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Research Article

Peroxidation of Biologic Membranes' Lipids in Patients with Viral Hepatitis C and Chronic Kidneys Diseases

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ABSTRACT

Research objective was studying of indicators of perekisny oxidation of lipids of biological membranes and accumulation of toxic substances in biological liquids of an organism at patients with a chronic viral hepatitis C against the background of chronic illness of kidneys. Under observation there were 3 groups of patients: 25 people with a chronic viral hepatitis C, 23 patients with chronic hepatitis C + chronic a glomerulonephritis and 13 people with chronic hepatitis C and the 5th (terminal) stage of chronic illness of the kidneys which are on a hemodialysis. The control group of healthy was made by 30 people comparable to the examined patients on gender and age. Extent of activation of perekisny oxidation of lipids was estimated by means of determination of content of a low-new dialdehyde in a blood plasma, for assessment of antioxidatic protection determined the level of a hepatocuprein and catalase of erythrocytes, extent of accumulation of toxic substances was estimated on the level of substances of low and average molecular mass in a blood plasma, erythrocytes and urine. It is revealed that at a chronic viral hepatitis C there is an imbalance of pro-oxidatic system and antioxidatic protection with accumulation of toxic substances in biological liquids of an organism which was more expressed at patients with an end-stage of renal pathology.Intensifying of a fibrogenesis and advance of pathological process in the infected liver can be negative consequences of the strengthened peroksidation of lipids at a chronic viral hepatitis C that is also promoted by accession of renal pathology.

Key words: viral hepatitis C, chronic glomerulonephritis, perekisny oxidation of lipids of biological membranes, substances of low and average molecular mass.

1. INTRODUCTION

The relevance of a problem of a chronic viral hepatitis C (CVH) doesn't raise doubts now. But it is impossible to forget that a viral hepatitis isn't limited to a liver lesion, and represent the general disease proceeding with development of different extrahepatic implications which quite often come to the forefront in a clinical picture of illness. The pathogenesis of extrahepatic implications and systemic complications at a chronic viral hepatitis bind to replication of viruses out of hepatocytes, for example, in kidneys, a pancreas and sialadens, formation of

the circulating immune complexes, activation of biological substances (cytokines and others) to the subsequent damaging action[9].

It is known that a chronic viral hepatitis B and C can lead to development of diseases of kidneys, for example, of a chronic glomerulonephritis, owing to immediate influence of viruses on kidneys or mediated, through development of inflammatory changes in vessels, so-called systemic vasculites.Membranoproliferativny glomerulonephritis (MPGN) bound to a cryoglobulinemia of the II type is the prevailing type of the HCV associated glomerulonephritis [18].

On the other hand, at patients with diseases of kidneys the risk of infection with hepatitis B or C is higher, than healthy people owing to existence of such potent risk factors have transmissions of infection as treatment by a hemodialysis, renal transplantation. Accession of a lesion of a liver to a lesion of kidneys often worsens a condition of the patient and also the forecast of a disease (faster development of a fibrosis of a liver with development of a cirrhosis and hepatocellular carcinoma) [4, 5, 13, 15].

2. METHODS AND MATERIALS

According to literature, at 8,5% of patients with a chronic viral hepatitis of C (CVH) at the age of 20-65 years and at 26,5% - at the age >65 yearsareHCV.

777 patients (8,6%) consisting in the Russian register of replacement renal therapy have CVH against the background of HCV [1].

HCV identification frequency (a hepatitis virus C) at the admixed cryoglobulinemia 80-90% reach [16, 24]. Among the infected HCV of people, the frequency of definition of cryoglobulins is 50-70%, however clinical implications of a cryoglobulinemia develop approximately at 15% from them [21].

The prevalence of HCV among patients of the dialysis centers in the world averaged 13,5% (assessment of these 8615 patients of the USA, the EU, Canada) [29]. The prevalence of a HCV infection among patients of the dialysis centers in Russia according to publications is from 7,6 to 24%% [6, 14].

