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HEPATOBILIARY SYSTEM DISEASES AS THE PREDICTORS OF PSORIASIS PROGRESSION

Purpose of the study. *To assess the state of the hepatobiliary system in psoriasis and psoriatic arthritis in order to establish a causal relationship and to identify clinical and functional predictors of psoriatic disease progression.* ***Methods.*** *The study included patients with extensive psoriasis vulgaris (n=175) from the age of 18 to 66. Divided into 3 groups: 1 — psoriasis patients with isolated skin lesions (n=77), 2 — patients with psoriatic arthritis (n=98), 3 — apparently healthy blood donors (n=30), matched by sex and age. The evaluation of functional state of the hepatobiliary system was performed by analysis of the clinical and anamnestic data and by the laboratory- instrumental methods.* ***Results.*** *Identified predictors psoriasis: triggers (stress and nutritional factor), increased total bilirubin, aspartate aminotransferase, alkaline phosphatase, gamma-glutamyl transferase, eosinophilia, giardiasis, carriers of hepatitis C virus, and changes focal ductal formation in the liver , thickening of the walls of the gallbladder by ultrasound. Predictors of psoriatic arthritis: age over 50 years, dyspeptic complaints, the presence of hepatobiliary system diseases, the positive right hypochondrium syndrome, the clinical symptoms of chronic cholecystitis, excess body weight, high levels of bilirubin, cholesterol and low density lipoprotein, hepatomegaly, non-alcoholic fatty liver disease.* ***Conclusion.*** *High activity of hepatocytes cytolysis, cholestasis, inflammation, metabolic disorders can be considered psoriatic arthritis as a severe clinical stage psoriatic disease where the hepatobiliary system, in turn, is one of the main target organs in systemic psoriatic process. Non-alcoholic fatty liver disease and chronic cholecystitis are predictors of psoriatic disease progression.*

Key words: *psoriasis; psoriatic arthritis; psoriatic disease; hepatobiliary system; non-alcoholic fatty liver disease.*

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RELEVANCE

Psoriasis (**PS**) is systemic chronic recurrent disease, which is manifested by hyper proliferation of keratinocytes and is characterized by lesions and injuries of different organs and systems with predominant involvement of skin into pathology process [1−4]. Actuality of studying PS is caused by high prevalence of the disease, the formation of severe forms, resistant to therapy, increasing mortality among the patients, insufficient efficiency of the present methods of pathogenic and symptomatic treatment [**Ошибка! Источник ссылки не найден.**]. One of the most severe clinical forms of PS progression, which involves the formation of irreversible disabling bone-destructive injuries is psoriatic arthritis (**PsA**) [**Ошибка! Источник ссылки не найден.**,7].

Participation of cardio-vascular, digestive nervous and other systems of an organism in the pathological process allows distinguishing PS and PsA in terms of systemic disease that is psoriatic disease [8]. Manifestations of liver and bile ducts diseases can be shown by different extra organ signs, including skin scaly rash. That is why an important role in semiotics of organopathies belongs to functional changes in hepatobiliary system **(HBS),** their presence in PS and PsA being from 42.0 to 71.0 % cases [9−12]. HBS diseases negatively influence the course of psoriatic disease, they cause frequent recurrence, increase the severity of skin processes and resistance to pharmacotherapy [13,14]. Liver is involved into albumen, fat, carbohydrate, water, mineral and pigment metabolism, and also fulfills detoxification function. So, it can be supposed

that in PS and PsA pathogenesis hepatobiliary system initiates and enhances the expressiveness of endotoxicosis, inflammatory response, immune imbalance, supports the disturbances of regeneration processes in skin and joints [15,16]. Besides, both endotoxinemia and long-time immune suppressive therapy in PS result in liver cells damaging [14].
Despite some interest had been shown to such issue as the association between HBS and PS, there is no data on clinical functional predictors in terms of psoriatic disease progression. This is resulted in the limited number of the data in scientific literature related to the methods of biliary pathology screening in patients with different clinical forms and severity of PS as well as pathology progression.
Study Objective: to evaluate the state of hepatobiliary system in psoriasis and psoriatic arthritis in order to determine causal associations and revealing clinical functional predictors of the progression of psoriatic disease.

