55 - TYPE 1 DIABETES MELLITUS AND PHYSICAL ACTIVITY IN THE SCHOOL ENVIRONMENT - A TWO-WAY PATH

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INTRODUCTION

Diabetes Mellitus is characterized as a chronic disease affecting increasing number of people in society, leading to significant impairment when it affects children - Diabetes Mellitus Type 1 (DM1). Due to its magnitude and complexity in the therapeutic actions and care, Diabetes Mellitus Type 1 is considered a public health problem. It requires changes in lifestyle that lead to an adjustment related to dietary restrictions, regular practice of physical activities, besides the prescription of drug treatment that consists of insulin therapy. It is a disease that has a high social cost. The DM1-affected child must achieve metabolic control in order to minimize and/or postpone the development of chronic complications.

According to Ruy and collaborators (2006), Diabetes Mellitus is considered a worldwide epidemic which ranks as a major challenge to health systems. It is a complex metabolic disease of multi-factorial nature and global presence that impinge on the quality and the life style of the DM1-patients and can lead to a reduction in life expectancy of the affected population.

To Miculis and collaborators (2010), despite the benefits of physical activity for the diabetic patient, many DM1-affected children still have a lower rank of sports or recreational practice than the recommended level. Such assumption is probably based on justifiable elements due to the frequent complaints from mothers or guardians and even from the DM1-affected children themselves regarding the restriction in participating in physical activity curricular classes in the school environment. In addition to that restriction, they also complain about the fact that those activities are only allowed in the presence of a family member in charge as long as the activity lasts. This is the regular procedure because there may occur a hypoglycemia event.

In the research carried out by Zanetti & Mendes (2008), with thirty children and mothers, one could observe in the data that nine mothers reported difficulties in school activities related to hindrances in their children's educational process caused by the disease. Such fact was reported as insecurity and fear that the child would go through a hypoglycemic episode during the school hours since the teachers are not prepared to deal with these occurrences. The authors have suggested further studies to expand this theme.

It is worth remarking that children usually remain in school for an average period of four to six hours, and this means that there is the need for an adjustment of routine and care of people with Diabetes Mellitus Type 1 during the hours they are in the school environment. However, the DM1-children are entitled to participate in all school activities, provided they have their glycemic rate monitored.

DM1-children need regular physical exercises because physical activities help balance their food intake and insulin and may also help lower blood glucose levels. Practicing physical exercises through organized sports can be especially beneficial because team sports help children feel integrated among colleagues.

Angelis, Purity & Flores (2005) have emphasized that regular physical exercise, insulin therapy and dietary planning are the basis of the approach to the treatment of Type 1 Diabetes Mellitus. Stemming from these data, this work introduces as its objective to characterize the difficulties faced by DM1-children related to the development of physical activity in the school environment and establish the importance of the physical education teacher related to interventions arising from the detection of hypoglycemia occurrences.

The method used was elaborated in the format of the reporting of experiments. It highlights the importance of teachers' knowledge about Diabetes Mellitus, especially true for the physical education teacher. This remark derived from the observation of a nursing consultation, held in the care center for DM1-children in a specialized hospital unit, located in the city of Rio de Janeiro. It was mainly characterized by what the mothers reported about their insecure feelings, not only among family members, but also among teachers regarding the inclusion of DM1-children in school activities, especially those involving physical activities.

PHYSICAL EDUCATION AND DIABETES

The metabolic lack of control may take the child with DM1 to a condition of severe complications, which, according to the guidelines of the Brazilian Diabetes Society (2013-2014), are the hyperglycemia that present signs and symptoms: severe thirst, dehydration, excessive volume of urine, fast weight loss, weakness, dizziness, abdominal pain and hypoglycemia characterized by the following signs and symptoms: pallor, difficulty concentrating, irritability, tremors, double or blurred vision, nausea, sweating, mental confusion, intense hunger, tachycardia and unexplained change of behavior. In cases when there is no possibility of running the capillary blood glucose test, clinical symptoms above are sufficient to confirm hypoglycemia and there must be immediate intervention.

Hypoglycemia is the most common acute complication caused by Type 1 Diabetes Mellitus. It is certainly a situation of great concern among parents and also teachers who stay several hours a day with children with DM1. According to the American Diabetes Association (2013-2014) hypoglycemia is characterized by blood glucose levels below 70 mg/dl. (Standard parameters - 70 mg/dl - 99mg/dl fasting – Brazilian Diabetes Society [SBD], 2007). Those levels of glucose usually occur because of overdose of insulin intake, food reduction, or still the increase in energy consumption, as it happens along physical activities. During physical education sessions, the teacher must determine whether the child with DM1 had a proper meal before performing the activity, so as to prevent the hypoglycemia symptoms.

According to Santana & Silva (2009), the Physical Education teacher should have a deep knowledge of the physiological mechanisms resulting from physical activity in the student's body, so that he is prepared to identify a hypoglycemia crisis, which is quite frequent. A hyperglycemia crisis during physical activities is less frequent, but the development of that condition is also important.