According to us in the Center of a hemodialysis of Kabardino-Balkarian Republic 15,2% of patients from 330 people who are on dialysis are infected with a hepatitis C virus.

The role of the perekisny oxidation of lipids (POL) is important at diseases of a liver, kidneys, infectious diseases, disturbances of a hemodynamics, oncologic diseases, injuries and combustions. Therefore, studying of indicators of POL at patients with the combined lesion of a liver and kidneys is of undoubted interest. From the point of view of normal physiology perekisny oxidation of lipids is necessary for formation of steroid hormones, mediators of inflammation, cytokines and tromboksan. But when the quantity of products of data exchange of chemical reactions exceeds admissible value and peroxides damage cell organellas, break synthesis of DNA and proteins, the antioxidatic system reducing the number of free radicals of oxygen, ions of metals with a changeable valency comes into effect. Metabolic products of perekisny oxidation of lipids can collect in tissues and liquids of an organism if the antioxidatic system doesn't manage to utilize them with necessary rate [23]. Perekisny damage of proteic matters leads to their degradation and formation of toxic fragments, including, molecules of low and average molecular mass (BH and CMM) which began to consider markers of endogenic intoxication in recent years [12].

The virus of hepatitis C (HCV) causes the immunomediated injury of a liver, has a direct hepatotoxic action and also provokes an oxidative stress, strengthening thereby processes of perekisny oxidation of lipids (POL)[17].

Normal functioning of cellular and subcellular membranes depends on integrity of their phospholipid structures. The damages of a lipide biolayer of membranes interfaced to changes of viscosity are a stage of the necrotic mechanism of death of cells and are, as a rule, bound to activation the POL [10].

Destruction of polyunsaturated fatty acids leads to formation of toxiferous and chemically active metabolites – a low-new dialdehyde (LND) and a 4-gidroksiyenolaldegida. Usually about perekisny oxidation in tissues judge by quantity

of a low-new dialdehyde (LND) or other products giving a characteristic staining with thiobarbituric acid. The low-new dialdehyde can be metabolized by mitochondrions and microsomas, to form complexes with the aminocontaining bonds; at the same time there is an education the shiffovykh of the bases which, being inert in the majority, can collect in an organism [25, 26].

In an organism to the damaging action of products it is POL and active oxygen radicals the antioxidatic system (AOS) which components are the catalase, metallsvyazyvayushchy proteinases (hepatocuprein), vitamins E, C, beta-carotinum etc resists. The oxidative stress arises in cases of disturbance of balance between excess production of active forms of oxygen and antioxidatic protection [25, 26].

In researches of both domestic, and foreign authors the fact that the hepatocuprein (CPU) is the main antioxidant of a blood is noticed, binds superoxidic radicals and interferes with perekisny oxidation of lipids of cellular membranes [2]. A hepatocuprein – the cupriferous protein having properties of enzyme of a ferroksidaza and participating thanks to it in oxidation of divalent iron air oxygen (restoring oxygen to water). Synthesis of the plasma CPU is carried out mainly by liver cells, and maintenance of its level in a blood is controlled by a series of hormones and mediators of immune system: glucagon, corticosteroid hormones, class E2 Prostaglandinums, interleukin-1 [7]. The catalase is also the most important element of antioxidatic protection of an organism. The catalase catalyzes two-electron restoration of hydrogen peroxide to H2O [8]. Therefore, studying of activity of indicators about - and antioxidatic systems is very relevant task.

Research objective was studying of indicators of perekisny oxidation of lipids of biological membranes and accumulation of toxic substances in biological liquids of an organism at patients with a chronic viral hepatitis C against the background of chronic illness of kidneys.

