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Prolactin concentration in the serum of male patients with chronic hepatitis C

In liver diseases the differences in hormones serum concentrations are due to pathological changes in their metabolism and degradation, as well as neuroendocrine disturbances caused by the immunological response. The mutual communication between the neuroendocrine system and the immunological system is made possible by receptors of peptide hormones present on immune cells.

Prolactin is one of peptide hormones produced by the pituitary gland. It actively takes part in regulating gonads function. Studies concerning the serum concentration of prolactin during the course of acute hepatitis and cirrhosis of different etiology are not specific (4, 12).

The aim of this work was to investigate whether and to what extent the chronic hepatitis C has an impact on prolactin serum concentrations in men.

MATERIAL

Fifty-two men were included in the study: 26 of them being the control group of healthy men and the other 26 being a group of patients with chronic hepatitis C. The control group consisted of 26 healthy blood donors aged 21 to 37 years. In these men all laboratory results were within normal limits. In order to eliminate the influence of age on prolactin serum concentration we chose the control group in such a way that each of the examined patients had his age-appropriate healthy individual. The examined group consisted of patients aged 21 to 37 years, hospitalised with chronic hepatitis C at the Department of Infectious Diseases of the Medical University of Lublin.

The diagnosis of chronic hepatitis C was based on the presence of HCV-RNA and anti-HCV antibodies in the serum, the histological examination of liver and biochemical results. In order to exclude infection with HAV and HBV, the single serum investigations of anti-HAV IgM antibodies, anti-HBc IgM antibodies and HBsAntigen were done. The prolactin concentration was determined in the serum of patients twice i.e.: on the 2nd day of hospitalisation (investigation I) and after 4 weeks of hospitalisation (investigation II).

None of the examined men was diagnosed with any co-existing disease. Nor were infection markers of HAV and HBV found. The studied men did not undergo any pharmacological treatment, either before the diagnosis of the disease or during the course of examinations. Standard serum investigations: the bilirubin level, total protein level, ALAT, AST and alkaline phosphatase (AP) activities were done at the same time as the hormone concentration investigations.

Twenty-six patients underwent the liver biopsy during which the Menghini method and one-use Hepafix sets were used. No complications were observed. The histological examinations were done at the Department of Pathology of the Medical University of Lublin.

Each examined person was informed about the aim of the research and gave his written consent to the study.

METHODS

The blood for examinations was obtained from ulnar veins from to 7.30-8.00 a.m. with patients being on an empty stomach. It was collected in glass tubes for centrifugation. Some of the obtained serum was used for biochemical analysis, the rest was kept in plastic tubes, type Eppendorf, from the company Medlab, in the temperature of -200^0C, until the radioimmunological assay (RIA) examinations were done, but no longer than 4 months. We examined in the serum: the total bilirubin level with the use of prepared sets of reagents "Bili-T" (Bio Merieux, France); the total protein level with the use of prepared sets of reagents "Proteines-Kit" (Bio Merieux, France); ALAT and ASPAT activities with the use of prepared sets of reagents "Enzyline ALAT/GTP 50 monoreactif" (Bio Merieux, France) and "Enzyline ASAT/GOT 50 monoreactif" (Bio Merieux, France); alkaline phosphatase activity with the use of prepared sets of reagents "Enzyline PAL optimise" (Bio Merieux, France); HCV-RNA with RT-PCR method and with the use of prepared diagnostic sets "Digene Sharp Signal System" (Murex Diagnostics); anti-HCV antibodies with immunoenzymatic (EIA) method and with the use of prepared sets of reagents UBI HCV EIA (Organon Teknika, the Netherlands).

The determination of HAV and HBV markers was done with the use of commercial tests of the 3rd generation, with immunoenzymatic method (EIA) and sets from the Abbot Company.

The kept serums were defrosen all at the same time and used for determination of serum prolactin levels. This was done with radioimmunological method (RIA) with the use of prepared set of reagents RIA-PROL-CTK-4 (Sorin Biomedica, Italy).

