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EARLY DIAGNOSIS OF DIABETIC NEUROPATHY IN CHILDREN

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Summary
Early signs of diagnosis of diabetic neuropathy in children and adolescents have been studied.

Abstract
The article studied the early diagnosis of clinical and paraclinical manifestations of diabetic polyneuropathy in children by studying the parameters of neurotrophic factors. Indicators of neurotrophic factors depend on the duration and course of the disease, which are an early marker for the diagnosis of axonopathy disorders.

Keywords: children, diabetes, polyneuropathy, diabetic polyneuropathy, diagnostics.

Introduction

The study of diabetes, especially in childhood, is very relevant, since the pathogenesis of morbidity and diagnostic criteria, especially the absence of diagnostic markers in the early stages of complications, are not fully disclosed (2, 4). With late diagnosis, the disease progressing from peripheral complications leads to the development of disability. Modern medicine requires the search for genetic markers and neuroimmunological indicators to help identify a group of children and adolescents at risk for the development of diabetic neuropathy, prevention and therapy in the early stages of the disease (5, 8, 4). Many authors have found that neurotrophic factor contributes to the strengthening of myelin by Schwann cells for the protection and support of the peripheral nervous system. Deficiency in the level of neurotrophic factor contributes to the deterioration and progression of peripheral nerve damage in diabetes mellitus.

The purpose of the work: To study the signs of early diagnosis of diabetic neuropathy in children and adolescents.

Materials and Methods

To study the signs of early diagnosis of diabetic neuropathy in children and adolescents. Material and research methods. Our study involved adolescent children aged 8-18 years with diabetes mellitus. The control group consisted of 15 practically healthy children of the same age. The study also included 20 children with polyradiculoneuritis of inflammatory origin. Out of 100 children with diabetes mellitus, patients with sensorimotor polyneuropathy were sorted out - 42, of which patients with a subclinical form - 19 and 23 clinical forms of the disease were identified. Scientific work was carried out on the basis of the regional endocrinological center of Samarkand and on the basis of the 1st clinic of the Sammu Medical University of the Department of Pediatric Neurology for the period 2020-2022. Research was carried out without fail only after the permission of the parents and the attending physician of the child. All participants underwent a standard clinical and neurological examination, from the instrumental methods of studying ENMG, the functional scales TSS (general scale of neurological symptoms, modified according to the age of patients, if necessary) and the NDS scale (neuropathic dysfunctional score) were also studied. From laboratory analyzes, ciliary and cerebral neurotrophic factors were determined. Using standard Student's criteria, statistical data were processed on an individual computer.

Research Results

We have studied in both groups neurotrophic factors such as ciliary (CF) and cerebral (BF). CF (ciliary) factor in OG ~21.0 pg/ml, in CG ~10.9 pg/ml, but in children with PVH it corresponded to ~19.5 pg/ml, where p=0. 001.At the same time, brain-derived neurotrophic factor (BF) was ~9578 pg/mL in OG SMP, 6233 μg/mL in CG, and the most interesting thing is that in children with PVG they were changed and corresponded to ~9379 pg/mL, which in significance is p=0 .0001.

When analyzing neurotrophic factors in OH, depending on the type of DM, it turned out that in children with DIP with type 2 DM, the factor was significantly higher. So, in DIP with SMP with type 1 diabetes, BF is on average 9052 pg/ml, and type 2 is on average 9574 pg/ml, where p = 0.001. At the same time, in the subclinical stage, on average, the BF figures were within 8778 pg/ml, and in the clinical stage 9400 pg/ml, where p=0.0001.

