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TO EVALUATION OF THE EFFECT OF OPPORTUNISTIC DISEASES ON CARBOHYDRATE AND LIPID METABOLISM IN PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS

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ABSTRACT
In recent years, type 2 diabetes mellitus has been growing rapidly and is rapidly spreading among the younger strata of the population. This is manifested by an increase in the number of cases of its occurrence with other diseases, including infection with the human immunodeficiency virus (HIV). In this regard, our study assessed the importance of opportunist infections in the development of type 2 diabetes mellitus in HIV -infected patients.
KEY WORDS: ***diabetes mellitus, opportunist infection, glycemia.***

INTRODUCTION

Currently, the incidence of diabetes mellitus type 2 and human immunodeficiency virus infection is growing rapidly. This is the impetus for the increase in the number of appeals from patients with 2 diseases to doctors in practice. Metabolic disorders in human immunodeficiency virus infection have often been evaluated as the effect of antiretroviral therapy. The development of opportunist infections in HIV -infected patients is directly related to the state of immunaturity in the body, the fall of the immune system leads to a head-on bacterial, viral, fungal and parasitic diseases. Opportunist infection means that in a normal immune state, microorganisms that live unharmed without saprophytes in the body are understood, and in a state of immunaturity, their pathologically developed reproduction is understood. These include candidiasis, simple herpes virus, cytomegalovirus infection, toxoplasmosis, tuberculosis infections. However, in our work, we have reaped metabolic disorders according to the type of opportunist infection.

OBJECTIVE OF THE STUDY

To evaluate carbohydrate and lipid metabolism disorders according to the status of opportunist infections in HIV-infected patients.

MATERIALS AND METHODS OF STUDY

The patients with HIV infection taken into the study were divided into groups according to antiretroviral intake (1group) and non-response (2 groups). In the 1st group, 115 patients aged 18 years to 65 years who received antiretroviral drugs, of which 56 (48.6%) were women, 59 (51.3%)were men, their average age was 47.5±1.55 in women, and 46.1±1.85 in men. In 2 groups, 39 patients who did not receive antiretroviral drugs were taken and their average age was 40,8±1.47, of which 18 were women, men were 21. Since opportunist infections do not come alone in most cases in HIV-infected patients, we have summarized and grouped them into the most common combination. According to the most common combinations of opportunistic infections in HIV-infected patients, conditionally divided into 4 groups: 1 group had a nonspecific fever, oropharyngeal candidiasis, angular heylitis and recurrent infection of the respiratory tract, the number of patients was 57individual, of which women 26 people, men 31 people. In our 2 group of patients, diagnosis of unknown diarrhea, HIV- cachexia, oropharyngial candidiasis and angular heylitis was observed, and the patients were 40 people. Of these, women became 21,men equal to 19. In 3 group of patients, pulmonary tuberculosis, nonspecific fever and generalized lymphadenopathies were observed, the number of patients was equal to 16, of which 7 were women, and 9 were men. In 4 group of patients, diagnosis of unknown Genesis fever, undetectable causative diarrhea, HIV-cachexia and oropharyngial candidiasis was observed, and the patients included 35 people, of whom 17 were women and 18people were men.

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Table 1
Clinical Description of Patients by Groups