METHODS

DESIGN OF THE RESEARCH

Controlled non-randomized research.

Research includes the patients with psoriasis vulgaris PS (n=175) aged from 18 to 66 years.

ELIGIBILITY CRITERIA

Criteria for admission into the research: the presence of clinically approved PS or PsA. Written informed consent from the patients in regard to their participation in the research.
Criteria for refusal for the research: the presence of underlying somatic chronic diseases in the stage of decompensation, the therapy which involves systemic glucocorticosteroid or cytostatic drugs specified in medical history, the presence of benign or malignant tumors, diabetes mellitus, systemic and psychic diseases, pregnancy, lactation, alcoholism and/or drug addiction.

CONDITIONS OF THE RESEARCH

Examinations for the patients and material collection had been performed in Regional Dermato Venereology Hospital №1, the city of Krasnoyarsk, in years 2008 – 2009 and 2013 – 2014. Laboratory and instrumental studies had been carried out in the clinics and laboratory for molecular cellular physiology and pathology of Scientific Research Institute for Medical Problems of the North.

DURATION OF THE RESEARCH

We examined and tested the patients and collected the materials in years 2008 – 2009 and 2013 – 2014.

DESCRIPTION OF MEDICAL INTERVENTIONS

We collected medical history and carried out physical examination for studying skin, did anthropometric measurements (with height meter and scales), performed examination for determining the state of hepatobiliary system: abdominal palpation, definition of Kher's signs, the symptoms of Mussy (phrenicus-symptom) and Ortner-Grekov.
Abdominal palpation is carried out for the patient who lies on the back with hands down the sides of the body or folded on the chest, with legs straight out. The doctor applies the gloves to the hands and sits with his right side to the patient, facing him/her. Palpation is carried out by right hand on symmetrical areas of abdomen wall, by whole fingers, palm down. A doctor

sequentially palpates the examined area starting from abdomen paired regions, like iliac, hypochondriac or lateral, moving then to unpaired regions like epigastric, umbilical and suprapubic. Palpation for gallbladder is carried out in the region of the lower edge of the liver, outwards from the lateral edge of the abdominal right rectus muscle, approximately in the area of the crossing between horizontal line, drawn at the level of the IX ribs and right midclavicular line. Kehr signs are determined by palpation in right hypochondrium on the level of inhale. The symptom of Mussy is determined by pressing in between pedicles of sternocleidomastoid muscle. Symptom of Ortner-Grekov is determined by percussion on the right part of costal margin with the side of the hand.

Laboratory tests were carried out in accordance with the standards of medical assistance: complete blood test, blood biochemical analysis, tests for detecting hepatitis B virus antigen (HbsAg); total antibodies to hepatitis C virus (anti-HCV), helminth antigens (*Opisthorchisfelineus*, *Toxocaracanis*, *Trichinellaspiralis*, *Echinococcusgranulosus*, *Lambliaintestinalis*). We had used peripheral blood as the material for laboratory research. It was obtained from median cubital vein in the morning after an overnight fast in the amount of 8−10 ml. Blood was taken into sterile disposable vacutainers. The algorithm of the procedure is as follows: patient's data are recorded in the register, vacutainers and referrals are marked, patient is seated or laid down comfortably, his arm (elbow joint) should not be folded. It is necessary to put a bolster or a specially designed pillow under the elbow joint. Rubber tourniquet is twisted tightly around the middle of the elbow above textile napkin, patient is asked to clench and unclench his fist, the skin is treated with alcohol-wetted cotton pellet and then vein puncture is performed with a special blood sampling transfer needle. Vacutainer is attached to the transfer needle after it had entered the vein. After blood sampling had been completed the full vacutainer is removed. The needle is taken out right after an alcohol-wetted cotton pellet had been pressed down to venipuncture area. The patient is asked to press the cotton pellet and keep it at the elbow joint for approximately 5 minutes. The marked test-tubes are put into special container in order to transport them to the laboratory. All the instruments and materials, having been used are disinfected and utilized.