The school is a place where children usually play in the break between classes, practice sports activities and often fail to eat properly before that recreational time. Thus, it is an environment in which hypoglycemia crises are quite common because they use a lot of energy (glucose) without ingesting the amount necessary to maintain their metabolic balance. Consequently, the physical education teacher must be familiar with the hypoglycemia signs and establish a planned activity, including food intake before, after and sometimes during exercise the physical exercises practice. Those measures should be preceded by

assessment of capillary blood glucose. Therefore, all the care process converges to quick and appropriate intervention any time a hypoglycemia episode is detected.

Despite the risk of hypoglycemia, physical activities are recommended to children with DM1. According to Hoffman (2004), with an appropriate, insulin regimen and an individualized food intake plan, children with DM1 can experience the physical and psychosocial benefits promoted by exercises. This idea is also supported by Rodrigues (2006), who states that physical activities carried out in the school environment provide the DM1-child with the improvement of self-image and offer opportunities to participation in the treatment and the maintenance of desirable blood glucose levels.

As a suggestion to be applied to people with Diabetes follows the model of the questionnaire translated and adapted for the Brazil by Michels, Coral and Sakae (2010), called "Questionnaire of Activities of Self-care with Diabetes" (SDSCA/QAD). This has six dimensions and fifteen items of assessment of self-care in diabetes. To be evaluated with this questionnaire, the patients reported the frequency with which they performed physical activities and their behavior in the preceding seven days, indicating the performance achieved in your self-care.

ITENS DO SDSCA (ADAPTATION)

Diet (general)

1.1 How many of the last SEVEN DAYS have you followed a healthful eating plan?

1.2 On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?

Diet (specific)

2.1 On how many of the last SEVEN DAYS did you eat five or more servings of fruits and/or vegetables?

2.2 On how many of the last SEVEN DAYS did you eat high fat foods such as red meat or full-fat dairy products?

2.3 On how many of the last 7 days did your meals include sweets?

Exercise

3.1 On how many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking).

3.2 On how many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?

Blood sugar testing

4.1 On how many of the last SEVEN DAYS did you test your blood sugar?

4.2 On how many of the last SEVEN DAYS did you test your blood sugar the number of times recommended by your health care provider?

Foot care

5.1 On how many of the last SEVEN DAYS did you check your feet?

5.2 On how many of the last SEVEN DAYS did you inspect the inside of your shoes?

5.3 On how many of the last SEVEN DAYS did you dry between your toes after washing?

Medications

6.1 On how many of the last SEVEN DAYS, did you take your recommendeddiabetes medication? OR

6.2 On how many of the last SEVEN DAYS did you take your recommended insulin injections?

6.3 On how many of the last SEVEN DAYS did you take your recommended number of diabetes pills?

Smoking

Have you smoked a cigarette − even one puff − during the past SEVEN DAYS? 0. No; 1. Yes.

If yes, how many cigarettes did you smoke on an average day? Number of cigarettes: _____

When did you last smoke a cigarette?

– More than two years ago, or never smoked

– One to two years ago

– Four to twelve months ago

– One to three months ago

– Within the last month

– Today

FINAL CONSIDERATIONS

Planned physical activities, including food intake before, after and sometimes during exercises are directly related to the therapeutic response for children with Type 1 Diabetes Mellitus. However, despite the fact that the school environment represents a scenario that adds support favoring the glycemic control, it often fails to offer premises structurally prepared to receive DM1-children.

It is worth remarking that the effective action of the physical education professional is extremely important in order to establish circumstances that allow the full integration of these DM1-children, regard both their individual and group activities. In addition, the physical education professional action helps promote the improvement of self-image and offer opportunities to participation in the treatment and the maintenance of desirable blood glucose levels.

The focus of this work lies in aerobic exercises, i.e., those activities that can be maintained for a relatively long period of time, moving large muscle groups such as the muscles related to thighs, legs and arms. Exercises such as walking, running and swimming are also recommended. Thus, besides the improvement in the glucose use, they can reduce visceral fat found around organs such as heart, liver and kidneys.

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TYPE 1 DIABETES MELLITUS AND PHYSICAL ACTIVITY IN THE SCHOOL ENVIRONMENT - A TWO-WAY PATH

ABSTRACT

This study aims at developing some reflections on a worldwide epidemic and a major challenge to healthcare systems, i.e. Diabetes. It seeks to demonstrate gains for students with Diabetes Mellitus Type 1 derived from a regular practice of physical activities. Those gains would be detectable not only in the maintenance of blood glucose and lipid profile rates at desirable levels, but would also enable conditions for the accomplishment of some recommendations for the promotion of a healthy lifestyle in school. Moderate physical activities are aimed at reducing the risk of opportunistic infections in children with this diagnosis, and also at preventing other associated risk factors: sedentary life, obesity, and hypertension. Well planned exercises and a balanced diet favor the control of this chronic disease, and also increase the muscular glucose capacity, energy use, reduction of cholesterol and triglyceride rate levels, decrease in blood pressure and a feeling of well being and social inclusion. Previous studies carried out by Miculis and collaborators (2010) found out that many children with DM1 still keep a level of sports or recreational practice lower than recommended. In addition, many schools still practice restrictions against DM1 children's participation in physical activities at school, only allowing those practices in the presence of a parent or legal guardian.