3. RESULTS

Under observation there were 3 groups of patients: 25 people with chronic hepatitis C, moderate activity (ALT and AST is more than 3 norms) with degree of a fibrosis from 0-1 to 3. Man-15, women-10 aged from 35 up to 53 years. The second group 23 patients with CVH (ALT and AST is more than 3 norms, F from 0-1 to 3) + made a chronic glomerulonephritis. 13 people, with CVH (ALT and AST is more than 3 norms, F from 0-1 to 3) and with the 5th (terminal) stage of chronic illness of kidneys, being on a hemodialysis entered into the third group. All patients received pathogenetic therapy and at the time of the research didn't receive antiviral drugs. The control group of healthy was made by 30 people comparable to the examined patients on gender and age.

Extent of activation of the perekisny oxidation of lipids (POL) was estimated by amount of TBK-active agents - by means of determination of content of a low-new dialdehyde (MDA) on Ushyama with coauthors (1983) [28]. For assessment of antioxidant protection determined the level of a hepatocuprein (CPU) in a blood plasma by Ravin's method (V.S. Kamyshnikov, 2000) [7]. The catalase of erythrocytes was determined by a method to the described A.I. Karpishchenko (1999). For assessment of extent of accumulation of toxic substances owing to activization of processes of POL determined concentration of substances of low and average molecular mass in biological liquids of an organism by M.Ya. Malakhova method (1995)[11].

All measurements were made on a spectrophotometer of the Federation Council-46. The received results statistically were processed on the computer program «Statistic».

The blood from patients with HVGS without and with renal pathology was taken when entering in a hospital (RTsPB SPID State Healthcare Institution Nalchik) and at an extract from it, and from patients of the Center of a hemodialysis – before holding a session of replacement therapy.

As a result of the conducted researches at patients of the first group the contents ascending MDA in blood serum when entering in a

hospital on average exceeding normal indicators at healthy by 2,5 times is established (3,2μmol/l ±0,07; P<0,001), what corresponds and to literary data on activation of processes is POL at HVGS as reflections of the damaging action of a virus of hepatitis C on hepatocytes [3].Before an extract from a hospital as a result of the carried-out treatment reliable depression of level of a low-new dialdehyde which value didn't differ from the MDA level at healthy was observed(1,43μmol/l ±0,06; P>0,05).At the same time average values in the compared periods authentically differed from each other (P1<0,001) (table1).

Table 1 – Level of a low-new dialdehyde (μmol/l) in a blood of the examined patients

The studied indicator	Group of inspection	Research period	n	X±m	P	P1	P2
MDA μmol/l	Healthy (control)		30	1,3±0,08		-	-
	Patients with HVGS	I	25	3,2±0,07	<0,001	-	-
		II	25	1,43±0,06	>0,05	<0,001	-
	Patients with HVGS+ glomerulonephritis	I	23	4,0±0,09	<0,001	-	<0,001
		II	23	2,1±0,12	<0,001	<0,001	<0,001
	Patients with HVGS+ glomerulonephritis (end-stage)	I	13	4,6±0,19	<0,001	-	<0,001
		II	13	1,6±0,21	>0,05	<0,001	>0,05

Note: here and in tables 2-6 for patients with HVGS with renal pathology and without the periods of a research correspond: I – when entering in a hospital; II – at an extract from a hospital; for patients with HVGS and an end-stage of a glomerulonephritis the periods of a research correspond: I – prior to dialysis session; II – after dialysis session; R-reliability of differences in relation to healthy; R1-reliability of differences in relation to the previous period; P2 - in relation to indicators at patients with HVGS without pathology of kidneys.

At patients of the second group rising was also observed MDA when entering in a hospital. However, this rising was authentically more expressed, than at patients of the first group (4,0 μmol/l ±0,09; P2 < 0,001). At an extract from a hospital at patients with renal pathology the MDA level decreased, but remained authentically above, then at healthy and with patients without the accompanying lesion of kidneys in the corresponding period (2,1μmol/l±0,12; P<0,001; P2<0,001).

At patients of the Center of a hemodialysis before a session of replacement therapy the highest digits were observedMDA (4,6μmol/l±0,19;P<0,001; P2<0,001).