Ultrasound screening for abdominal cavity organs was carried out in the fasted state. Prior to the procedure patient's skin is covered with special ultrasound gel in the area of abdominal cavity. 3.5 MHz transducer is placed onto the central part of upper abdominal sector below xiphoid process, then the doctor asks the patient to take a deep breath and hold the breathe a bit after inhaling. Then the patient breathes regularly, the doctor moves the transducer along the front abdominal wall. Upon the completion of the procedure, the patient cleans away the ultrasound gel from the skin with a napkin.

RESULTS OF THE RESEARCH

Primary results of the research

After sampling blood processing we obtained the results of complete blood count: common leukocyte count, differential leukocyte count, erythrocyte sedimentation rate. We also obtained the results as biochemical indices for total bilirubin and its fractions, common cholesterol, lipoproteins, Aspartate Aminotransferase (AST), Alanine Aminotransferase (ALT), Gamma-Glutamyltransferase (GGT), alkaline phosphatase (AP). Besides, after blood processing, we obtained the results of our immunological research: qualitative determination of HbsAg, anti-HCV, total antibodies to helminth antigens (*O.felineus*, *T.canis*, *T.spiralis*, *E.granulosus*, *L.intestinalis*). As a result of ultrasound screening we obtained the data related to hepatomegaly, diffuse and ductal changes in liver, focal formations in liver and lesions.

There are no additional results of the study.

There were no complications developed in the examined subjects.

ANALYSIS FOR SUB-GROUPS

Patients with extensive psoriasis vulgar had been included into the research (n=175) in the ages

from 18 to 66 years and practically healthy blood donors (n=30), of the same age and gender: the 1st group: psoriasis patients (PS, n=77), the 2nd group: psoriatic arthritis patients (PsA, n=98), the 3rd group: control.

METHODS FOR REGISTRATION OF OUTCOMES

Medical examination for PS and PsA patients was carried out in accordance with specially designed unified protocol, comprising 15 items, including the description of the results of the survey, patients' reports and results of physical examination. All the items of the protocol were included into the database in the form of Microsoft Excel 2007 tables. All the patients had been examined at progressive stage of skin process and before symptomatic and pathogenic therapy. The severity of PS and the extension of skin process were evaluated by calculating the Psoriasis Area and Severity Index (**PASI**), taking into account the level of activity (expressiveness) of the main clinical signs (erythema, infiltrations, desquamations) and the areas of pathologic processes [1].

Evaluation of HBS functional state was carried out by the analysis of clinical anamnestic data and laboratory- instrumental methods of studying. Main items of the protocol include data sheet, anthropometry, (body mass index, BMI), complaints related to digestive tract (dyspepsia, right hypochondrium syndrome), anamnestic data on digestive tract pathology (the presence of digestive tract and HBS pathology in medical history, associations between acute HBS pathology and PS), spectrum and value of trigger factors of PS and PsA onset and exacerbation, description of skin and joint processes, data on objective examination for hepatobiliary system (abdomen and gallbladder palpation, determination of Kher's signs, the symptoms of Mussy (phrenicus-symptom) and Ortner-Grekov.

Laboratory instrumental tests for liver and biliary tract had been carried out in city gastroenterology center on the premises of the clinics of Scientific Research Institute for Medical Problems of the North. Complete blood count had been performed for all the patients. HbsAg, total anti-HCV and those to helminth antigens had been determined by ELISA. Liver and biliary tract ultrasound screening was carried out with Medison Sono Ace-X6 (Medison, Southern Corea) equipment.

ETHIC EXPERTISE No 12 dated December 10, 2007.

The right to perform the research on legal grounds had been assigned by patients' informed written consent. Examination protocol related to patients and healthy subjects (control group) corresponded to ethical standards and were approved by the Committee for Biomedical Ethics of Scientific Research Institute for Medical Problems of the North.

