Diabetes: influence of carbohydrates in the associated pathologies

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This article discuss about which the amount of carbohydrate ingested by the diabetic patient influences the pathologies that may be associated, since this is the nutrient that most affects the rate of blood sugar after a meal. By the fact that diabetes causes dysfunction and failure of various organs, this research aims the paper aims to identify the complications arising from it and analyze the influence of inappropriate ingestion of carbohydrate on blood glucose levels. In order to do such thing dietary survey was applied, "24-hour recalls," the older diabetic group PAIMI – Program of Integral Assistance to the Best Age, from Tiradentes University, however the outcomes were not consistent for a conclusion about the influence of carbohydrates associated with diabetes possibly due to the size of the sample. However, it remains evident that the lack of control of DM results in damage to the body and a high probability of developing complications. Although there is no permanent cure, a diet low in refined carbohydrates and high in soluble fiber, along with changes in the lifestyle, including the performance of physical activity are essential for both the treatment of diabetes, and prevention for those who possess risk factors but don't have the disease yet.

Keywords: Diabetes; carbohydrate; associated pathologies

Este artigo questiona como a quantidade de carboidrato ingerida pelo paciente diabético influencia nas patologias que venham a estar associadas, uma vez que esse nutriente é o que mais afeta a taxa de açúcar no sangue após a refeição. Pelo fato do diabetes provocar disfunção e falência de vários órgãos, a presente pesquisa teve como objetivo identificar as complicações dele decorrentes e analisar a influência da ingestão inadequada de carboidrato sobre os níveis de glicemia. Para tanto, foi aplicado inquérito alimentar, do tipo "Recordatório de 24 horas", a diabéticas do grupo PAIMI – Programa de Assistência Integral à Melhor Idade da Universidade Tiradentes, porém os dados encontrados não foram consistentes para a conclusão sobre a influência dos carboidratos no descontrole das patologias associadas ao diabetes possivelmente devido ao tamanho da amostra. Todavia, ficou evidenciado que o mau controle do DM resulta em prejuízo para o corpo e em uma grande probabilidade de desenvolver complicações. Embora não haja cura definitiva, uma alimentação com baixo teor de carboidratos refinados e rica em fibras solúveis, juntamente com mudança de estilo de vida, incluindo o desempenho de atividade física, são essenciais tanto para o tratamento dos diabéticos, como na prevenção para quem possui fatores de risco, mas ainda não é portador da doença.

Palavras-chave: Diabetes; carboidrato; patologias associadas

1. INTRODUCTION

This study focuses on diabetes mellitus (DM), a disease that affects the metabolism of carbohydrates, lipids and proteins, and its evolution causes dysfunction and failure of various organs, triggering sufferings of various kinds, disabilities and even death. For this reason the DM control is essential in the promotion of life quality for who carries this metabolic disorder. [1].

The appropriate treatment of the disease is extremely important, because diabetes can develop heart and cerebrovascular diseases, peripheral gangrene of lower limbs and also attack the vision and the kidneys of the individual. This way, glycemic control, the adaptations in lifestyle and changes in eating habits will soften the effects of the disease in the body health. [2].

Among the essential nutrients to the normal functioning of an organism, carbohydrate is the one that most affects blood glucose, be it as simple sugars (sucrose, fructose, lactose) and honey or as complex as starch (present in cereals and tubers). The sugars are quickly digested and

absorbed, and almost 100% of the total ingested is converted in glucose from 15 minutes to 2 hours after the ingestion. Therefore, the dosage of consumption of carbohydrate is one of the ways of controlling DM through food. [3].

Within this context, the question is: To what extent the amount of carbohydrate ingested by diabetic patients influences the pathologies that may be associated with one's illness? In this sense, this article aims to identify pathologies associated with diabetes and analyze the influence of carbohydrates on them. Currently, DM is a public health problem worldwide. Its incidence and prevalence are increasing significantly throughout the world. It was estimated that in Brazil in 2000 had approximately 5 million diabetics and that in 2010 and that this number would rise to 11 million. [3].

Besides the importance of the topic, the reason of this choice id due to the fact that some diabetics possess a good carbohydrate tolerance, depending on how it presents itself in digestion. The treatment of a diabetic is not just to prohibit the consumption of food, but to establish nutritional measurements that enhance blood glucose control and prevent chronic and acute, seeking for a good state of health. [3].