STATISTICAL ANALYSIS OF RESULTS

The results were statistically analysed (3, 7). The analysis was made in 26 ill patients who had examinations done twice during their hospitalisation time (investigations I and II). The control group of 26 healthy men was also statistically analysed.

The levels of the studied attributes were characterised by the range of values (min-max), the arithmetical mean (M), the standard deviation (SD), standard variation (S2) and the variation coefficient (V%). The statistical difference between the obtained values in both patients and control group was calculated with the appropriate Student-Neuman-Keuls test or c-Cochran and Cox test.

RESULTS

Results of prolactin concentrations in the serum of patients and control group are presented in Table 1. The concentration in the control group showed to be in the range of 3.0 – 7.0 ng/ml, with the mean value 5.25±1.456 ng/ml. In the group of patients with

Table 1. Prolactin concentration (PRL) in serum of male patients with chronic hepatitis C

Group	Investigation	n	PRL ng /ml					V %	Compared to the control group		
			min	max	M	S^2	SD		difference in mean values	c	p
Control	-	26	3.0	7.0	5.25	2.12	1.456	28.30	-	-	-
Patients	I	26	3.0	11.0	6.8	5.387	2.321	34.86	1.55	2.816	$p < 0.01$
	II	26	3.0	11.2	6.7	6.786	2.605	33.90	1.45	2.429	$p < 0.01$

min – minimal value, max – maximal value, M – arithmetical mean, S^2 – variation, SD – standard deviation, V% – variation coefficient, c – value calculated with c-Cochran and Cox test, p – level of statistical importance

chronic hepatitis C the serum prolactin concentration in investigation I was in the range of 3.0–11.0 ng/ml, with the mean value of 6.8±2.321 ng/ml. In investigation II the observed values were 3.0–11.2 ng/ml, with the mean being 6.7±2.605 ng/ml.

We observed statistically important difference in serum prolactin concentrations in patients, both in investigation I and II, and the results of prolactin concentrations in the control group. In both investigations the levels were statistically higher, compared to the ones in the control group.

An increase in prolactin concentrations in investigation I compared to the results from the control group was 1.55 on the average and this is statistically important ($p<0.01$). It was a similar thing in investigation II where the difference in values in patients and the control group was +1.45 ($p<0.01$). The difference in mean values in both investigations was insignificant (+0.1 ng/ml). Variation coefficients in both investigations were of similar value. They were 35%, 34% and 28%, for investigation I, II and the control group, respectively.

Comparing the concentration values of prolactin in the serum of male patients with chronic hepatitis C with the normal range calculated for the group of healthy men, we observed elevated levels of prolactin in 42% of patients in relation to maximal values in healthy men. We did not observe lower values than the values in the control group. Each investigation was done for 26 individuals.

DISCUSSION

In our work we analysed the dynamics of prolactin serum concentration in male patients with chronic hepatitis C. The diagnosis of the disease was confirmed by the presence of HCV-RNA in the serum and by the histological examination of the liver. We did not observe icterus or hypoproteinaemia in the studied group. An elevated serum activity of aminotrasferases, ALAT and ASPAT, was continuously present during the period of 4--week hospitalisation. The histological examinations of the liver proved a little inflammatory activity with a medium degree of fibrosis in most of the analysed samples of patients with chronic hepatitis C. In addition, fatty degeneration of the liver was seen in samples of two men with chronic hepatitis C. During histological examinations of the inflammation activity there were no destruction, cholangitis or venulitis traits observed. Those factors are known to contribute largely to liver fibrosis. Having the results of prolactin serum concentrations in male patients with chronic hepatitis C analysed, it is important to point to the statistically important increase of this hormone concentration compared to its concentration in the group of healthy men. The prolactin concentration is characterised by its big lability, which is influenced by various both exogenous and endogenous factors (11). For instance, estrogens stimulate the synthesis and the release of prolactin, whereas the progesterone represses its secretion (2, 6, 10). There is some information in the literature concerning prolactin serum concentration changes in acute hepatitis. Statis-