STATISTICAL ANALYSIS

Principals of an appropriate calculation of the sample size

We didn't make preliminary calculations for sample size.

Methods of statistical analysis of the data

Statistical processing of the obtained results was carried out by applied programs Statistica 6.0. Normality of distribution of parameters' meanings was evaluated with the help of Shapiro-Wilk test. In order to calculate the coefficient of pair correlation we used the technique called Spearman's Correlation Coefficient. The results are represented by median (Me) and interquartile range as 25 % and 75 % percentiles: Me (25 %; 75 %) or M±m. For statistical analysis of all the kinds, the differences were regarded as statistically meaningful having achieved the level of meaningfulness of $p \leq 0{,}05$.

RESULTS

PARTICIPANTS OF THE RESEARCH

In PsA cohort women were significantly more frequent (61.2 %), and in PS cohort the majority were the men (70.2 %); $p_{1,2}=0.00004$. Average age of PS patients was 31.0±1.41 years of age and PsA patients 49.12±1.22 years of age; $p_{1,2}=0.04$.

PRIMARY RESULTS OF THE RESEARCH

The age of PS and PsA onset in the examined patients varied from 5 to 60 years and amounted to 25.0±0.9 on average. The duration of the disease in the examined patients was in the range from 2 months to 47 years (7.0±1.2 years on average in PS and 18.0±1.4 years on average in PsA); $p_{1,2}$= 0.000003. The meaning of PASI index fluctuated from 2.8 to 41.7 and amounted to 14.3±0.9 in PS and 18.2±1.3 in PsA on average; $p_{1,2}$= 0,03.

We defined the main triggering factors of PS and PsA exacerbation after the results of the analysis of the data from the patients' medical histories. We marked the association of skin process exacerbation in PS and PsA with psycho emotional stress: 75.5 and 75.0 %, correspondingly; $p_{1,2}$=0.9. Nutrition factors (overeating, the consumption of fatty, spicy, fried dishes as well as alcohol) were the reasons of exacerbations of PS in 67.3 % cases, PsA in 60.4 %; $p_{1,2}$=0.6.

The analysis of the patients' medical histories showed that PsA is associated with increased frequency of the prevalence of digestive tract diseases. In PsA patients the signs of gastrohepatic dyspepsia are marked considerably more frequently (such complaints as heartburn, nausea, tympanitis) in comparison with PS patients, 43.7 and 24.4 % correspondingly; $p_{1,2}$=0.04. Digestive tract diseases (chronic gastro duodenitis, chronic cholecystitis, chronic pancreatitis) are considerably more frequent in PsA as compared to PS, 56.2 and 34.7 % correspondingly; $p_{1,2}$=0.03.

Psoriatic arthritis in comparison with psoriasis is characterized by the presence of polyvalent clinical signs of cholecystitis (Table 1).

Table 1. Characteristics of clinical anamnestic indices in psoriasis (PS) and psoriatic arthritis (PsA)

Clinical index	PS(1) (n=77)	PsA(2) (n=98)	$p_{1,2}$
Complaints related to pains and heaviness in right hypochondrium, %	14.3	35.4	0.016
Hepatobiliary system diseases in medical history, %	4.0	22.0	0.016
Tenderness in right hypochondrium region on palpation, %	16.3	34.5	0.004
Other signs of gallbladder diseases after the data of objective examination (bladder symptoms), %	48.9	79.2	0.003
Body mass index, kg/sm^2	24.2±0.5	26.2±0.7	0.001

Note. Significance of differences (p) — Mann-Whitney criterion.