Diabetes mellitus (DM) is a chronic disease that affects the daily activities performed by its carriers. Therefore, it contributes to lower the self-esteem of the person who has diabetes, which affects life quality. Admitting diabetes and learn how to face it is the only way to get along with this disease and leading to a healthy life. [4].

Diabetes is related to the inability of the organism to use carbohydrate as an energy source, the solution found, before the discovery of insulin in 1921, was the removal of the carbohydrate in the patient's diet. Diabetics were treated with "starvation diets", and sometimes they used to die of starvation. Among the instructions for the diabetic patient, may be mentioned that in addition to accepting his sickness, he must be convinced that it is possible to have a normal life, starting from a proper dietary care and use of insulin or oral hypoglycemic agents, in cases where deemed necessary. [5].

Carbohydrate is the main nutrient that affects the rate of blood sugar after a meal, since 90 to 100% of it is converted to glucose 2 hours after being consumed, appearing in the bloodstream after 15 minutes. The same do not occur with proteins and fats, where 60% and 10%, respectively, are converted into glucose. [6].

The control of blood glucose is extremely important for reducing complications resulting from the diabetes, because the severity and chronicity of hyperglycemia are particularly associated with the appearance of secondary injuries [7]. A rigid control of DM in its early stage may delay the onset of various systemic complications, but should be considered that its patients have variability on the initiation of complications and its gravity and the organ or organs involved.

It is worth mentioning that the knowledge of the DM provides new possibilities to the patient to live better with the disease, that is, it takes the acquisition of healthier and accurate habits. For this reason, it is necessary that the diabetic is accompanied by a specialized team. Carriers of the diabetes often do not accept or overcome their limitations and new roles, caused by the illness because they do not how to face it. [8].

The treatment of DM involves at least a meal plan, physical activity as well as drugs in some cases. It is extremely important to be monitored by a multidisciplinary team of health because it tends to prevent and /or delay the chronic complications that can occur during disease progression [9]. In order to the person live with disease is necessary that changes take place in their daily lives and in their values and is stating that any treatment or care is considered as an attempt to cure, regardless of perspectives [10].

Some patients may require insulin to treat the disease. Most often the carrier of DM type 1 depend on exogenous insulin supplementation for survival and can develop serious complications such as those mentioned above, and even lead to a coma. As for patients with type 2 priority is to detect the disease, the adoption of strategies in their lifestyle, such as controlling carbohydrate intake, the limit of saturated fat ingested, increasing physical activity and others things, so that there is an improvement in their metabolic abnormalities [11].

The DM treatment aims to prevent excessive postprandial hyperglycemia, hypoglycemia when the patient is making use of insulin or an oral agent, achieving and maintaining ideal body

weight, making the serum cholesterol and triglyceride levels returned to normal levels, as well as prevent and delay the vascular disease of small and large vessels [6]. The diabetic should try various treatment modalities, until find the one that more suitable, in terms of their physical well-being and in relation to interference in their daily treatment [11].

When implemented a treatment for a patient with diabetes that will enable you to obtain positive results, it is necessary to be equipped with knowledge, skill and technique necessary for their self-care. The patient should be prepared to make adjustments in their daily lives in order to an improved control their glucose levels, prevention of chronic complications and enhancing the their quality of life [12].

2. MATERIALS E METHODS

We conducted field research with members of the group Paim - Program of Integral Assistance to the best age of Tiradentes University. It develops activities in education, seeking a cultural improvement, moral, spiritual and intellectual. Were observed in everyday life: lectures on social issues; exhibition of films /documentaries, followed by discussion, cultural visits, singing classes, competitions, festivals, entertainment and recreation activities, hiking, vaccination, in crochet work, embroidery, paintings and crafts, with display of works in the mini shopping, and group dynamics.

In this transversal research, descriptive, with quantitative approach in study of companionship group, the sampling plan was based on the register of all members of Paim. The study population consists of 48 women whose age range from 57 to 81 years, among which 9 are diabetic.