After the procedure of dialysis of MDA considerably decreased and reached the digits which don't have reliable differences from healthy (1,6μmol/l±0,21; P>0,05; P2>0,05)(table 1).

When studying maintenance of a hepatocuprein in a blood of patients the following was revealed. At patients with HVGS without lesion of kidneys depression of the CPU when entering in a hospital was observed (338mg/l±4,2;P<0,001) with normalization before an extract from a hospital (411mg/l±4,0;P>0,05; P1<0,001) (table2).

Table 2 – Level of a hepatocuprein (mg/l) in a blood of the examined patients

The studied indicator	Group of inspection	Research period	n	X±m	P	P1	P2
Ceruloplasmin mg/l	Healthy (control)			403±4,8	-	-	-
	Patients with HVGS	I	25	338±4,2	<0,001	-	-
		II	25	411±4,0	>0,05	<0,001	-
	Patients with HVGS+ glomerulonephritis	I	23	312±5,6	<0,001	-	<0,001
		II	23	381±7,0	>0,05	<0,001	<0,001
	Patients with HVGS+ glomerulonephritis (end-stage)	I	13	276 ±8,1	<0,001	-	<0,001
		II	13	389 ±9,3	>0,05	<0,001	>0,05

At patients with HVGS and a glomerulonephritis the depression of the CPU when entering in a hospital which was more expressed than at patients of the first group was also observed (312 mg/l ±5,6; P><0,001; P2<0,001). At an extract from a hospital at these patients the CPU level raised and

approached norm, but was authentically below, at patients without the accompanying lesion of kidneys in the corresponding period(381mg/l ±7,0; P>0,05; P1<0,001; P2<0,001).

At patients with CVH and an end-stage of a lesion of kidneys before the procedure of replacement therapy the lowest digits of the CPU, reliable below, then in the corresponding period of patients of the first group were observed (276 mg/l ±8,1; P<0,001; P2<0,001). After dialysis the CPU level at this group of patients considerably increased and reached the level which doesn't have reliable differences from healthy (389mg/l ±9,3; P>0,05; P2>0,05) (table2).

When studying level of an intracellular antioxidant of a catalase of erythrocytes at patients of the first group ascending of level of a catalase of erythrocytes when entering in a hospital on average exceeding normal indicators at healthy is established (52,3 mmol/min.l. ±1,5; P<0,001). After the carried-out pathogenetic therapy before an extract from a hospital reliable depression of level of a catalase of erythrocytes to value at healthy was observed (40,8 mmol/min.l. ±1,8; P>0,05). Indicators in the first and second periods of a research authentically differed from each other(P1<0,001) (table3).

In the second group of patients (chronic VGS+ pathology of kidneys) rising of a catalase of erythrocytes in the first period of a research (was also observed when entering in a hospital). This rising was authentically more expressed, than at patients of the first group группы(64,1 mmol/min.l. ±1,4; P2<0,001). In the second period of a research, at an extract from a hospital at patients of this group the level of a catalase of erythrocytes decreased, but remained authentically above, then at healthy and with patients without the accompanying lesion of kidneys in the corresponding period (49,8mmol/min.l.±1,3; P<0,001; P1<0,001; P2<0,001).

At patients of the third group (patients of the Center of a hemodialysis) before a session of replacement therapy the highest digits of a catalase of erythrocytes which were authentically differing from indicators at healthy and the first group in the corresponding period were observed (67,5mmol/min.l.±1,7;P<0,001; P2<0,001).

After the procedure of dialysis appreciable depression of level of a catalase of erythrocytes which reached level at healthy and had no reliable differences neither from healthy, nor from the corresponding period of the first group became perceptible (42,1mmol/min.l.±1,6; P>0,05; P2>0,05) (table3).