Taking into account the anamnestic data including those related to life style, we found that PsA patients as compared to PS shows more frequently the syndrome of right hypochondrium (such complaints as pain and heaviness in hypochondrium area) as well as HBS diseases (chronic cholecystitis, gallbladder dyskinesia, liver fatty degeneration). The involvement of HBS into pathology process is confirmed by the presence of palpation tenderness in right hypochondrium area, which is more frequent in PsA than in PS. Besides, PsA patients considerably more frequently show the signs of chronic cholecystitis as compared to PS. In PS patients monovalent signs of gallbladder diseases prevail (one gallbladder symptom) in 75.0 %, and in PsA patients polyvalent (over two gallbladder symptoms) were revealed in 57.9 % cases; $p_{1,2}$= 0.003. So, in the structure of the signs of gallbladder diseases after examination we found in PsA the predominance of Kehr's signs (39.6 %) and symptoms of Ortner-Grekov (35.4 %), t the same time Mussi symptoms and Murphy symptoms were less frequent (16.6 %).

Having analyzed **BMI** we marked its increased level in PsA patients as compared to PS. Excessive body mass (BMI≥25) in PsA was marked in 64.2 % cases and in PS in 41.5 % cases;

$p_{1,2}$= 0.001.
While studying biochemical indices in blood in psoriatic disease we revealed the signs of hepatocyte cytolysis and cholestasis (Table 2).

Table 2. Characteristics of blood biochemical indices in psoriasis (PS) and psoriatic arthritis (PsA), Me (25 %; 75 %)

Blood biochemical indices	**PS (1) (n=77)**	**PsA (2) (n=98)**	**Control (3) (n=30)**	***p***
Common bilirubin, mcmol/l	14.5 [12.4; 17.0]	16.3 [12.3; 18.7]	12.3 [10.5; 13.6]	$p_{1,2}$=0.05 $p_{1,3}$=0.000001 $p_{2,3}$=0.00001
Aspartate Aminotransferase, Item/l	27.3 [19.0; 43.7]	26.0 [18.2; 45.4]	15.7 [12.9; 20.9]	$p_{1,2}$=0.6 $p_{1,3}$=0.000001 $p_{2,3}$=0.000006
Gamma Glutamyl transferase, Item/l	20.1 [14.1; 25.3]	18.6 [13.9; 28.2]	12.9 [11.5; 16.5]	$p_{1,2}$=0.7 $p_{1,3}$=0.00007 $p_{2,3}$=0.005
Alkaline phosphatase Item/l	57.4 [52.4; 71.5]	78.9 [61.9; 101.1]	49.3 [37.5; 57.4]	$p_{1,2}$=0.09 $p_{1,3}$=0.01 $p_{2,3}$=0.0001
Common cholesterol, mmol/l	4.2 [3.8; 5.6]	5.0 [4.3; 6.1]	4.26 [3.9; 5.0]	$p_{1,2}$=0.03 $p_{1,3}$=0.6 $p_{2,3}$=0.002
Cholesterol of lipoproteins of low density, mmol/l	1.98 [1.55; 2.48]	2.6 [2.3; 3.3]	1.66 [1.48; 2.09]	$p_{1,2}$=0.03 $p_{1,3}$=0.4 $p_{2,3}$=0.001

Note. Significance of differences (*p*) **—** Mann-Whitney criterion.

Cytolysis is caused by the changes in the permeability of hepatocyte membranes and penetration of intracellular content into intercellular matrix and blood. Cytolysis is one of the main parameters of the activity of pathology process in liver and is characterized by the increased activity of liver enzymes (AST and ALT), bilirubin, Vitamin B12 and ferrum [17]. So, in both PS and PsA we revealed statistically meaningful increase of common bilirubin levels and AST as compared to control group. Common bilirubin level in PsA is considerably higher in comparison with PS, which proves high activity of hepatocyte cytolysis in patients with the presence of joint syndrome. The results of ultrasound screening also prove hepatocytes disorders, namely liver parenchymal changes in both groups of patients, which are shown by diffuse changes in liver structure with increased or lowered echo-density of the organ ($p_{1,3}$=0.01; $p_{2,3}$=0.004). Hepatomegaly is significantly more frequent in PsA as compared to both PS and control (26.8; 12.2; 6.7 %, correspondingly; $p_{1,2}$=0.07, $p_{2,3}$=0.02, $p_{1,3}$=0.7) and can be regarded as predictor of the formation of joint syndrome.
Cholestasis is causes by lesions in membranes of hepatocytes and bile ducts and is characterized by hyper cholesterinemia, hyper bilirubinemia, increased activity of alkaline phosphatase and gamma glutamyl transferase, phospholipids and bile acids in blood [18]. Having studied biochechemical markers of cholestasis we marked that patients in both groups show significantly increased levels of common bilirubin, AP, GGT in comparison with control. After the results of ultrasound screening the changes in liver ducts ($p_{1,3}$=0.00000001; $p_{2,3}$=0.000001) and thickening of gallbladder walls ($p_{1,3}$=0.02, $p_{2,3}$=0.004) are the signs of cholestasis, revealed in both PS and PsA. At the same time in PS the changes in ducts and focal liver formations (lesions) are more frequent as compared to PsA: 87.8 versus 68.7 % and 7.3 versus 0 % correspondingly; $p_{1,2}$=0.02; 0.02. High activity of cholestasis in PsA is confirmed by the presence of dyslipidemia, which is

