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Risk Assessment of Type 2 Diabetes Mellitus Depending on The Degree of Activity of Rheumatoid Arthrits

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Abstract
Objective: to assess the risk of developing type 2 diabetes mellitus using the FINDRISC questionnaire in individuals with rheumatoid arthritis, depending on the degree of disease activity.
Materials and Methods: The study included 75 people: 55 (73.3%) women and 20 (26,6%) men aged 18 to 60 years with rheumatoid arthritis. The ten-year risk of developing diabetes was assessed using the FINDRISK scale (Finnish Type 2 Diabetes Risk Assessment Form). All respondents were divided into three groups depending on the level of rheumatoid arthritis activity according to the Desease activity index 28-ESR scale (DAS28-ESR). Statistical processing of the material was carried out using the IBM using the Kruskal-Wallace, Mann-Whitney, and Spearman coefficients.
Results and discussion: in the frequency structure of risk factors for the development of type 2 diabetes, abdominal obesity (73.5%) and overweight (62%) prevailed. Important differences between the comparison groups were found according of eating vegetables .A direct correlation was found between the degree of activity of rheumatoid arthritis and the risk of developing diabetes mellitus according to the FINDRISC scale
Conclusion: a high degree of activity of rheumatoid arthritis increases the risk of developing type 2 diabetes in the next decade of life. The use of the FINDRISK questionnaire can serve as an effective tool for assessing the risk of type 2 diabetes in individuals with rheumatoid arthritis.

Keywords: rheumatoid arthritis, FINDRISK, type 2 diabetes mellitus.

Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune disease that leads to early disability and disability. The increase in overall mortality in RA is mainly associated with an increase in cardiovascular diseases, which account for more than 50% of premature deaths in this group of patients .

One of the important predictors of the development of cardiovascular pathology is diabetes mellitus (DM). There is evidence of an increase in the risk of developing type 2 diabetes mellitus with RA compared with the general population .

It is known that type 2 diabetes mellitus may not manifest itself symptomatically for many years, however, early detection of impaired glucose tolerance reduces the risk of developing cardiovascular complications. In this regard, the recommendations on diabetes, pre-diabetes and cardiovascular diseases EASD / ESC (2014) established methods for the early detection of type 2 diabetes, which include: 1) measurement of plasma glucose or glycosylated hemoglobin (HbA1c); 2) clinical and demographic examination 3) the use of questionnaires to identify risk factors for the development of type 2 diabetes . Despite the fact that the latter method does not allow determining the current state of glycemia, it is preferable for the general population and reduces the number of individuals who need a biochemical examination. (FINDRISC) is most often used to identify risk factors for increasing DM, which allows estimating the 10-year risk of type 2 DM, including asymptomatic DM and impaired glucose tolerance. It has shown that in persons with a high degree of RA activity, diabetes mellitus occurs more frequently than in persons with low disease activity. Studies on the assessment of the risk of developing type 2 DM depending on the degree of RA activity have not been found in the available literature.

The aim of the work is to assess the risk of developing type 2 diabetes mellitus using the FINDRISC questionnaire in individuals with rheumatoid arthritis, depending on the degree of disease activity.

MATERIALS AND METHODS

The exclusion criteria were the presence of diabetes mellitus, mental illness, pregnancy. Examination of patients included the measurement of anthropometric data according to standard methods (height, weight, waist circumference), measurement of blood pressure (BP), calculation of body mass index (BMI). The respondents were divided into three groups depending on the level of RA activity according to the Desease activity index 28-ESR scale (DAS28-ESR): 1 group with low activity (DAS28-ESR 2.6-3.2 points) , group 2 - with medium activity (DAS28-ESR 3.2-5.0) -, group 3 - with a high degree of RA activity (DAS28-ESR ≥5.1) - . The median duration of the disease was Me=3.6 (Q25-751.2-10) years.

The decade risk of developing diabetes mellitus was assessed using the FINDRISC scale, which consists of 8 items, including age, BMI, waist circumference, 30 minutes of daily physical activity, daily consumption of vegetables, regular intake of antihypertensive drugs, an indication in the anamnesis of the detection of elevated blood glucose and the presence of diabetes in relatives. The risk of developing diabetes was assessed depending on the total score: below 7 points - low risk , 7-11 points -

slightly increased risk, 12-14 points - moderate risk will 20 points - high risk ,more than 20 points - very high risk .

RESULTS AND DISCUSSION

The prevalence of the components of the FINDRISC questionnaire was analyzed depending on the degree of RA activity according to DAS 28-ESR .

