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ABSTRACT
Objective: To evaluate the impact of the use of the continuous insulin infusion system (SICI) on glycated hemoglobin (HbA1c) in children and young people with type 1 diabetes mellitus (DM)1. Method: The sample consisted of data from 402 consultations carried out from 2019 to 2023 at the Interdisciplinary Diabetes Center (CENID) of the University of Marília. Patients aged between 1 and 27 years were included in the study, 49.5% of whom were male and 50.5% female. Regarding the method of insulin administration, the patients were categorized into SICI and multiple doses of insulin (MDI). Glycemic control was assessed by HbA1c measurement and the values were categorized as adequate (<7%) and not adequate (≥ 7%). Results: In the sample, 30.3% used the SICI and 69.7% used the MDI. Between 2019 (27.8%) and 2023 (38.2%), an increase in the proportion of patients using SICI was observed. Regardless of the year, a significant association (p-value<0.001) was observed between SICI use and HbA1c values <7%. Among the patients using SICI, 32.8% had HbA1c <7%, while in the patients using MDI, only 14.6% had HbA1c values <7%. Conclusion: The use of SICI is an important tool in the treatment of DM1, as it contributes to the improvement of glycemic control assessed by HbA1c, and it is necessary to increase the number of patients using SICI in Brazil.

Keywords: Type 1 Diabetes Mellitus. Insulin. Insulin Infusion Systems. Public Health.

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INTRODUCTION

Insulin therapy is critical in the treatment of type 1 diabetes *mellitus* (T1D), an autoimmune condition in which the body destroys the beta cells in the pancreas that produce insulin. Without insulin, the body cannot use glucose efficiently, resulting in high blood sugar levels. Exogenous insulin administration, through subcutaneous injections or insulin pumps, is essential to regulate blood glucose and prevent acute and chronic complications of the disease. Insulin therapy is individually adjusted, taking into account factors such as diet, physical activity level, and glycemic response, in order to keep glucose levels within a healthy range and provide a better quality of life for patients. (SILVA JÚNIOR et al., 2022)

The continuous insulin infusion system (SICI) is known as the "Insulin Pump" and the Multiple Dose Insulin System (MDI) is known as the "Insulin Pen". Both are used for insulin administration, but they have different approaches to insulin administration in the treatment of DM1. SICI uses an insulin pump that continuously delivers small doses of rapid or ultra-rapid insulin throughout the day and night, mimicking the natural secretion of the pancreas and allowing precise adjustments in doses in response to variations in blood glucose, diet, and physical activity. In contrast, the MDI regimen involves giving several daily insulin injections, usually one or two doses of basal (long-acting) insulin to maintain stable insulin levels throughout the day, and bolus (fast-acting) insulin doses given before meals to control postprandial blood glucose spikes. Both methods aim to control blood glucose, but differ in flexibility, convenience, and complexity of management. (GALINDO et al., 2020)

The use of SICI offers several advantages over MDI for glycemic control in DM1. SICI provides more precise and adjustable insulin delivery, which results in better mimicry of physiological insulin secretion, which can lead to more stable glycemic control and reduced blood glucose variations. In addition, SICI can be integrated with continuous glucose monitoring (CGM) systems, allowing automatic adjustments in insulin delivery based on glucose levels in real-time. This combination can significantly reduce episodes of hypoglycemia and hyperglycemia, improve HbA1c, and offer greater flexibility and convenience in the daily management of diabetes, improving the quality of life of patients. (KARGES et al., 2017)

On the other hand, the lack of adequate glycemic control in children and young people with T1D can lead to a number of serious and potentially debilitating complications. Among the acute complications, diabetic ketoacidosis stands out, a dangerous condition

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caused by extreme insulin deficiency, which can result in coma and even death if not treated promptly. In the long term, persistent hyperglycemia can cause damage to blood vessels and nerves, leading to chronic complications such as diabetic retinopathy, diabetic nephropathy, and cardiovascular disease. In addition, poor glycemic control can affect growth and development, negatively impact school performance and quality of life, and increase the risk of early cardiovascular disease. These complications highlight the importance of close monitoring and proper management of type 1 diabetes from childhood (DONAGHUE et al., 2018) .