characterized by the increased level of common cholesterol and changes in lipoprotein ratio in terms of the predominance of cholesterol of low density lipoproteins, as well as the increase of common bilirubin level [19].
The comparison between biochemical indices in PC patients' blood and in control didn't show any significant changes related to the content of direct bilirubin, ALT, LPLD cholesterol.
As a result of the research we found statistically meaningful differences between psoriasis and psoriatic arthritis patients in terms of the parameters of complete blood count (Table 3).

Table 3. Characteristics of the indices of complete blood count in psoriasis (PS) and psoriatic arthritis (PsA), Me (25 %; 75 %)

Indices of complete blood count	**PS (1) (n=77)**	**PsA (2) (n=98)**	**Control (3) (n=30)**	***p***
Leukocytes, 10^9cells /l	7.05 [5.8; 8.5]	7.7 [5.9; 9.8]	4.37 [3.5; 6.16]	$p_{1,2}$=0.05 $p_{1,3}$=0.000001 $p_{2,3}$=0.000001
Eosinophils, %	3.0 [1.0; 5.0]	3.0 [1.0; 5.0]	0.0 [0.0; 0.0]	$p_{1,2}$=0.9 $p_{1,3}$=0.000001 $p_{2,3}$=0.000001
Stab neutrophils, %	1.0 [1.0; 2.0]	2.0 [1.0; 2.0]	1.0 [1.0; 2.0]	$p_{1,2}$=0.04 $p_{1,3}$=0.4 $p_{2,3}$=0.01
Erythrocyte sedimentation rate, mm/h	7.0 [3.0; 14.0]	15.0 [7.0; 20.5]	6.0 [1.5; 13.0]	$p_{1,2}$=0.0005 $p_{1,3}$=0.3 $p_{2,3}$=0.0002

Note. Significance of differences (*p*) — Mann-Whitney criterion

In PS and PsA we revealed the changes in the parameters of peripheral blood associated with inflammatory process, which are characterized by the increased level of leucocytes in peripheral blood as compared to control. The level of leucocytes in peripheral blood is higher in PsA in comparison with PS, moreover we marked the tendency to the left shift of leukogram and the predominance of stab neutrophils. Besides, erythrocyte sedimentation rate in PsA is significantly higher than in PS.
In both PsA and PS patients as compared to control, we marked statistically meaningful increase of the content of eosinophils in peripheral blood, which can be considered as a sign of parasitic invasion being etiologic factor of HBS disease. So, lambliasis was more frequent in PsA and PS in comparison with control 24.0; 17.8 and 0 % correspondingly. The analysis of the frequency of total antibodies to *O.felineus, T.canis, T.spiralis*, *E.granulosus* antigens didn't reveal statistically meaningful differences between the PS/PsA and healthy subjects. In PS/PsA hepatitis C virus carrier state was found significantly more frequently as compared to control: 25.0; 5.5 and 0 % correspondingly. Frequency analysis for HbsAg didn't reveal any statistically meaningful differences between psoriatic disease cohorts and control.

