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HEMODIAPERFUSION IN LEPTOSPIROSIS

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ABSTRACT:

Comparatively have been studied laboratory parameters in severe cases of leptospirosis divided in two groups – with and without hemodiaperfusion (HD). The dynamical investigations of blood urea nitrogen (BUN), serum creatinine, and serum bilirubin levels reveal that hemodiaperfusion markedly decreases the levels of nitrogen parameters and is non effective for serum bilirubin. Hemodiaperfusion in oliguric phase of the acute renal failure of leptospirosis prevents brain edema and lung edema - significant tanatogenic factors.

Key words: hemodiaperfusion, leptospirosis, acute renal failure, blood urea nitrogen, serum creatinine, serum bilirubin.

Leptospirosis is an acute infectious disease with multiorgan disorders. Acute renal failure and impaired hepatic functions are important clinical syndromes requiring multidisciplinary approach in the treatment including hemodiaperfusion (HD) [1, 2, 4, 5, 6, 7, 8].

AIM of this study is evaluation of effects of HD in severe cases of leptospirosis.

MATERIAL AND METHODS:

Clinical and laboratory parameters have been studied retrospectively and prospectively in 84 cases with leptospirosis treated in Clinic of Infectious Diseases – Pleven (1982 to 2004).

RESULTS AND DISCUSSION:

Using clinical and laboratory criteria characteristic for renal, hepatic, cardiovascular disorders and hemorrhagic syndrome has been evaluated the severity of the observed cases. Mild course (serum creatinine level below 200 µmol/L) in 52,38% of cases, moderate (serum creatinine level between 200 and 600 µmol/L) in 19,05%, and severe course (serum creatinine level above 600 µmol/L) in 28,57% have been established. The mortality is 14%. The illness is with acute onset with fever above 38ºC (100%), nausea with vomiting and diarrhea (86,90% and 21,43%, respectively), and oligoanuria (75%).

The physical examination reveals hepatomegaly (100%), splenomegaly (100%), jaundice (75%), cardiovascular disorders – tachycardia (59,52%), hypotension (33,33%), toxical myocarditis (20,24%), cardiac arrhythmias (11,90%); hemorrhagic syndrome (30,95%), and pulmonary disorders (19,05%). Stiffness occurs in 11,90%.

Routine laboratory parameters: leucocytosis in 73,81% (av. 14,9 . 10^9/L) with neutrophilia and left shift of granulocytes in 97,62%, increased erythrocytes· sedimentation rate in 86,90% (av. in first hour 51 mm), anemia in 73,81%, thrombocytopenia in 42,86%, increased fibrinogen in 73,81% (av. 6,4 g/L). Decreased total protein (in 29,76%; av. 65,4 g/L), and serum albumins (44,05%; av. 37 g/L) have been established.

Blood urea nitrogen (BUN) level above 8,3 mmol/L is established in 80,95% of cases (av. 26,1 mmol/L), and serum creatinine level above 135 µmol/L - in 72,62% (av. 303,2 µmol/L; with range from 74 to 860 µmol/L). The serum bilirubin level is elevated in 70,24% (av. 167,9 µmol/L). Serum transaminases levels are moderate elevated in 73,81% and range from normal to 382 U/L (av. 92 U/L).

The patients have been treated with penicillin (94,05%), ceftriaxon (5,95%), in 11,90% of cases second antimicrobial course with zinacef or cefperazone. Pathogenical treatment includes adequate of urine output infusions of fluids (100%), corticoids (48,81%), diuretics (75%), and transfusion of blood products (52,38%). Hemodiaperfusion in oliguric phase of acute renal failure is administered in 19,05% of cases (32% of severe cases).

Dynamically are compared the followed laboratory parameters:

Table 1. BUN levels in group without and group with HD.

BUN (mmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD	37	40	28
with HD	39	44	30
p	> 0,10	>0,10	>0,10

Table 2. BUN levels in survivors and fatal cases (compared averages between cases without and with HD).

BUN (mmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD-survivors	31	32	17
without HD-fatal cases	43	52	63
p	> 0,10	> 0,01	< 0,01
with HD-survivors	39,6	42,5	6,6
with HD-fatal cases	39	45,7	61,1
p	> 0,10	> 0,01	< 0,01

Table 3. Serum creatinine levels in group without and group with HD.

creatinine (μmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD	376	418	196
with HD	685	603	314
p	< 0,001	0,10>p>0,05	> 0,10

Table 4. Serum creatinine levels in survivors and fatal cases (compared averages between cases without and with HD).

creatinine (μmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD-survivors	387	420	98
without HD-fatal cases	362	416	371
p	> 0,10	> 0,01	< 0,001
with HD-survivors	767	628	115
with HD-fatal cases	604	578	580
p	< 0,05	> 0,10	< 0,001

Table 5. Serum bilirubin levels in group without and group with HD.

bilirubin (μmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD	224	332	206
with HD	352	549	383
p	> 0,10	> 0,10	> 0,10

Table 6. Serum bilirubin levels in survivors and fatal cases (compared averages between cases without and with HD).

bilirubin (μmol/L)	admission (av.)	in course (av.)	finally (av.)
without HD-survivors	194	522	69
without HD-fatal cases	306	455	455
p	> 0,10	> 0,01	< 0,05
with HD-survivors	314	826	37
with HD-fatal cases	390	479	844
p	> 0,10	> 0,01	< 0,01

CONCLUSION:

HD in severe leptospirosis markedly decreases serum creatinine level and is not effective for serum bilirubin level. The early administration HD is especially benefit – reduces the risk for complications (brain edema and lung edema) and decreases mortality [1, 5, 7, 8].

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