Despite the significant advantages of SICI in the management of DM1, access to this technology in Brazil faces several limitations. The high initial and maintenance costs of SICI devices, which include the insulin pump and the supplies necessary for its continuous operation, can be an impediment for many families and individuals. In addition, coverage by public health systems and private health plans is limited, which restricts access to a smaller portion of the population. Another challenge is the need for technical support and specialized training for the correct use of SICI, something that may not be widely available in all regions of the country, especially in rural and less developed areas. These financial, logistical and educational barriers hinder the democratization of the use of SICI, perpetuating inequality in the treatment of DM1 in Brazil. (NEVES et al., 2022)

These limitations contribute to the low proportion of patients using the SICI in Brazil. In our country, the Brazilian board that provides for therapeutic assistance and the incorporation of health technology within the scope of the Unified Health System (SUS) is carried out by the National Commission for the Incorporation of Technologies (CONITEC). In 2018, CONITEC recommended the non-preferential incorporation of SICI into the SUS for the treatment of patients with DM1. Thus, its use and indication in Brazil is reserved for special cases where there was therapeutic failure with the multiple dose insulin system (MDI). (CONITEC, 2018)

It is worth noting that in Brazil, information on the distribution of patients with DM1 who use the SICI is limited. Thus, studies that provide both estimates of the effect of the use of the SICI on disease control and the proportion of patients using this method of insulin administration can contribute to a better understanding of the epidemiological scenario of the care of patients with DM1 in Brazil. In view of this scenario, the objective of this study was to analyze the prevalence and impact of the use of different methods of

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insulin administration on glycemic control in children and adolescents with DM1 treated at an interdisciplinary diabetes outpatient clinic.

METHODOLOGY

STUDY DESIGN AND POPULATION

A cross-sectional observational study was carried out following the methodological recommendations of the STROBE guideline. (CUSCHIERI, 2019) The sample consisted of data from 402 consultations carried out from 2019 to 2023 at the Interdisciplinary Diabetes Center (CENID) of the University of Marília. The project was approved by the UNIMAR Research Ethics Committee (opinion: 3.606.397/2019). The study is in accordance with the principles contained in the World Medical Association's Declaration of Helsinki. The entire population of patients aged between 1 and 27 years who signed the Informed Consent Form and the Informed Consent Form were included, 49.5% of whom were male and 50.5% female.

STUDY VARIABLES

In addition to age and sex, anthropometric data (body mass and height), nutritional status by body mass index (BMI), bioimpedance fat percentage, physical activity level (PAL), time of diagnosis, insulin administration method (MAI), glycated hemoglobin (HbA1c), fasting glucose and lipid profile were obtained. The time of diagnosis was categorized as<13 months, 13 to 60 months, and >60 months. Regarding the method of insulin administration, the patients were categorized into SICI and MDI. Insulin sensitivity factor (FS) was calculated using the formulas proposed in the guidelines of the Brazilian Diabetes Society. (SILVA JÚNIOR et al., 2022)

Anthropometric measurements of body mass and height were used to calculate BMI and perform the Bioimpedance test. For patients aged up to 19 years, BMI was estimated by z-score and categorized as underweight, eutrophic, overweight and obese according to the recommendations of the World Health Organization. For patients over 18 years of age, BMI was calculated by the Quelet equation and categorized according to ABESO recommendations as underweight, eutrophic, overweight and obese. The fat percentage was estimated by the Bioimpedance method. (ONIS et al., 2007) (MUNDSTOCK et al., 2021)

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The level of physical activity (PAL) was determined by categorizing the time in minutes per week of physical exercise at moderate to vigorous intensity obtained by physical activity recall. Based on the time in minutes per week of moderate-intensity and vigorous physical exercise, the PAL was classified as: sedentary (zero minutes per week); little active (<150 minutes per week); active (150 to 300 minutes per week); and very active (>300 minutes per week). (BULL et al., 2020)

For the study, laboratory tests of fasting glucose, HbA1c, total cholesterol (TC), LDL-C, HDL-C and triacylglycerides (TG) were performed. Glycemic control was assessed by glycated hemoglobin (HbA1c%) by the high-performance liquid chromatography (HPLC) method. Fasting glucose was analyzed by the colorimetric enzymatic method and values <100 mg/dL were considered normal. HbA1c% values were categorized as adequate (<7%) and not adequate (≥ 7%). Total cholesterol, HDL-c and TG were analyzed by the colorimetric method. LDL-c was calculated using the (PITITTO et al., 2022) *Friedewald equation* (SIBAL et al., 2010) .