Table 3 – Level of a catalase of erythrocytes (mmol/min.l.) at the examined patients

The studied indicator	Group of inspection	Research period	n	X±m	P	P1	P2
Catalase of erythrocytes (mmol/min.l.)	Healthy (control)		30	41,2±1,0	-	-	-
	Patients with HVGS	I	25	52,3±1,5	<0,001	-	-
		II	25	40,8±1,8	>0,05	<0,001	-
	Patients with HVGS+ glomerulonephritis	I	23	64,1±1,4	<0,001	-	<0,001
		II	23	49,8±1,3	<0,001	<0,001	<0,001
	Patients with HVGS+ glomerulonephritis (end-stage)	I	13	67,5±1,7	<0,001	-	<0,001
		II	13	42,1±1,6	>0,05	<0,001	>0,05

The obtained data on patterns of change of a catalase of erythrocytes at patients with chronic hepatitis C confirm appreciable compensatory opportunities of the erythrocytes participating in intracellular exchange of oxygen and about value of a catalase of erythrocytes as the active intracellular antioxidant playing an important role in a pathogenesis of this infectious disease.

Concentration of BH and CMM as indicators of accumulation of toxic substances as a result of activization of processes the POL was defined in various biological liquids of an organism of sick HVGS: in a blood plasma, erythrocytes and urine.

During the conducted researches it is taped that concentration of BH and CMM was increased in relation to healthy in the disease height period (when entering in a hospital) at the examined patients in

a blood plasma, erythrocytes and urine (13,8conventional units ±0,2; P<0,001; 24,0conventional units ±0,21 P<0,001; 52,3conventional units ±0,4 P<0,001)(table 4).

Before an extract from a hospital, as a result of the carried-out treatment the studied indicators decreased and reached normal indicators in all mediums: in a blood plasma (10,1±0,21;P>0,05), erythrocytes (19,4conventional units ±0,22; P>0,05), in urine (52,3conventional units ±0,4 P>0,05) (table 4).

Table 4 – The maintenance of BH and CMM in biological liquids of an organism at patients with HVGS (conventional units)

Medium of a research	Research period	N	(X ±m)	P	P1
Blood plasma	3.	30	9,3±0,31	-	-
	I	25	13,8±0,2	<0,001	-
	II	25	10,1±0,21	>0,05	<0,001
Erythrocytes	3	30	18,9±0,30	-	-
	I	25	24,0±0,21	<0,001	-
	II	25	19,4±0,22	>0,05	<0,001
Urine	3	30	30,2±0,24	-	-
	I	25	52,3±0,4	<0,001	-
	II	25	31,5±0,32	>0,05	<0,001

During the conducted researches it is taped that concentration of BH and CMM was increased in relation to healthy in the disease height period (when entering in a hospital) at the examined patients in a blood plasma, erythrocytes and urine (13,8conventional units ±0,2; P<0,001; 24,0conventional units ±0,21).

Before an extract from a hospital, as a result of the carried-out treatment the studied indicators decreased and reached normal indicators in all mediums: in a blood plasma (10,1conventional units±0,21; P>0,05), erythrocytes (19,4conventional units±0,22; P>0,05), in urine (52,3conventional units±0,4 P>0,05) (table 4).

In group of patients with HVGS and a chronic glomerulonephritis concentration of BH and CMM in a blood plasma was authentically increased in the disease height period in relation to healthy (16,2conventional units ±0,2; P<0,001)and to the corresponding period in group of sick HVGS without pathology of kidneys (P2<0,001).In the period of an early reconvalescence the studied indicator decreased, but remained authentically above, then at healthy and sick the first group in the corresponding period (12,3conventional units ±0,16; P<0,001; P2<0,00).

In erythrocytes rising of the BH and CMM level in both periods had no reliable differences from indicators of the first group in the corresponding periods (table 5).