tically high concentrations of prolactin have been showed in women with acute infection with HBV. They have the tendency to decrease during the convalescence period (9). In another paper it was showed that the serum prolactin concentration increased in male patients with both acute hepatitis B and A, with values being statistically higher during the course of acute B infection (1). Different results were obtained by some other authors who proved low levels of serum prolactin concentration in women and men during the 1st week of hepatitis B, which had a tendency to return to normal ranges during the period of restoration to health (5). Many authors agree that during the chronic hepatic diseases, especially the liver cirrhosis, hyperprolactynaemia is observed. It might be caused by disordered metabolism of estrogens or concentration changes of neuromediators in the central-spinal fluid and serum (4, 5, 13). Some interesting research results concerning prolactin serum concentration in men were communicated in blood donors with anti-HCV antibodies in their serum. However, the liver disease was not diagnosed exactly during the course of HCV infection. The authors of the mentioned work prove a higher prolactin concentration in men with the O, A and AB blood groups in contrast to men with the B blood group (8). Wang et al. did not notice statistical difference in secretion of testosterone, estradiol and prolactin in liver cirrhosis in men in relation to the etiology of the disease (12).

The presented investigation results of one of pituitary gland hormones, prolactin, studied in the serum of male patients with chronic hepatitis C give us a better insight into its concentration changes in chronic liver diseases. It would be interesting to carry on further research in order to find out to what extent acute liver inflammation and cirrhosis C influence hormones serum concentrations.

CONCLUSIONS

An analysis of the dynamics of prolactin serum concentration in male patients with chronic hepatitis C shows a statistically important increase in this hormone serum concentration compared to the control group.

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SUMMARY

In this work we analysed the dynamics of prolactin serum concentration in male patients with chronic hepatitis C. A group of 52 men were included in the study, 26 of them constituted the control group. The diagnosis of the disease was confirmed by the presence of HCV-RNA in the serum and by the histological examination of the liver. None of the examined men was diagnosed with any co-existing disease nor any infection markers of HAV and HBV were found. The prolactin concentration was determined in the serum of patients twice: on the 2nd day of hospitalisation and after 4 weeks of hospitalisation by the use of radioimmunological method (RIA) applying a prepared set of reagents RIA-

PROL-CTK-4 (Sorin Biomedica, Italy). The results were statistically analysed. An analysis of the dynamics of prolactin serum concentration in male patients with chronic hepatitis C shows a statistically important increase in this hormone serum concentration.

Stężenie prolaktyny w surowicy krwi mężczyzn chorych na przewlekłe wirusowe zapalenie wątroby typu C

W pracy analizie poddano dynamikę stężenia prolaktyny w surowicy krwi mężczyzn chorych na przewlekłe wirusowe zapalenie wątroby typu C. Badaniami objęto 52 mężczyzn, w tym 26 osób stanowiło grupę kontrolną. Rozpoznanie choroby potwierdzono obecnym w surowicy krwi materiałem genetycznym wirusa C i badaniem histopatologicznym wątroby. Nie stwierdzono chorób współistniejących jak również markerów zakażenia HAV i HBV. Stężenia prolaktyny w surowicy krwi chorych oznaczano dwukrotnie: w drugim dniu hospitalizacji i po upływie 4 tygodni hospitalizacji metodą radioimmunologiczną (RIA) przy użyciu gotowego zestawu odczynników RIA-PROL-CTK-4 (Sorin Biomedica, Włochy). Uzyskane wyniki badań poddano analizie statystycznej. Stwierdzono istotny statystycznie wzrost stężenia prolaktyny w surowicy krwi mężczyzn chorych na przewlekłe wirusowe zapalenie wątroby typu C.