STATISTICAL ANALYSIS

Qualitative variables were described by the distribution of absolute (N) and relative (%) frequencies. The difference in the distribution of the proportion of the qualitative variables was analyzed using the chi-square test. The association between the qualitative variables was analyzed using the chi-square test. Quantitative variables were described as mean and 95% confidence interval (95%CI). The homogeneity of the variances was verified by the Levene test. To compare the means between patients with SICI and MDI, the Student's *t-test with* Welch*'s correction* was used for independent samples. For comparison, the level of significance adopted was 5%.

RESULTS

Table 1 presents the categorical variables that characterize the sample in relation to the period of data collection, the method of insulin administration, gender, age group, time of diagnosis, nutritional status, level of physical activity, and HbA1c categorization.

Table 1: Distribution of absolute (N) and relative (%) frequencies of the qualitative variables that characterize the sample.

Variables	Categories	N	%	p-value
Year of collection	2019	18	4.5	<0.001*
	2020	63	15.7	

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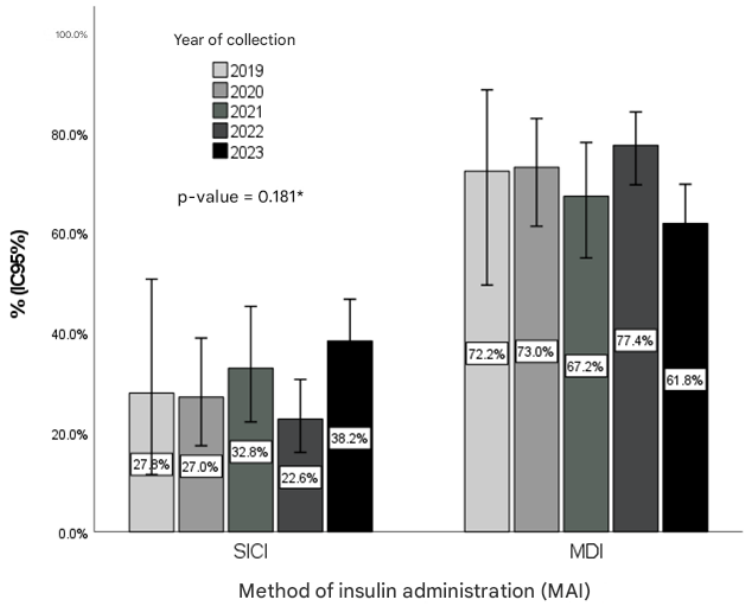
	2021	61	15.2	
	2022	124	30.8	
	2023	136	33.8	
Insulin Delivery Method (MAI)	SICI	122	30.3	<0.001*
	MDI	280	69.7	
Sex	Male	199	49.5	0.842
	Female	203	50.5	
Age group	<10 years	80	19.9	<0.001*
	10 to 19 years old	277	68.9	
	>19 years old	45	11.2	
Diagnostic Time	< 13 messes	57	14.2	<0.001*
	13 to 60 months	166	41.3	
	> 60 meses	179	44.5	
Nutritional Status (BMI)	Low weight	11	2.7	<0.001*
	Eutrophic	256	63.7	
	Overweight	115	28.6	
	Obese	20	5.0	
Physical activity level (PAL)	Sedentary	152	37.9	<0.001*
	Not very active	112	27.9	
	Active	74	18.5	
	Very active	63	15.7	
HbA1c	<7%	81	20.1	<0.001*
	≥7%	321	79.9	

Note: Note: * indicates a significant difference in the distribution of proportion between the categories by the Chi-square test for p-value ≤ 0.05. Continuous Insulin Infusion System (SICI). Multiple Doses of Insulin (MDI).