According to the obtained data, the median age did not differ among the studied groups and ranged from 53 to 55 years (group 1 Me=53 ,group 2 Me=55; group 3 Me=55)

Among all factors of the 10-year risk of developing type 2 diabetes mellitus in patients with RA, such factors as abdominal obesity (74.5%), overweight and constitutional obesity (61.%), and arterial hypertension prevailed (hypertension) (51.5%), insufficient consumption of vegetables (50%) and low physical activity (46.2%). Despite the fact that persons with abdominal obesity and overweight were more common in the group of moderate and high degree of activity, no statistically significant differences were found depending on the degree of RA activity. The high frequency of detection of abdominal obesity and overweight in RA is reported in the works of other authors.A number of studies have shown a relationship between the presence of obesity and the development of RA, emphasizing the fact of revealing a lower percentage of remission in the presence of obesity in individuals with rheumatoid arthritis. It is believed that the pathogenetic relationship between RA and obesity is the production of pro-inflammatory cytokines by metabolically active adipose tissue and the maintenance of chronic inflammation, while autoimmune processes stimulate the expressionbiologically active components of adipose tissue. Thus, a certain “vicious circle” is formed, in which one link supports the development and progression of the other. Data have been obtained that clinically significant weight loss in individuals with rheumatoid arthritis leads to a reduction in the time to achieve remission ,, which justifies the need to introduce measures aimed at weight loss in the complex treatment tactics of managing patients with RA to reduce disease activity and improve response to therapy.

The results of the study showed that half of the patients with rheumatoid arthritis have insufficient consumption of vegetables, which has significant differences between the compared groups .Individuals with medium and high RA activity ate fewer vegetables than those with low activity, respectively. Sufficient vegetable intake is of particular importance for patients with RA, as daily vegetable intake has been shown to reduce the risk of developing RA, changing eating habits in accordance with the recommendations of the Mediterranean diet (eating a large amount of vegetables, polyunsaturated fatty acids, vegetable oils) leads to a decrease in pain and the number of painful joints in people with RA.The antioxidant effect of the compounds contained in vegetables and their inhibitory effect on pro-inflammatory cytokines are assumed.

As the results of the study showed, all patients with RA had a low level of FA. There were no significant differences depending on the degree of RA activity .Low physical activity in patients with RA has been reported inbots and other authors. It should be noted that the level of physical activity in individuals with RA does not significantly differ from FA in the general population. Major barriers to increasing FA in individuals with RA . It is noteworthy that joint pain did not take a leading position, giving way to factors such as general fatigue and lack of time, similar to barriers in individuals without a history of rheumatoid arthritis, indicating that physical inactivity remains a problem in the population. - niya in general and persons with RA including. Thus, there is evidence that aerobic and strength training, including high-intensity training, significantly improved the functional abilities of patients with rheumatoid arthritis, without increasing joint damage according to the results of magnetic resonance imaging.

There were no differences between groups in the frequency of risk factors such as regular use of antihypertensive drugs, a history of elevated blood glucose, and the presence of diabetes in relatives. The frequency of detection of these risk factors was comparable with the data obtained by other authors.

RA activity penalty according to DAS28-ESR showed a trend towards an increase in the proportion of persons with a high risk of developing type 2 diabetes in patients with moderate and high RA activity, which was confirmed by correlation analysis , which indicates the effect of rheumatoid arthritis activity on the risk of developing type 2 diabetes. This is apparently due to the fact that chronic inflammation maintains high concentrations of pro-inflammatory cytokines that affect insulin resistance in this category of patients. Thus, it has been shown that tumor necrosis factor (TNF) can bind to the insulin receptor (Glut4) in adipocytes and skeletal muscle cells .The use of the FINDRISC questionnaire among patients with RA made it possible to identify individuals with a high risk of developing type 2 diabetes, who need a more in-depth examination aimed at diagnosing diabetes. The high prevalence of traditional risk factors for the development of type 2 diabetes the development and implementation of effective preventive measures aimed at combating risk factors for the development of type 2 diabetes in patients with RA.

CONCLUSIONS

1. In the frequency structure of risk factors for the development of type 2 diabetes in patients with RA, abdominal obesity (74.5%), overweight (61.9%), and low physical activity (46.2%) prevailed; insufficient consumption of vegetables (50%) and hypertension (51.5%); consumption of vegetables differed significantly depending on the degree of RA activity (p=0.017).
2. The ten-year risk of developing type 2 diabetes increases in individuals with high activity of rheumatoid arthritis (rs=0.372; p=0.00).

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