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COMPARATIVE STUDY IN LEPTOSPIROSIS AND ACUTE VIRAL HEPATITIS

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SUMMARY:

Retrospectively have been studied clinical signs and routine laboratory investigations of patients with leptospirosis (n_1=94) and acute viral hepatitis (AVH) (n_2=1705). The comparison of results in two groups have revealed significant differences in the frequency of acute onset in leptospirosis and AVH with fever (respectively in 100% and 58,01%; p<0,005); pains in calf muscles (in leptospirosis in 85,11%, in AVH have not been observed); headache (resp. in 68,08 and 18,96%; p<0,005); anorexia (resp. in 64,89 and 87,36%; p<0,005); lumbar pains (in leptospirosis in 40,43%, in AVH have not been observed); clay colored stool (resp. in 6,38 and 93,60%; p<0,005); heaviness in abdomen (resp. in 3,19 and 84,38%; p<0,005); hepatic tenderness (resp. in 41,49 and 76,63%; p<0,005); conjunctival injection only in leptospirosis (86,17%). Routine laboratory investigations have been demonstrated anemia, leucocytosis, granulocytosis, increased erythrocytes sedimentation rate (ESR) and thrombocytopenia significantly often in leptospirosis than in AVH (p<0,005). The comparison of results of liver biochemical investigations have been established increased serum bilirubin in leptospirosis and AVH (resp. in 75,00 and 93,60%; p<0,05); mildly increased aminotransferases activities in leptospirosis and extremely increased in AVH (p<0,005); increased creatinkynase in leptospirosis; increased fibrinogen level in leptospirosis (av. 6,74 g/L), normal to decreased in AVH (av. 3,01 g/L) (p<0,005). Nitrogen parameters have been increased in leptospirosis with ARF.

Key words: leptospirosis, acute viral hepatitis, acute renal failure, liver biochemical parameters, creatinkynase, nitrogen parameters.

Leptospirosis at present is grossly underreported and a diagnostic dilemma because of its protean clinical manifestations. The spectrum of disease ranges from a mild inconsequential febrile illness to a severe fatal form presenting with multi organ failure conventionally called "Weil`s disease (1, 3, 6, 14). The variability in the course of leptospirosis causes diagnostic problems with broad spectrum of diseases such as acute viral hepatitis (AVH), hemorrhagic fevers, dengue fever, typhoid fever, malaria, sepsis, etc (1, 3, 4, 6, 14, 15). In our practice most often is needed to distinguish leptospirosis and AVH (2). AVH and leptospirosis have certain similarity in clinical symptoms and syndromes. Disorders in liver functions have been observed in both diseases; diagnostic problems are not rare (14, 15).

The **aim** of this research is a comparison of leptospirosis and AVH purposed to establishment of significant differences which could play role as diagnostic criteria in clinical practice.

MATERIALS AND METHODS:

Retrospectively have been studied clinical signs and routine laboratory investigations of patients with leptospirosis (n_1 = 94) and AVH (n_2 = 1705) treated in Clinic of Infectious Diseases at University Hospital – Pleven, Bulgaria.

RESULTS:

Acute onset has been presented in leptospirosis and AVH respectively in 100% and 58,01%. In leptospirosis often have been presented adynamia (90,43%), pains in calf muscles (85,11%), chills (78,72%), headache (68,08%), anorexia (64,89%), generalized muscle pains (52,13%). Anorexia (87,36%), adynamia (82,16%), myalgia (31,55%), chills (19,94%), headache (18,96%) have been observed in AVH. Nausea and vomiting have been presented equally in leptospirosis and AVH, respectively 88,30% and 89,03% (p>0,05). Hepatomegaly (91,49%) and splenomegaly (72,34%) have been found in leptospirosis; in AVH respectively 100% and 58,07%. Conjunctival injection frequently has been observed in leptospirosis (86,17%) but in AVH has not been occurred (p<0,005). The occurrences of clinical symptoms and syndromes in both diseases have been compared on Table 1 and Table 2.

Routine laboratory investigations have been demonstrated: leucocytosis (61,29%) with neutrophilia and left shift have been found in leptospirosis and ESR is increased in 95,12% (average 57 mm per hour; up to 140). Leucocytes have been established in normal range with prevalence of mononuclear cells, normal erythrocytes sedimentation rate (ESR) in 31,30%, moderately increased in 35,08% and extremely increased ESR only in 9,27% of cases with AVH.

Total bilirubin levels have been correlated with severity of both diseases with prevalence of direct bilirubin fraction. Average total bilirubin level in leptospirosis is 152,8 (in severe cases 281 мmol/L); in severe AVH 340 мmol/L. In leptospirosis the elevation of aminotransferases is mild to moderate and ASAT level is higher than ALAT (av. respectively 103 U/L and 94 U/L); increased aminotransferases activity have been correlate with severity of AVH (av. of ALAT ranges from 1730 to 3059 U/L) ($p<0,005$). Fibrinogen has been increased frequently in leptospirosis (in 81,01% of cases; av. 6,7 g/L); in AVH fibrinogen is usually normal and decreased levels have been measured in 17,00% of cases ($p<0,005$). Hypoproteinemia and hypoalbuminemia have been presented in severe AVH; in leptospirosis disorders have similar correlation with severity (av. of total protein 65,0 g/L, albumins – av. 37 g/L). Routine hemogram and liver biochemical parameters in both diseases have been compared on Table 3 and Table 4. Nitrogen parameters are increased often in leptospirosis (normal levels in mild course) up to extremely high levels in cases with acute renal failure (ARF) (av. blood urea nitrogen is 22,9 mmol/L, av. creatinine level is 297 мmol/L up to 1254 мmol/L). Electrolytic and metabolic disorders have been found frequently. In AVH increased nitrogen parameters have been measured only in severe cases with acute liver failure (ALF).