Through a quantitative method of evaluation of food ingested, ”24-hour recalls," was verified the food intake of diabetic participants in the research. This method generally allows the evaluation of the survey for the previous day. Each patient was asked about all foods and beverages consumed in the last 24 hours, it is important to record the type, quantities, preparation of food and beverages consumed at every meal or out of them, as well as the times they were made. Therefore, this method allowed measuring the amount of carbohydrate ingested by the PAIM elderly with diabetes mellitus [13]. It was considered that some of the elderly may be affected by other diseases, which may be associated with DM and thus accomplished the study of impact of this macronutrient in the same clinical condition.

The carriers of the disease, after being informed about the research procedure, authorized its development, which occurred through the signing of a Free and Informed Consent, as well as they respond to a food survey, like “24-hour recalls”. The data were fully transcribed, grouped and analyzed regarding the quality of the diet of the diabetic people, which allowed the evaluation of the amount of carbohydrates ingested by them.

3. RESULTS AND DISCUSSION

From the grouping of the information contained in the "24-hour recall" from 9 (18.75%) diabetics belonging to the diabetic group Paim, it was found that they maintain a high consumption / day of carbohydrates, especially the simple ones, and vitamins. In contrast, maintain a low consumption / day of protein and fiber. There were no reports of daily intake of lipids and complications associated with diabetes.

The finding of high consumption / day of carbohydrates for those with diabetes is alarming, since it affects glycemic control and may harm the good health of the elderly. Controlling blood sugar level, trying to maintain the rate of glucose close to normal, has the function to promote the relief of symptoms and improvement in quality of life. Since, for this we need at least a meal plan, which should include habits to be followed for life, which must also be adopted not only by those who have the disease, but for all the family.

Is undeniable the importance of family support with regard to treatment of diabetes because studies show that this is one of the reasons given as justification for non-compliance [10]. The family support is an ally in the introduction of appropriate health advice

received and the process of coping with the DM. The educational process of the diabetic person should value experience and background knowledge, based on these values and beliefs of both the patient himself, as well as the patient's household [9]. For the encouragement of adherence to treatment and self-care, which are of great importance, increase the chance of success is essential to consider it a human being in a holistic way because it interferes in the way it captures the information, learns and begins to take care [4].

Given the results obtained, the preference for consumption of simple carbohydrates, which are sugars (glucose, sucrose, fructose and galactose) is leading the intake above the amount indicated by the nutritionist. It is recommended to replace the complex for the simple carbohydrates, which are cereals, flours, tubers and vegetables, since they are digested more slowly by the body and contain fiber. It is worth emphasizing the importance of fiber content in foods, because these plant polysaccharides interfere with the absorption of cholesterol and glucose during digestion, causing postprandial less accentuated.

Carriers of type 2 diabetes may benefit from taking diet rich in soluble fiber, as they positively affect the metabolism of carbohydrates and lipids. Since the beta-glucan present in high amounts in oat bran and barley, promote the increase in viscosity of the food bolus, causing a reduction in peak postprandial glucose and a decrease in the amount of LDL cholesterol in the blood. Regarding the role of these dietary fibers in patients with type 1 diabetes there is need for further studies[14].

Carbohydrate is the nutrient that most affects blood glucose levels, however, fiber, fat and proteins in food can interfere making the absorption of nutrients slower, reason why should be taken into account the type of carbohydrate that is ingested[3]. Despite the high consumption of carbohydrates, none of the nine diabetics reported symptoms that may be associated with DM. Consider that this disease originates as a result of various causes, leading to various kinds of suffering and its repercussions on the development of worsening clinical complications already mentioned as well as being responsible for the high rate of hospitalizations and the need for special medical care, hence the need for their control [15].

For all the above, it is clear the interference of inadequate intake of carbohydrates on blood glucose levels, which may reflect the lack of control of diabetes and consequently the risk of development of complications. However, the results from the application of food to carry the survey group Paim, were not consistent in order to complete or not the influence of the carbohydrates in diseases associated with DM, since it is a very small sample, representing only 9 people (18.75%). There is a need to conduct research involving a larger number of diabetics so that the results be meaningful.

4. CONCLUSION

Several studies have shown that most diabetics have poor eating habits and are sedentary, resulting in damage to health and high probability of developing complications. For this reason, the work is relevant for diabetes educators as they pass information about the disease, so that the person monitor their own health consciously.