Indicators	1-group		2-group		3-group		4-group	
	ARVT+ n=51	ARVT- n=12	ARVT+ n=36	ARVT-- n=10	ARVT+ n=4	ARVT-- n=9	ARVT+ n=25	ARVT-n=8
Gender:woman	28 / 54,9±7,0	6 / 50,0±15,1	15 / 41,7±8,3	6 / 60,0±16,3	3 / 75,0±25,0	5 / 55,6±17,6	15 / 60,0±10,0	1 / 12,5±12,5*^&
man	23 / 45,1±7,0	6 / 50,0±15,1	21 / 58,3±8,3	4 /40,0±16,3	1 / 25,0±25,0	4 / 44,4±17,6	10 / 40,0±10,0	7 / 87,5±12,5*^&
Age	45,3±1,1	44,1±2,7	44,2±1,2	38,8±2,3	48,5±2,8	41,6±2,4	41,7±1,6&	37,6±2,2*
Duration of HIV	10,2±0,57	8,5±0,46	10,2±0,69	8,6±0,48	10,8±0,61	7,2±0,42*^	10,1±0,58	10,9±0,62**^&&&
ARVT Duration of	7,5±0,49	-	6,3±0,43*	-	7,8±0,52^	-	6,2±0,35*&	-
Body weight index	24,7±0,58	25,2±0,76	23,7±0,69	23,3±1,2	25,7±1,4	24,6±1,3	24,8±0,88	25,2±1,7
Waist circumference	97,9±1,7	101,6±2,2	96,8±2,3	81,7±4,4**	106,5±6,3	101,4±4,9^	92,7±2,7&	72,1±3,0***^&&&
Hip circumference	99,3±1,6	99,8±2,9	99,9±2,0	83,3±3,2**	94,8±5,7	106,4±2,2*^^^	98,0±2,2	78,8±3,7***&&&
Abdominal index	0,99±0,02	1,02±0,029	0,98±0,027	0,98±0,024	1,16±0,07^	0,95±0,032	0,95±0,024&	0,92±0,012*^*
CD4+	272,6±21,6	185,2±12,4	287,2±15,2	243,9±14,3**	280,3±14,7	148,1±8,4*^^^	372,8±21,8**^^&&	212,5±12,5&&&
Viral installation	84894,2±44003,9	433029,3±358023,2	327638,9±282889,3	290875,1±275998,2	2725,5±1835,6*	106515,0±90722,3	34782,2±25396,3	187641,9±116514,1

Note: * - 1-groupreliable differentiation in relation to indicators (*-P<0,05; **-P<0,01; ***-P<0,001)
^ - 2-groupreliable differentiation in relation to indicators (^-P<0,05; ^^-P<0,01; ^^^P<0,001)
& - 3- groupreliable differentiation in relation to indicators (&-P<0,05; &&-P<0,01; &&&P<0,001)

When these patients were analyzed,patients who did not receive antiretroviral therapy in the 2-and 4-group (respectively 38,8±2,3; 37,6±2,2; P<0,05) in terms of age were reliably different from patients in the 1-and 3-group. Patients who did not receive antiretroviral therapy in the 4th group showed a reliable higher outcome than H IV duration from other groups. And according to the duration of art, a convincing minimum result was recorded in 2-and 4-groups. There was no reliable difference between the groups by body weight index. But the indicators of the abdominal index were equal to reliable high scores in patients who did not receive antiretroviral therapy in the 1st group, and in patients who received antiretroviral therapy in the 3rd group. When the highest CD4 index among art drinkers was found in the 4th group (372,8±21,8) (P<0,01), the minimum number of CD4 lymphocytes among patients not receiving antiretroviral therapy was found in the 3rd group (P<0,001). Viral loading constituted a reliable low rate in all other groups of patients in the 3rd group (P<0,05). As can be seen from the above indicators, in the group of patients with the longest duration of art, the indicator of the abdominal index shows the highest result, and these changes make a more in-depth study. In these groups, the indicators of carbohydrate metabolism were studied and the effect of combinations of patients opportunist infections on carbohydrate metabolism and insulin resistance was assessed in the table below (table 2).

Table 2
Evaluation of carbohydrate metabolism and insulin resistance indicators in combination with opportunist infections

Indicators	1- group		2- group		3- group		4- group	
	ARVT+ n=51	ARVT- n=12	ARVT+ n=36	ARVT-- n=10	ARVT+ n=4	ARVT-- n=9	ARVT+ n=25	ARVT- n=8
Given time glycemia	5,6±0,19	5,7±0,19	5,5±0,19	5,9±0,29	6,7±0,54*^	5,9±0,31	5,1±0,21*	5,8±0,21
Insulin	17,9±0,64	18,2±1,0	17,5±0,66	18,9±1,2	17,8±2,0	19,5±1,1	19,6±1,2	19,8±1,2
HOMA	4,5±0,23	4,6±0,28	4,3±0,23	4,9±0,45	5,3±0,73	5,1±0,32	4,5±0,36	5,2±0,42
glycated haemoglobin	6,7±0,22	6,7±0,39	6,1±0,17*	6,3±0,40	6,1±0,66	6,4±0,21	6,3±0,24	7,2±0,24^&

Note: * - 1-group reliable differentiation in relation to indicators (*-P<0,05)
^ - 2-group reliable differentiation in relation to indicators (^-P<0,05)
& - 3-group reliable differentiation in relation to indicators (&-P<0,05)

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Indicators glikemia was reliably differentiated in 3-group art-receiving patients compared to 1-and 2-group (P<0.05). And the 4 group indicators recorded a reliable low result compared to the 1 group (P<0,05). There was no convincing change in groups between insulin levels. The indicators of the Homa index were not equal to the between groups reliable result, but the insulin of the Homa index was determined from the normative indicators. The amount of glycated haemoglobin is equal to a convincing difference compared to other groups in patients who do not receive 4-th group of art, and this is evidenced by the fact that the glycemic changes of these patients have different variability throughout the day.