DISCUSSION:

Different etiology and pathogenesis of both diseases are in the ground of clinical differences. In leptospirosis generalized vasculitis is the major pathomorphological substrate which initiates multi organ disorders such as ARF, hemorrhagic syndrome, cardiovascular and pulmonary alterations (13). ARF is syndrome with greatest significance for severity of leptospirosis. In our research ARF has been presented in 38,30% of cases with leptospirosis. In AVH we have not observed severe ARF which is controversial with research of Montoliu et al. (1985) (9). Rhabdomyolysis causes muscular pains and contributes acute renal failure (7). Power marker for myocytic damage is creatinkynase which is elevated in leptospirosis (5, 11, 12). Liver disorders have been observed in both diseases but pathogenic mechanisms are different. In leptospirosis jaundice has complex genesis – centrilobular necrosis, microvascular liver disorders and cholestatic compound in absence of severe parenchymal injury which is frequently observed in AVH. ALF is rare complication in leptospirosis (4). These differences correlate with markedly different elevations of aminotransferases and characteristic for each disease changes in fibrinogen and prothrombin index (8, 10, 11, 12). The host immune response involves specific for each disease mechanisms which could explain different changes in routine hemogram in leptospirosis and AVH.

CONCLUSION:

Same clinical signs with different frequency and severity in both diseases have been presented. Investigations of leucocytes, ESR and liver biochemical parameters have been revealed significant differences. Nitrogen parameters have been increased often in leptospirosis; in AVH only in severe cases with acute liver failure.

Table 1. Clinical syndromes in leptospirosis and acute viral hepatitis

Symptoms and syndromes	leptospirosis %	acute viral hepatitis %	p
acute onset	100	58,01	<0,05
fever	100	58,01	<0,05
adynamia	90,43	82,16	>0,05
nausea and vomiting	88,30	89,03	>0,05
pains in calf muscles	85,11	-	<0,005
chills	78,72	19,94	<0,005
darkness of urine	78,72	93,60	>0,05
headache	68,08	18,96	<0,005
anorexia	64,89	87,36	<0,05
oliguria	56,38	-	<0,005
generalized myalgia	52,13	31,55	<0,05
abdominal pains	46,81	17,00	<0,05
lumbar pains	40,43	-	<0,005

hemorrhages	15,96	7,00	<0,05
diarrhea	13,83	-	<0,005
arthralgia	9,57	9,50	>0,05
photophobia	8,51	-	<0,005
clay colored stool	6,38	93,60	<0,005
heaviness in abdomen	3,19	84,38	<0,005

Table 2. Clinical syndromes in leptospirosis and acute viral hepatitis

Symptoms and syndromes	**leptospirosis %**	**acute viral hepatitis %**	**p**
hepatomegaly	91,49	100	>0,05
conjunctival injection	86,17	-	<0,005
splenomegaly	72,34	58,07	<0,05
jaundice	63,83	93,60	<0,05
tachycardia	53,19	-	<0,005
renal tenderness	52,13	-	<0,005
hypotension	47,87	76,63	<0,05
abdominal tenderness	43,62	30,37	<0,05
hepatic tenderness	41,49	76,63	<0,005
tachypnea	14,89	-	>0,05
dyspnea	11,70	-	>0,05
slowly peristalsis	8,51	-	>0,05
heart murmurs	7,45	-	>0,05
labial herpes	4,45	-	>0,05
rash	5,32	1,62	>0,05
hypertension	5,32	-	>0,05

Table 3. Routine hemogram in leptospirosis and acute viral hepatitis

Laboratory changes	**leptospirosis %**	**acute viral hepatitis %**	**p**
anemia	62,69	4,63	<0,005
leucocytosis	61,29	11,80	<0,005
granulocytosis	95,12	-	<0,005
lymphocytosis	-	14,56	<0,005
ESR – normal	4,88	31,30	<0,005
ESR – moderately increased	74,39	35,08	<0,005
ESR – extremely increased	20,73	9,27	<0,005
thrombocytopenia	58,62	10,30	<0,005

Table 4. Liver biochemical investigations in leptospirosis and acute viral hepatitis

parameters	leptospirosis%	average	acute viral hepatitis %	average	p
serum bilirubin	75,00	152,8	93,60	179	<0,05
ASAT	76,83	102,9	100	1564	<0,005
ALAT	75,28	94,2	100	2888	<0,005
alkaline phosphatase	76,47	331	72,33	413	>0,05
GGT	94,55	171	83,92	309	>0,05
creatinkynase	77,78	1736	-	-	<0,005
total protein	22,67	65,03	26,00	68	>0,05
albumins	45,45	37,41	40,00	40	>0,05
fibrinogen	81,01	6,74	-	3,01	<0,005
fibrinogen	1,27		17,00		<0,005
prothrombin index	33,33	85,6	56,00	55	<0,05

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