Figure 1 shows the distribution of the proportion (%) of patients using SICI and MDI by year of data collection. Figure 2 shows the distribution of the proportion (%) of the time ranges diagnosed within the groups using SICI and MDI use.

Figure 1: Distribution of relative frequency (%) and 95% confidence interval (95%CI) of the insulin administration method among patients seen by year of data collection.



Note: Continuous Insulin Infusion System (SICI). Multiple Doses of Insulin (MDI). * p-value calculated by the chi-square test for association.

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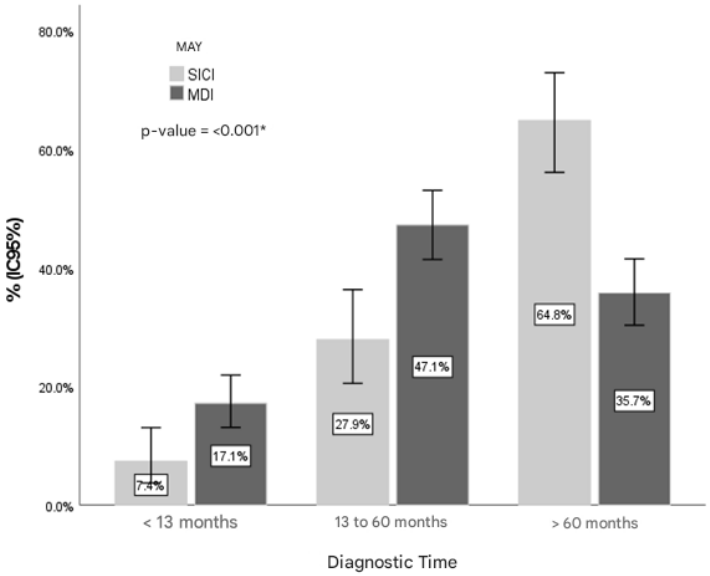
Figure 2: Distribution of relative frequency (%) and 95% confidence interval (95%CI) of the insulin administration method (MAI) in relation to the time of diagnosis of the patients attended.



Note: Continuous Insulin Infusion System (SICI). Multiple Doses of Insulin (MDI). * indicates a significant difference in the distribution of the proportion of the time since diagnosis in relation to the MAI by the Chi-square test of association for p-value ≤ 0.05.

Table 2 shows the distribution of sex proportion, age group, nutritional status, level of physical activity, and HbA1c categorization in relation to the method of insulin administration.

Table 2: Analysis of the frequency distribution of clinical variables and sample characteristics as a function of the insulin administration method (MAI).

Variable	Category	MAY				p-value
		SICI		MDI		
		N	%	N	%	
Sex	Male	51	41.8%	148	52.9%	0.042*
	Female	71	58.2%	132	47.1%	
Age group	<10 years	23	18.9%	57	20.4%	0.134
	10 to 19 years old	79	64.8%	198	70.7%	
	>19 years old	20	16.4%	25	8.9%	
Nutritional Status (BMI)	Low weight	2	1.6%	9	3.2%	0.032*
	Eutrophic	70	57.4%	186	66.4%	
	Overweight	42	34.4%	73	26.1%	
	Obese	8	6.6%	12	4.3%	
Physical activity level (PAL)	Sedentary	39	32.0%	113	40.5%	0.005*
	Not very active	30	24.6%	82	29.4%	
	Active	24	19.7%	50	17.9%	
	Very active	29	23.8%	34	12.2%	
HbA1c	<7%	40	32.8%	41	14.6%	<0.001*
	≥7%	82	67.2%	239	85.4%	

Note: Continuous Insulin Infusion System (SICI). Multiple Doses of Insulin (MDI). * indicates a significant difference in the distribution of proportion in relation to the MAI by the Chi-square test of association for p-value ≤ 0.05.

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Table 3 shows the comparison of the mean and 95% confidence interval of the variables age, fat percentage, HbA1c, glycemia, total cholesterol, triacylglycerides, LDL-c and HDL-c in relation to the method of insulin administration.

Table 3: Comparison of mean and 95% confidence interval (95%CI) for quantitative variables in relation to the method of insulin administration (MAI).