Table 5 – The maintenance of BH and CMM in biological liquids of an organism at patients with HVGS and a chronic glomerulonephritis (conventional units)

Medium of a research	Research period	N	(X ±m)	P	P1	P2
Blood plasma	3.	30	9,3±0,31	-	-	-
	I	23	16,2±0,2	<0,001	-	<0,001
	II	23	12,3±0,16	<0,001	<0,001	<0,001
Erythrocytes	3	30	18,9±0,30	-	-	-
	I	23	25,1±0,2	<0,001	-	>0,05
	II	23	19,5±0,32	>0,05	<0,001	>0,05
Urine	3	30	30,2±0,25	-	-	-
	I	23	63,1±0,35	<0,001	-	<0,001
	II	23	42,1±0,25	<0,001	<0,001	<0,001

In urine the studied indicator was authentically higher in both periods of a research, than at patients of the first group is (table 5) that it is probably possible to explain with depression of detoksikatsionny function of kidneys at their pathology.

Patients of the third group (HVGS+ an end-stage of a renal failure) had the maximum rising of the BH and CMM level in all studied organism liquids prior to a procedure of a hemodialysis, reliable above, than at healthy and in the first group in the corresponding period (in blood plasma18,3conventional units ±0,15; P<0,001; P2<0,001; in erythrocytes 28,5conventional units ±0,22; P<0,001; P2<0,001; inurine67,5conventional units ±0,41 P<0,001; P2<0,001) (table6).

After the procedure of a hemodialysis in biological liquids of an organism there was a normalization of the BH and CMM level. The received digits had no reliable differences from indicators at healthy and at patients of the first group in the corresponding periods (table 6).

Table 6 – The maintenance of BH and CMM in biological liquids of an organism at patients with HVGS and an end-stage of a renal failure (conventional unit.)

Medium of a research	Research period	N	(X ±m)	P	P1	P2
Blood plasma	3.	30	9,3±0,31	-	-	-
	I	13	18,3±0,15	<0,001	-	<0,001
	II	13	9,8±0,2	>0,05	<0,001	>0,05
Erythrocytes	3	30	18,9±0,30	-	-	-
	I	13	28,5±0,22	<0,001	-	<0,001
	II	13	19,8±0,23	>0,05	<0,001	>0,05
Urine	3	30	30,2±0,25	-	-	-
	I	13	67,5±0,41	<0,001	-	<0,001
	II	33	30,7±0,23	>0,05	<0,001	>0,05

Fast normalization of the studied indicators at patients after the procedure of a hemodialysis has a talk with an end-stage of a renal failure detoksikatsionny effect of the carried-out manipulation. According to various authors such patients have features of a HCV infection in the conditions of treatment by a hemodialysis in comparison with the general population of sick HGS: the virus load is lower, the activity of aminotransferases is reduced, gravity of morphological changes is less, cirrhosis and a hepatocellular carcinoma develops less often[20, 22].

4. DISCUSSION

Clinical example. Sick B., 1958 is on treatment by a program hemodialysis in the dialysis center OOO «SKNC» from 21.11.2014. till present with the following diagnosis.

The main: a chronic glomerulonephritis, the admixed form. Chronic illness of kidneys of C5, dialysis stage.

Basic complications: a chronic renal failure, IIIAnd a stage (according to S.I. Ryabov), an anury, an uremia, a secondary nephrogenic arterial hypertonia.

Accompanying: a chronic viral hepatitis With, moderate activity, a fibrosis F0-1.

For the first time the virus of hepatitis C was found in 2015. The genotype wasn't defined, didn't receive antiviral treatment. The program of dialysis includes 3 procedures a week 4 hour - 4 hours 20 minutes. Acceptability of procedures satisfactory. Efficiency of depression of urea – 81%.

Results of inspection of sick B. were the following: blood urea before dialysis - 27,6 mmol/l, after – 5,3 mmol/l, MDA before dialysis

– 5,1 μmol/l, posle-1,4 μmol/l, hepatocuprein level before dialysis – 284 mg/l, after – 1,5 mg/l, a catalase of erythrocytes before dialysis – 68,4 mmol/min.l, after the procedure of dialysis - 41,1 mmol/min.l. The BH and SMM level of a blood plasma before dialysis – 19,1 conventional units., after – 11,2 conventional units., BH and SMM of erythrocytes – before dialysis – 24,3 conventional units., after - 18,8 conventional units., BH and SMM of urine – prior to a procedure of replacement therapy – 60,7 conventional units., after – 43, 2 conventional units.This example shows that the being available imbalance about - and antioxidatic systems and accumulation the nedookislennykh of substances and other toxic products prior to a procedure of dialysis is completely leveled after it.