The patients with this pathology require constant care, which must also be applied for the whole family, by way of support in fighting the disease. In people who have well controlled blood glucose levels, diabetes complications are much less common and severe. The diet to be prescribed for the diabetic patient should be qualitative, and has a nutritional variety and quantity due to the quantity of calories that can be consumed within the recommendations.

A diet low in refined carbohydrates and high in soluble fiber, along with lifestyle changes, including the performance of physical activity are essential both for the treatment of diabetes, and prevention for those with risk factors, but still does not carry the disease. Thus, given the abundant evidence that a balanced diet, adjusted to the individual patient, enables the carrier an active life, it is essential that all health care staff, not just the nutritionist, have knowledge about the nutritional recommendations.

1. CZEPIELEWSKI, M. A. *Diabetes* – ABC da Saúde. Disponível em: <http:/www.abcdasaude.com.br/artigo.php?127>. Acesso em: 11 maio 2010.
2. SILVA, D. G. V. S. da et al. Pessoas com Diabetes Mellitus: suas escolhas de cuidados e tratamentos. *Revista Brasileira de Enfermagem*, Brasília, v. 59, n. 3, maio/jun. 2006.
3. CUPPARI, Lilian. *Nutrição: nas doenças crônicas não-transmissíveis*. São Paulo: Manole, 2009.
4. XAVIER, A. T. F.; BITTAR, D. B.; ATAÍDE, M. B. C. Crenças no autocuidado em diabetes – implicações para a prática. Texto & Contexto – Enfermagem, Florianópolis, v. 18, n. 1, jan./mar. 2009.
5. MITCHELL, H. S. et al. *Nutrição*. 16. ed. Rio de Janeiro: Interamericana, 1978.
6. HISSA, A. S. R.; ALBUQUERQUE, L. L.; HISSA, M. N. Avaliação do grau de satisfação da contagem de carboidratos em diabetes mellitus tipo 1. *Arquivos Brasileiros de Endocrinologia & Metabologia*, São Paulo, v. 48, n. 3, jun. 2004. Disponível em: <www.scielo.br/pdf/abem/v48n3/a11v48n3.pdf>. Acesso em: 11 maio 2011.
7. RUBIN, E.; FARBER J. L. *Patologia*. Rio de Janeiro: Interlivros, 1990.
8. COELHO, M. S.; SILVA, D. M. G. V.; PADILHA, M. I. S. Representações sociais do pé diabético para pessoas com diabetes mellitus tipo 2. *Revista da Escola de Enfermagem da USP*, São Paulo, v. 43, n. 1, mar. 2009. Disponível em: <www.scielo.br/pdf/reeusp/v4n1/08.pdf>. Acesso: 11 maio 2011.
9. ZANETTI, M. L. et al. O cuidado à pessoa diabética e as repercussões na família. *Revista Brasileira de Enfermagem*, Brasília, v. 61, n. 2, mar./abr. 2008.
10. SILVA, D. G. V. S. da et al. Pessoas com Diabetes Mellitus: suas escolhas de cuidados e tratamentos. *Revista Brasileira de Enfermagem*, Brasília, v. 59, n. 3, maio/jun. 2006.
11. MAHAN, L. K.; ESCOTT-STUMP, S. *Alimentos, nutrição & Dietoterapia*. São Paulo: Rocca, 2005.
12. LEITE, S. A. O. et al. Pontos básicos de um programa de educação ao paciente com diabetes melito tipo 1. *Arquivos Brasileiras de Endocrinologia & Metabologia*, São Paulo, v. 52, n. 2, mar. 2008.
13. DUARTE, A. C. G. *Avaliação Nutricional*: aspectos clínicos e laboratoriais. São Paulo: Atheneu, 2007.
14. MIRA, G. S.; GRAF, H.; CÂNDIDO, L. M. B. Visão retrospectiva em fibras alimentares com ênfase em beta-glucanas no tratamento do diabetes. *Brazilian Journal of Pharmaceutical*, São Paulo, v. 45, n. 1, jan./mar. 2009.
15. SARTORELLI, D. S.; FRANCO, L. J. Tendências do diabetes mellitus no Brasil: o papel da transição nutricional. *Cadernos de Saúde Pública*, Rio de Janeiro, v. 19, 2003. Disponível em: <www.scielo.br/pdf/csp/v19s1/a04v19s1.pdf>. Acesso: 11 maio 2011.