Variables	SICI (n=122)			MDI (n=280)			p-value
	Average	IC 95%		Average	IC 95%		
		READ	LS		READ	LS	
Age (years)	14.7	13.7	15.6	13.2	12.7	13.7	0.009*
% fat	24.4	22.8	26.0	22.9	22.0	23.7	0.108
HbA1c%	8.0	7.7	8.3	8.9	8.6	9.1	<0.001*
Glicemia (mg/dL)	163.2	155.6	170.7	193.9	185.5	202.3	<0.001*
Colesterol total (mg/dL)	165.8	161.5	170.1	166.5	162.5	170.6	0.807
Triacilglicerídeos (mg/dL)	84.0	77.8	90.3	86.7	81.5	92.0	0.510
LDL-colesterol (mg/dL)	93.8	90.1	97.5	94.7	91.5	98.0	0.700
HDL-colesterol (mg/dL)	54.5	52.0	57.0	54.3	52.8	55.8	0.902

Note: Continuous Insulin Infusion System (SICI). Multiple Doses of Insulin (MDI). * indicates a significant difference in the distribution of proportion in relation to the MAI by the Chi-square test of association for p-value ≤ 0.05.

DISCUSSION

In the sample, there was no significant difference in the distribution of proportion between the sexes. Only records of consultations with complete data were included in the study. In the data collection period, there was an increase in the number of queries with complete data. The lower number of consultations in 2019 to 2020 compared to 2022 and 2023 is due to the COVID-19 pandemic period and the gradual return of consultation routines. The largest proportion of the sample used MDI as a method of insulin administration (Table 1).

The largest proportion of the sample is aged between 10 and 19 years and has been diagnosed for more than 5 years (>60 months). Regarding the pattern of physical activity, the largest proportion of the sample is sedentary or not very active, and one third of the sample had an overweight nutritional status (overweight and obesity). In only 20.1% of the consultations did the patients have adequate glycemic control in relation to HbA1c (Table 1).

Although a higher proportion of Eutrophic (63.7%) was observed, overweight was observed in 28.6% and obesity in 5.0% of the sample. This distribution is similar to the findings of studies with pediatric and adolescent populations in which weight maintenance is crucial to avoid additional complications (Freitas and Souza, 2023). Overweight and obesity are considered an important cardiovascular risk factor, and an increased prevalence

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of obesity in patients with DM1 has been observed (OBOZA et al., 2023) . In a study in the American population, it was found that 22% were overweight and 14% obese. (REDONDO et al., 2016)

Among the factors that contribute to overweight and obesity, we can highlight a sedentary lifestyle. The high percentage of sedentary participants (37.9%) is concerning, considering that physical activity is an essential component in diabetes management. In addition, 27.9% showed little active physical activity behavior, which indicates insufficient behavior regarding activity recommendations. (ADOLFSSON et al., 2018) (TEICH; ZAHARIEVA; RIDDELL, 2019)

Although SICI was introduced in Brazil at the end of the 1970s, few patients use it and for its acquisition it is common to need legal proceedings. For this reason, the largest proportion of patients still use MDI as the primary method for insulin administration. In the present study, considering the entire collection period, 30.3% of the population studied uses the SICI. Although the smallest proportion of the sample uses SICI, the proportion using this method of insulin administration can be considered high for the Brazilian population, since it is believed that in Brazil the use of the insulin pump should not exceed 20% of patients with DM1. (ANDRADE et al., 2018)

In Brazil, the migration of the MDI system to SICI in patients with DM1 usually occurs when treatment with MDI fails to promote adequate control of the disease, especially regarding glycemic control. Therefore, in studies of the Brazilian population, it is common to observe the presence of complications of DM1 even in patients using SICI. This is partly due to the longer time of diagnosis and the time of exposure to inappropriate glycemic conditions. (FAGUNDES MELO et al., 2024)

The preferential use of the MDI method is justified by economic, accessibility, and infrastructure factors in the health system, as well as the complexity associated with the management of the continuous infusion system. SICI is significantly more expensive, both for acquisition and maintenance, which may limit its use in countries such as Brazil, where coverage by the public health system (SUS) is a necessity for many patients (CAZARIM et al., 2017) .