5. CONCLUSIONS

Thus, at a chronic viral hepatitis C the rising of activity of processes of perekisny oxidation of lipids of biological membranes which was more expressed in the presence of pathology of kidneys, especially in a terminal dialysis stage was observed. At the same time there was a depression of level of a hepatocuprein as indicator of a condition of antioxidatic system, also more expressed at patients with pathology of kidneys in an end-stage. Compensatory opportunities of an intracellular antioxidant of a catalase of erythrocytes appeared enough for maintenance of this substance at the high level in response to ascending of activity of pro-oxidatic system.

The imbalance of pro-oxidatic system and antioxidatic protection demonstrates disturbance of equilibrium of these systems with accumulation of toxic forms of free radicals and reactive metabolites and rising of content in biological liquids of an organism of substances of low and average molecular mass. The taped disturbances are more expressed at patients with a combination of a chronic viral hepatitis and a glomerulonephritis, especially in an end-stage. As a result of disturbance of synthetic, metabolic and detoksitsiruyushchy function of a liver at its lesion in an organism various toxic substance, such as mediators of an oxidative stress, nitrogen oxide, Sodium lactatum, inflammatory cytokines, etc. collect. As a result, systemic lesions – circulation disturbances, coagulative and immunologic disorders develop. In addition, the secondary lesion of a liver owing to excess of inflammatory mediators and metabolites of an oxidative stress takes place that leads to a clinical manifestation of multiorgan dysfunction [19]. The accompanying disturbance of functions of kidneys aggravates these processes. Intensifying of a fibrogenesis and advance of pathological process in the infected liver can be negative consequences of the strengthened peroksidation of lipids at HVGS that is also promoted by accession of renal pathology.

6. LITERATURE

1. BikbovB.T. TomilinaN.A. Replaceme nt therapy of patients with a chronic renal failure in the Russian Federation in 1998-2011. (Report on data of the Russian register of replacement renal therapy. Part one) // Nephrology and dialysis, 2014. 16(1): p.90
2. Vasil'evV.B., Kachurin A.M., SorokaN.V. Dismutirovaniye of superoxidic radical's mechanism detail hepatocuprein//Biochemistry. - 1996. - T.61, № 2. - P. 296-307
3. GeivandovaN.I., YagodaA.V., GudzovskayaD.A., Kostornaya I.V. Serumal phospholipids, indicators of perekisny oxidation of lipids and antioxidatic protection as additional non-invasive markers of activity of a chronic viral hepatitis C // RJGGK. - 2008. - T.18. - №6. - P.38-42.
4. Zubkin M.L., Sil'kovaE.P., StahanovaV.M. Hepatitis B in the centers of a hemodialysis of Moscow: clinic-epidemiological characteristic // Nephrology and dialysis. 2001. T. 3. № 4. P. 442–447.
5. ZubkinM.L. HBV- and HCV-infections at the patients receiving treatment by a program hemodialysis; a hepatitis B vaccinal prevention algorithm at a