As for changes in the brain neurotrophic factor depending on the duration of the disease, for more than 10 years there has been a slight decline to a decrease and is equal to 9393 pg/ml, most likely this fact is associated with adaptation to the disease over a fairly long period. But what cannot be said about the ciliary neurotrophic factor, where CF reacts to a long period of the disease with an increase in indicators, by 10%, which

had an average limit of 30.9 pg/ml, p=0.0001. Since the level of glycated hemoglobin depends on the form of the disease, in patients where the duration of the disease did not exceed 10 years, an increase in the level of brain-derived neurotrophic factor up to 9680 pg/ml was naturally observed, and when the course of the disease was ≥10 years (12-15 years), there was a decrease in BF values to 9250 was noted. At the same time, the level of ciliary neurotrophic was statistically consistently high in patients with a 5–10 year old disease. Depending on the form of the disease, the level of indicators of factors changed, the following indicators were found, in the subclinical form, the concentrations of BF ~ 9570 and CF ~ 25.8 pg / ml were detected, the data obtained suggest the likelihood of an early reaction of the Schwann cell factor in response to the initial stage of axonopathy, which manifest themselves for regeneration of peripheral nerve disorders. The reaction of the brain-derived neurotrophic factor to the level of high glycated hemoglobin, which had a direct correlation with blood sugar and BF, was also revealed; while ciliary neurotrophic factor is elevated even at relatively stable levels of glycated hemoglobin, HbA1 and CF, R=-0.26, p=0.04.

In subclinical forms of the disease in patients, the electroneuromyography parameters were not changed, a change was noted only in the CF side. The CF indicator can be considered a test for predicting and determining the complications of diabetes in children and adolescents at an early stage.

In patients with OH older than 15 years, with a long course of the disease, a high BF = 9895 pg / ml, and low numbers of CF = 19.9 pg / ml were characteristic.A correlation was found between the duration of the disease and with an instrumental change on ENMG, a very low M-response rate was found, <0.55 mV, and according to CRV, <39 m/s, which gives half the difference between the norm. This means that there is a progression and a demininizing process.

Identified correlation analysis indicating elevated BF and no change in ENMG, the level of brain-derived neurotrophic factor can serve as an early marker for diabetic sensorimotor polyneuropathy. The level of ciliary neurotrophic factor in comparison with ENMG indicators in the subclinical stage is the basis for conducting these analyzes in DIP with DM for the diagnosis of early forms of sensorimotor polyneuropathies. In order to determine the development of the severity in the clinical stage, a curve of change in ciliary neurotrophic was compiled as an indicator of the prognosis. Since the lower the CF, the worse the indicator of clinical signs of diabetic polyneuropathy, in such cases, the ciliary neurotrophic factor should not exceed 6 pg / ml. in correlation analysis with ENMG, which is considered indicative in the clinical stage. In order to obtain an even more complete model of the interaction of neurotrophic factors with the results of other indicators, depending on the form of the

disease, the decision was to make a connection with testing by scales. The results of the correlation analysis on the TSS scale (general scale of neurological symptoms), where the indicators were in the range from 3.5 to 7.5 points (average 5.5), with indicators of the neurotrophic factor, in the subclinical form of SMP, the relationship according to the degree of prognosis , that is, in the absence of the ability to use laboratory tests, with the same success, indicators on scales can serve as an effective prognosis in making a diagnosis. But only in the aggregate study of indicators of several scales, for example, the use of the NDS scale (neuropathic dysfunctional score), which showed the reliability of sensorimotor disorders from the severity of the disease and was in the range from 10 to 14 points. The severity of diabetic polyneuropathy on the NDS scale had statistically significant correlations with neurotrophic factors, which can also be used as one of the evidence in this category of patients.The only weak link in assessing the reliability of the results obtained is the age of children, where the patient cannot always correctly and clearly assess the level of damage, respectively, questionnaires on scales, and an electroneuromyographic examination cannot be final in making a diagnosis, its form and severity, thus the laboratory nature of recognition is the most indicative.

Conclusions

Correlation analysis with electroneuromyography parameters at the subclinical stage indicates elevated BF values and no change in ENMG values, that is, the level of brain-derived neurotrophic factor can serve as an early marker for diabetic sensorimotor polyneuropathy. The severity of diabetic polyneuropathy on the NDS scale had statistically significant correlations with neurotrophic factors, which can also be used as one of the evidence in this category of patients.

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