KEYWORDS: Diabetes Mellitus Type 1. Physical Activities. Chronic Diseases Prevention.

LA DIABÈTE SUCRÉ (TYPE 1) ET L'ACTIVITÉ PHYSIQUE DANS LE MILIEU SCOLAIRE - UNE VOIE À DOUBLE SENS

RÉSUMÉ

Cette étude a pour but la réflexion sur une épidémie mondiale et l'un des principaux défis pour les systèmes de santé, c'est-à-dire le diabète. Par ailleurs il vise à présenter les bénéfits aux étudiants, qui ont le diabète de type 1, comme le côntrole de la glycémie et du profil lipidique à travers de la pratique de l'activité physique régulière, ainsi que des recommandations pour promouvoir une vie saine à l'école. Les activités physiques modérées mènent à réduire le risque d'infections opportunistes aux enfants avec ce diagnostic et à prévenir d'autres facteurs de risque associés: la sédentarité, l'obésité, l'hypertension. Des exercices physiques bien planifiés et une restauration allégée favorisent le contrôle de cette maladie chronique et augmentent la formation de glucose par le muscle, la dépense énergétique, l'abaissement du taux de cholestérol et de triglycérides, la diminution de la pression artérielle et un sentiment de bien-être et de l'inclusion sociale. Des études antérieures développés par Miculis et ses collaborateurs (2010) ont constaté que de nombreux enfants atteints de DT1 sont au dessous du niveau de la pratique sportive ou récréative prévu. En outre, il y a plusieurs écoles qui restreignent les activités physiques pour les enfants à l'école et les permettre seulement en face d'un parent responsable pendant le temps qu'elles ont lieu.

MOTS-CLÉS: Diabète sucré de type 1. Les activités physiques. Prévention des maladies chroniques.

LA DIABETES MELLITUS TIPO 1 Y LA ACTIVIDAD FÍSICA EN EL ENTORNO DE LA ESCUELA - UNA VIA DE DOBLE MANO

RESUMEN

El presente estudio es una reflexión sobre la epidemia mundial y uno de los principales retos para los Sistemas de Salud, es decir, la diabetes. Pretende demostrar beneficios para el estudiante, con la Diabetes Mellitus Tipo 1, a partir de una práctica regular de actividad física, tanto en el mantenimiento de los niveles de glucosa en la sangre, así como en el perfil lipídico, además de algunas recomendaciones para la promoción de una vida sana en la escuela. La actividad física moderada para reducir el riesgo de enfermedades oportunistas en los niños con este diagnóstico, así como evitar que otros factores de riesgo asociados: el sedentarismo, la obesidad, la hipertensión arterial. Ejercicios físicos como muy bien planificado y una dieta balanceada ayudan a controlar esta enfermedad crónica, además de aumentar la capacidad de la glucosa por músculo, el gasto de energía, la reducción del colesterol y los triglicéridos, la disminución de la presión arterial, y una sensación de bienestar y la inclusión social. Estudios previos realizados por Miculis y sus colegas (2010) encontró que muchos de los niños con DM1 siguen con el nivel de práctica deportiva o de recreo inferior a lo recomendado. Y muchas escuelas siguen limitadas a los niños para participar en la actividad física en el medio escolar, permitiendo sólo la a través de la presencia de algún responsable de la familia durante el tiempo de la ejecución de las mismas.

PALABRAS-CLAVE: Diabetes Mellitus Tipo 1. Las Actividades Físicas. Prevención de las Enfermedades Crónicas.

DIABETES MELLITUS TIPO 1 E ATIVIDADE FÍSICA NO AMBIENTE ESCOLAR – UMA VIA DE MÃO DUPLA

RESUMO

O estudo objetiva uma reflexão sobre uma epidemia mundial e um dos grandes desafios para os Sistemas de Saúde, ou seja, o Diabetes. Busca demonstrar ganhos para o aluno com Diabetes Mellitus Tipo 1, a partir de uma prática regular de atividade física, tanto na manutenção da glicemia, quanto no perfil lipídico, além de algumas recomendações para a promoção de uma vida saudável na escola. As atividades físicas moderadas visam reduzir riscos de doenças oportunistas em criança com este diagnóstico, bem como prevenir outros fatores de risco associados: sedentarismo, obesidade, hipertensão. Exercícios físicos bem planejados e uma dieta balanceada favorecem o controle desta Doença Crônica, além de aumentar a capacitação de glicose pelo músculo, o dispêndio energético, a redução do colesterol e triglicérides, a diminuição da Pressão Arterial e uma sensação de bem estar e de inclusão social. Estudos anteriores realizados por Miculis e colaboradores (2010) constataram que muitas crianças com DM1 ainda permanecem com o nível de prática esportiva ou recreativa menor do que o recomendado. E, muitas escolas ainda fazem restrição para que as crianças participem das atividades físicas no ambiente escolar, somente permitindo-a mediante a presença de algum responsável familiar durante o tempo da realização da mesma.

PALAVRAS-CHAVE: Diabete Mellitus Tipo 1. Atividades físicas. Prevenção de Doenças Crônicas.