Regarding the proportion of patients using SICI as a method of insulin administration, no significant variation was found in relation to the years of collection (Figure 1). The variation in the proportion in the use of the SICI or MDI is influenced both by the entry of new patients, who start treatment with the MDI, and by patients with longer treatment time

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who adhere to the use of the SICI. In the sample, a higher proportion of diagnosis time greater than 5 years (60 months) was observed among patients using SICI (Figure 2), which increases the risk of complications associated with DM1. These results also reinforce the pattern of preference for the use of MDI as a method of insulin administration in the first years of diagnosis of the disease.

In the initial treatment context of T1D, the MDI regimen, which involves administering basal insulin and rapid insulin boluses before meals, is simpler and more familiar to many healthcare professionals and patients. This method allows adequate glycemic control, especially in newly diagnosed patients who are still adapting to the management of the disease (PERES et al., 2022). It is worth noting that both methods can be effective in the treatment of DM1, but SICI allows greater flexibility and precision in insulin administration adjustments.

Adapting to the use of the insulin pump requires training both the patient and the health team. The complexity of the continuous infusion system and the need for frequent adjustments make the method less accessible to populations with less access to specific training and ongoing technical support. The lack of infrastructure for training and ongoing support for patients using the insulin pump also makes it difficult to widely adopt this method, especially in remote or under-resourced areas. (GAJEWSKA et al., 2021)

It was found that among patients using SICI, a higher proportion of females and a higher proportion of overweight and obese patients (Table 2). Considering that the medical processes for acquiring the SICI via SUS are time-consuming and the success of the request depends on proving that the patient is not able to perform adequate glycemic control, it is natural that with the increase in the time of diagnosis, the risk of complications such as overweight and obesity increases. Thus, considering that in the sample patients using the SICI have a longer time of diagnosis, a greater chance of complications, such as overweight and obesity, is expected. (JEONG; KANG, 2022)

In addition, it was found that among the patients using SICI, there was a greater number of subjects with active and very active PAL (Table 2), which contributes to the reduction of complications of the disease, as well as to the prevention and treatment of overweight and obesity. Physical exercise has been widely recommended for people with DM1 due to its favorable effect on blood glucose control and on the reduction of complications, especially cardiovascular complications. Currently, exercise

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recommendations have been adjusted for patients using the SICI, which has stimulated a change in behavior in relation to physical activity. (ZAHARIEVA et al., 2023)

On the other hand, in patients using MDI, a higher proportion of sedentary and inactive patients was observed. The SICI offers greater flexibility in insulin adjustment, which can facilitate the practice of physical exercises, as it allows a more dynamic and precise control of insulin doses according to the need of the moment. On the other hand, in patients with MDI, a higher risk of hypoglycemia during exercise has been observed and this is considered an important barrier to change in physical activity behavior in T1D. (RIDDELL et al., 2023)

In the present study, regardless of the year of data collection and the time of diagnosis, a significant association (p-value<0.001) was observed between the use of SICI and HbA1c values <7%. Among the patients using SICI, it was found that 32.8% had HbA1c <7%, while in the patients using MDI only 14.6% had HbA1c values <7%. This indicates that the use of the SICI contributes to the improvement of the proportion of patients with adequate glycemic control in relation to HbA1c (Table 2).

Among adult patients with DM1, the use of the SICI system has been associated with improved glycemic control compared to patients using MDI. However, for acute complications such as hypoglycemia and ketoacidosis, no significant differences were observed. On the other hand, in patients with T1D of pediatric age, the use of SICI reduces the use of needles and allows the application of very small doses of insulin, which are physiologically more appropriate. In addition, the use of SICI in children is related to better glycemic control (ALMOGBEL, 2020) (AL-BELTAGI et al., 2022) .