DISCUSSION

SUMMARY OF THE PRIMARY RESULT OF THE RESEARCH

Functional changes in hepatobiliary system confirm polysystemic character of psoriatic disease, these changes correlate to the severity of psoriasis clinical course [13,20].

DISCUSSION FOR THE PRIMARY RESULT OF THE RESEARCH

To study causal associations between the disturbances of hepatobiliary system and psoriasis is actual task because liver is one of the main target organs, which are involved into systemic

psoriatic process [8,21]. The involvement of hepatobiliary system into the process negatively influences psoriasis course and correlates to the severity of clinical course of the disease [14,21]. In accordance with anamnestic data it has been proved that nutrition and psycho emotional factors play trigger role in regard to psoriasis and psoriatic arthritis [22]. In both psoriatic groups we revealed the presence of hepatocyte cytolysis, cholestasis and changes in peripheral blood associated with inflammatory process. Eosinophilia was revealed in some psoriatic disease patients, being probably the reflection of parasitic invasion, which influences biochemical structure and bile lithogenic properties with the formation of chronic cholecystitis [23]. The revealed carrier state in terms of hepatitis C in PS patients confirms the facts of close causal association between skin syndrome and liver parenchymal pathology, which had been determined previously [12].

As a result of our studies we revealed clinical functional predictors of psoriatic disease progression. We found that patients with psoriatic arthritis as compared to psoriasis are characterized by higher frequency of the signs of digestive tract diseases, gastrohepatic dyspepsia as well as anamnestic data related to digestive tract, hepatobiliary system and pancreatic gland diseases. In patients with joint syndrome we marked high activity of hepatocyte cytolysis, cholestasis, which allows to regard psoriatic arthritis as severe clinical stage of psoriasis. In this stage hepatobiliary system in its turn is one of the central target organs in systemic psoriatic process [8,15]. Hepatomegaly in psoriatic arthritis can be the consequence of liver fatty degeneration resulted from the disturbance of lipoid metabolism or it can be the reflection of systematicity of autoimmune inflammatory process in hepatocytes [13]. Besides psoriatic arthritis is characterized by the predominance of metabolic changes, associated with the disturbances of fat metabolism and changes in HBS functional state as well as the presence of the signs of local and systemic inflammation response [21]. The listed changes reflect the manifestations of non-alcoholic fatty liver disease, which is formed as a result of fat infiltration and focal inflammation of hepatocytes in the absence of alcohol overconsumption. So, liver non-alcohol fat diseases is risk factor for psoriatic arthritis development in psoriasis patients [24,25]. So, causal associations between the diseases of hepatobiliary system and clinical course of psoriasis and psoriasis arthritis have been confirmed by the presence of the changes in the main clinical laboratory and instrumental indices and are characterized by various manifestations, including functional disturbances, symptoms of non-calculous chronic cholecystitis, non-alcoholic fatty liver disease [21]. We marked the association between the severity of psoriatic process with hepatobiliary system diseases.

CONCLUSION

The findings of the given research are represented by the close casual associations between psoriatic disease and hepatobiliary system diseases. It was found that hepatobiliary system diseases precede to the progression of skin syndrome in PS and the formation of systemic signs in PsA. The study revealed the signs of duct and HBS parenchymal changes in both PS and PsA patients, which proves our hypothesis. So in psoriatic patients disregard to its severity, we revealed the signs of hepatocyte cytolysis, cholestasis, chronic cholecystitis. With the progression of psoriatic disease, the nosological structure and severity of liver and bile ducts diseases show the changes. So, psoriatic arthritis is accompanied by the increased frequency of hepatobiliary system diseases, high level of hepatocyte cytolysis, presence of metabolic changes, non-alcoholic fatty liver disease and polyvalent clinical signs of chronic cholecystitis. So non-alcoholic fatty liver disease and chronic cholecystitis can be presented as clinical anamnestic predictors of psoriatic disease progression.

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Conflict of interests

The authors report no financial or other conflict of interest relevant to the subject of this article.

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