chronic renal failure: Autoref. Doctormedical sciences. M., 2004. 42 p.
6. ZubkinM.L. Chronic HCV-infection: internist view (II part)// Therapeutic archive 2016.- № 11.- P.138-148.
7. KamishnikovV.S. Reference book on kliniko-biochemical researches and laboratory diagnostics. - M.: Medical press-inform.-2009.-896p.
8. KseikoD.A., GeningT.P. Antioxidant resistance of erythrocytes after a hemorrhage and in the conditions of correction by ascorbic acid // Basic researches. – 2014. – № 12-11. – P. 2357-2360.
9. RostangL. Hepatitis S viral infection at nephrological patients // J. Kidneys, №1 (3), 2013.
10. MakarovV.K. Blood serum phospholipids in differential diagnostics of a chronic viral hepatitis B and a cirrhotic stage of a disease //Clinical laboratory diagnostics – 2003. – № 2. – P. 41–42.
11. MalahovaM.Ya.Method of registration of endogenic intoxication: Methodical references. - SPb, 1995. - 33 p.
12. MalahovaM.Ya.Endogenic intoxication as reflection of compensatory reorganization of metabolic processes in an organism // Efferent therapy.-2000.-T.6, 34. P.3-14.
13. Mukomolov S.L., Levakova I.A., SinaiskayaE.V. The epidemiological characteristic of a viral hepatitis B and C in units of a hemodialysis in St. Petersburg during the modern period // Infection and immunity. 2011. T. 1. № 2. P. 143–150.
14. MukomolovS.L., LevakovaI.A. The epidemiological characteristic of chronic hepatitises in the Russian Federation in 1999-2009 // Infection and immunity. – 2011. – T.1, №3. – P. 255-262.
15. YaroshL.V., SemenenkoT.A., Nikitina G.Yu. Prevalence of markers of an infection with viruses of hepatitises B and C in units of a hemodialysis//the Nephrology and dialysis. –2013. – T.15, №4.
16. Agnello V. A role for hepatitis Cvirus infection in type II cryoglobulinemia//N Engl J Med 1992. 327(21): P. 1490-1495;
17. Berson A., Beco V., Letterson P. Steatohepatitis-inducing drugs cause mitochondrial dysfunction and lipid peroxidation in rat hepatocytes // Gastroenterology. – 1998. 114. – P. 764–774.
18. D'Amico G. Renal involvement in hepatitis C infection: cryoglobulinemic glomerulonephritis // Kidney Int. 1998. 650 p.
19. Evenepoel P., Naesens M., Claes K. Tertiary hyper hosphatoninism' accentuates hypophosphatemia and suppres ses calcitriol levels in renal transplant recipients // Am. J. Transplant. – 2007. – № 7. – P. 1193–1200.
20. Fabrizi F, Martin P, Ponticelli C. Hepatitis C virus infection and renal transplantation // Am J Kidney Dis 2001; 38 (5): P. 1009-1015.
21. Ferri C., Sebastiani M., Giuggioli D., Cazzato M., Longombardo G., Antonelli A., Puccini R., Michelassi C.,Zignego A.L. Mixed cryoglobulinemia: demographic, clinical, and serologic features and survival in 231 patients // Semin Arthritis Rheum. - 2004 - № 33 - P. 355-74.
22. Ishida H., Agishi T., KoyamaH. Hemodialysis paradox: survey on the incidence rate of hepatocellular carcinoma in antihepatitis virus C-antibody-positive chronic hemodialysis patients // Artif Organs. 2001. 25(1): P. 58-60.
23. Larrea E., Beloqui O., Munosnavas M. Superoxide dismutase in patients with chronic hepatitis C virus infection //

Free Radic. Biol. Med. – 1998. – V. 24. – P. 1235–1241.

24. Misiani R. Hepatitis C virus infection in patients with essential mixed cryoglobulinemia // Ann Intern Med 1992. 117(7). P. 573–577.
25. Parola M., Robino G. Oxidative stress-related molecules and liver fibrosis // J. Hepatol. – 2001. – V. 35. – P.297–306.
26. Svegliati B., D'Ambrosio L., Ferretti G. Fibrogenic effect of oxidative stress on rat hepatic stellate cells // Hepatology. – 1998. – V. 27. – P. 720–726.
27. SenakaP.Hepatology2015; 62(suppl):1120A.
28. Ushiama M., Michiara M. //Biochem.– 1978.– V.86.– №1.– P. 271–278.
29. World Health Organization 2008. Avallabble at: http://www.who.int/index.html