In addition to carbohydrate metabolism and insulin resistance status in the groups of patients under study, we also studied lipid metabolism disorders and found that they were reflected in the table below (table 3).

Table 3
Evaluation of lipid metabolism indicators in combination with opportunist infections

Indicators	1- group		2- group		3- group		4- group	
	ARVT+ n=51	ARVT- n=12	ARVT+ n=36	ARVT--n=10	ARVT+ n=4	ARVT--n=9	ARVT+ n=25	ARVT- n=8
Common cholesterin, mmol/l	5,5±0,14	6,3±0,32	5,3±0,17	5,6±0,22	4,8±0,21*^	5,4±0,25*	5,0±0,20*	6,3±0,31&
Triglycerid, mmol/l	1,85±0,11	3,50±0,31	2,09±0,18	3,08±0,17	1,76±0,07	3,03±0,16	1,81±0,14	3,21±0,30
hig -density lipoprotein, mmol/l	2,14±0,07	1,03±0,034	1,94±0,12	0,94±0,054	1,94±0,09*	1,03±0,04	2,03±0,10	1,02±0,05
Low-density lipoprotein, mmol/l	2,50±0,14	3,66±0,30	2,42±0,16	3,30±0,19	2,06±0,10*^	3,0±0,15*	2,19±0,21	3,81±0,31&
Very low density lipoprotein, mmol/L	0,84±0,05	1,59±0,14	0,95±0,083	1,4±0,08	0,80±0,03	1,38±0,06	0,82±0,06	1,46±0,14
Index atherogenesis	4,5±0,14	5,1±0,28	4,3±0,17	5,2±0,39	3,8±0,18**^	4,3±0,21*^	4,0±0,20*	5,2±0,41&

Note: * - 1-group reliable differentiation in relation to indicators (*-P<0,05; **-P<0,01; ***-P<0,001)
^ - 2-group reliable differentiation in relation to indicators (^-P<0,05; ^^-P<0,01; ^^^-P<0,001)
& - 3-group reliable differentiation in relation to indicators (&-P<0,05; &&-P<0,01; &&&-P<0,001)

Table 3 shows that all indicators were equal to the greatest reliable result in patients who did not receive antiretroviral therapy. When studied among the groups, the amount of common cholesterin was reliably different in 3-4 groups compared to 1 group. There is a reliable difference in the amount of triglycerides by groups. The amount of hig density lipoprotein in the 3-th group was lower than in the 1 group. The amount of low density lipoproteinwas reliably low in Group 3 compared to group 1 and 2, even among patients who did not drink art showed a lower result than group 3 compared to group 1, among those who did not drink low density lipoprotein art was the highest in group 4 representatives. There was no sharp difference between the indicators of very low density lipoprotein in the gut. The indicators of the atherogenicity index were also reliably different from the results of the 3 - and 4-group of patients, the results of the 1-2-group.

A word about the evaluation of opportunist infections as a risk factors for diabetes mellitus type 2 go it is important to say that these infections can disrupt metabolism. This, in turn, is proved by the fact that abdominal obesity is called stronger in a group that does not accept art. The presence of insulin resistance in patients of all groups, a reliable increase in glycated hemoglobin in 4-th group of patients, a more pronounced disruption of lipid metabolism among patients without art indicates that the percentage of the effect of this infection is not small.

CONCLUSION

1. Abdominal index values were found to be significantly higher in patients receiving antiretroviral therapy (1.16 ± 0.07; 0.95 ± 0.03; P <0.05) than in patients not receiving antiretroviral therapy.
2. Given time-glycemia was equivalent to a reliable high value in patients receiving 3-group antiretroviral therapy, while glycated hemoglobin was recorded as a reliable result in patients not receiving 4-group antiretroviral therapy.
3. Increases in total cholesterol (6.3 ± 0.31; P <0.05) and low-density lipoproteins (3.81 ± 0.31; P <0.05) showed a reliable difference in patients not receiving group 4 antiretroviral therapy .

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