In a study that evaluated the effect of the use of SICI in periods between 0.2 and 4 years, a significant reduction in HbA1c was observed, which was significantly lower than in patients using MDI. In addition, a significant reduction in the number of hypoglycemic events and a better perception of quality of life were verified, which contributes to the patient's self-care and reduction of long-term complications. (MCMAHON et al., 2005)

In another study, but a prospective longitudinal study, which compared the effect of MDI and SICI in adolescents and young people aged 10 to 20 years, no significant difference was found in the mean HbA1c. However, in the group using SICI, a lower proportion of patients with HbA1c equal to or less than 7.5% and a lower proportion of hypoglycemic events was observed. (RIBEIRO et al., 2016)

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In a randomized controlled clinical trial of children and adolescents aged 7 months to 15 years with a recent diagnosis of T1D, no significant differences were observed between the MDI and SICI treatment methods. Pointing out that both methods of insulin administration can be effective in the treatment of DM1 in patients diagnosed for up to one year. However, it is worth noting that other factors not explored in this study, such as diet, psychological and socioeconomic aspects, can influence glycemic control. (BLAIR et al., 2019) (ANDRADE; ALVES, 2019)

In the absence of definitive reversal therapy for T1D, achieving and maintaining recommended glycemic goals is crucial. Although enormous progress has been made in the last 30 years in terms of technologies for the treatment of DM1, many children and young people do not reach the recommended goals for glycemic control and demonstrate increasing prevalence of complications. (CARDONA-HERNANDEZ et al., 2023)

Table 3 compares the quantitative variables of age, fat percentage, lipid profile, glycemia, and HbA1c in relation to the MAI. There was no significant difference in age, fat percentage, and lipid profile between patients with and without SICI use. However, when considering the quantitative values of fasting glucose and HbA1, a significant difference was observed between patients using SICI and MDI. Regarding HbA1c, patients using MDI had values approximately 1% higher than patients using SICI.

Although mean HbA1c values greater than 7% in patients with SICI point to inadequate glycemic control, this result can still be considered relevant from a clinical point of view, because, due to the socioeconomic conditions and clinical characteristics of the population, predominantly children and adolescents, HbA1c values of up to 8% can be considered adequate given the difficulties in managing the disease in this population. (ELSAYED et al., 2023)

Although no association was found in the study between the use of SICI and lipid profile, there is a study that observed a positive effect of the use of SICI in relation to better LDL-c and non-HDL cholesterol. Changes in the lipid profile are an important complication and are related to increased cardiovascular risk. Increased HbA1c and lack of glycemic control is associated with increased risk of dyslipidemia in children and adolescents with T1D. Obesity, poor dietary behavior, and sedentary lifestyle are also related to increased risk of dyslipidemia. (KOSTERIA et al., 2019) (FAGUNDES MELO et al., 2024) (SELVARAJ et al., 2023)

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It is worth noting that people using technologies for the treatment of DM1 have been growing, but there are still great differences in access related to demographic, social and personal aspects. In addition, there is evidence indicating that the early adoption of insulin pump therapy in children and access to hybrid systems of automated closed-loop insulin delivery can further improve the control of the disease and its complications. In addition, applications for mobile devices are commonly used by the population and thus, the implementation of this tool to guide, prevent and monitor the health status of users becomes important, considering the effectiveness of these actions, already proven by the literature. (GANDHI et al., 2024) (ROCHA et al., 2024)

In clinical practice, the use of SICI has represented, in addition to improved glycemic control, an important effect on self-care behavior for food registration and adequacy, greater adherence to an active lifestyle, and better understanding of the disease. This is due to the need for a greater understanding of the disease in order to optimize the functioning of the SICI. However, educational support on the use of the SICI, both by the patient and by the professionals involved in the care, is necessary and, on the other hand, may represent a barrier to access and adherence to the use of the SICI (BERGET; MESSER; FORLENZA, 2019).

CONCLUSION

The use of SICI is an important tool in the treatment of DM1, as it contributes to the improvement of glycemic control evaluated by HbA1c and fasting glucose. However, only 30.3% of the sample studied uses the SICI, which was also related to better behavior regarding physical activity. These results reinforce the need for adjustments in public health policies that facilitate access to new technologies such as SICI for the treatment of DM1, especially in the population of children and adolescents. However, it is worth noting that the use of SICI does not exclude the need to develop the patient's self-care capacity, as well as the training of health professionals involved in care.

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