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HEPATIC AND RENAL SUPPORT IN CASE OF SEVERE LEPTOSPIROSIS – WEIL SYNDROME

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ABSTRACT. The Weil Syndrome occurs on very rare occasions and is due to infection with leptospirosis. A 43 year old male patient, admitted in ICU, presenting clinical picture of acute hepatic failure and the lab findings revealed sepsis and renal failure, underwent the procedure of artificial hepatic support and continuous renal support with an additional adsorber. These procedures allowed the favorable evolution of the patient and could be used, in the future, as an efficient treatment in case of hepatic failure, regardless of the underlying cause.
KEY WORDS: leptospirosis, sepsis, acute hepatic failure, renal failure

INTRODUCTION

Leptospirosis is a rare infectious disease in Romania. It is a spirochetal zoonosis caused by pathogenic Leptospira species.[1,3]

Human leptospiral infection results primarily from exposure to the urine of infected rats. Leptospires can then contaminate humans through cuts and abrasions of the skin, through intact mucous membranes (nose, mouth, eyes) and perhaps through waterlogged skin. The disease presents with complex clinical features varying from subclinical infection and self-limiting anicteric illness, to hemolytic –icter form and to multiple-organ failure known as Weil's disease, which eventually could led to death[2,4,5]. The most frequent organs involved, in this severe form of disease , are the liver and the kidney[6,7].

Antibiotics should be initiated as soon as the diagnosis is suspected, Ampicilin being the mainstay of antibiotherapy and it is still recommended by the majority of physicians [8].

In case of severe acute kidney injury (AKI) and acute hepatic failure (AHF), there is no consensus on the best method of dialysis, but the tendency is to propose the earliest and most efficient therapy available [9,10,11].

In this paper, we report such a severe case and its management.

MATERIAL

We report a case of a patient who had on admission the following clinical picture:

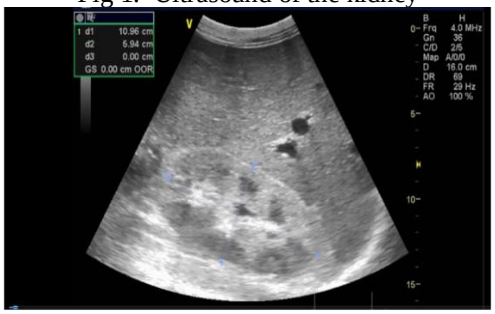
The presence of jaundice and multiple haematomas on the skin, the patient was in coma with Glasgow Scale Score (SCG) of 7 (ocular response -2, verbal response -1, motor response – 4), and had additional convulsive syndrome, particularly localized in the superior region of the legs. Hemodynamic the patient was stable with blood pressure = 110/60mmhg, heart rate = 95bpm, the patient had only a slight increase in respiratory frequency and the diuresis was in normal range.

The lab findings concerning this patient on admission are presented bellow:

Leucocytes = 39,230 with neutrofiles at 84% Plachetes = 132.000, Hemoglobin = 6g/dl, Hematocit = 17%, Quicke Index = 86%, Rational Normal Index =1.09, Activated Protrombin Time = 36 sec, lactic acid =1,9 mmol/l, the procalcitonin value = 5,2ug/dl, glicemia =98 mg/dl, albumin = 2,6g/dl, the plasmatic cholinesterases = 3300u/l, the hepatic transaminases = 88u/l and 44u/l, phosphate alkaline = 105u/l, gamaglutamiltransaminasis = 50u/l, blood urea nitrogen = 239 mg/dl, the creatinin value = 3,2mg/dl, total bilirubin = 42mg/dl, direct bilirubin = 42 mg/dl.

The abdominal ultrasonography of the patient is presented below, it can be observed an increase in the size of the liver (fig 2)

Fig 1. Ultrasound of the kidney



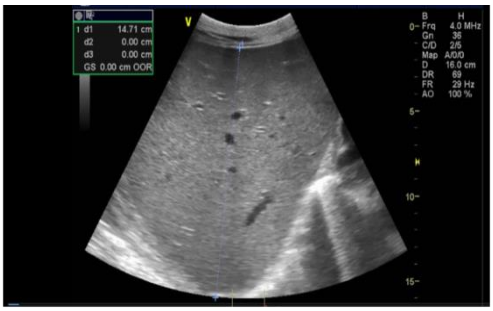


Fig 2. Ultrasound of the liver

Based on clinical picture and lab findings the diagnosis of the patient was:

Severe sepsis, Coma gr.II, Convulsive Syndrome, Severe Hepatic Dysfunction, Acute renal injury, Hypoalbuminemia, Severe syndrome of anemia, Multiples subcutaneous hematoma.

METHOD

The method which could be used in order to achieve an appropriate renal and hepatic support is the most important issue of this clinical case. Out of all methods used, three of them could be employed in this case:

-Plasmapheresis for hepatic support;

-Continuous veno-venous hemodiafiltration for renal support;

-Continuous venovenous hemodiafiltration with an adsorber for renal and hepatic support.

Beside the extrarenal procedures which were taken into account from the first day, the patient was put on therapy consisting in: -volemic therapy (saline and colloid solution), Arginin solution -500ml/24h, antibiotherapy – ertapenem 1g/day while the blood sample was drawn and sent in for leptospirosis test. After two weeks, we get the confirmation of leptospirosis and Ertapenem was replaced by Ampicilin 2g every 6h. In the same time the patient was given Ornitin-aspartat 1ampoule every 12 h, Manitol 20% 100ml every 6h and the correction of anemia and hipoalbuminemia with blood transfusion and hiperoncotic albumin solution. For the stress ulcer and venous thrombo-embolism prophylaxis were introduced in the patient's treatment Arnitin 50mg every 12h and Fraxiparin 0,6 ml subcutaneous.

The first procedure employed was the extrarenal support, considering the very high value of renal lab values, which were regarded as life-threatening. The patient underwent continuous venovenous hemodiafiltration (CVVHDF), using femoral venous access, Oxiris filter, systemic anticoagulation with heparin and the total dose of 30ml/kg/h in filter chamber, were used. During the treatment, the patient suffered superior digestive bleeding and simultaneous subcutaneous hematoma, for these reasons the dose of heparin had been decreased, subsequently the filter blocked. This tendency to bleeding is explained mainly by the hemorrhagic diathesis caused by vascular wall distress, which occurs in case of Weil syndrome.

Fig 3. Thoraco-abdominal subcutaneous haematoma

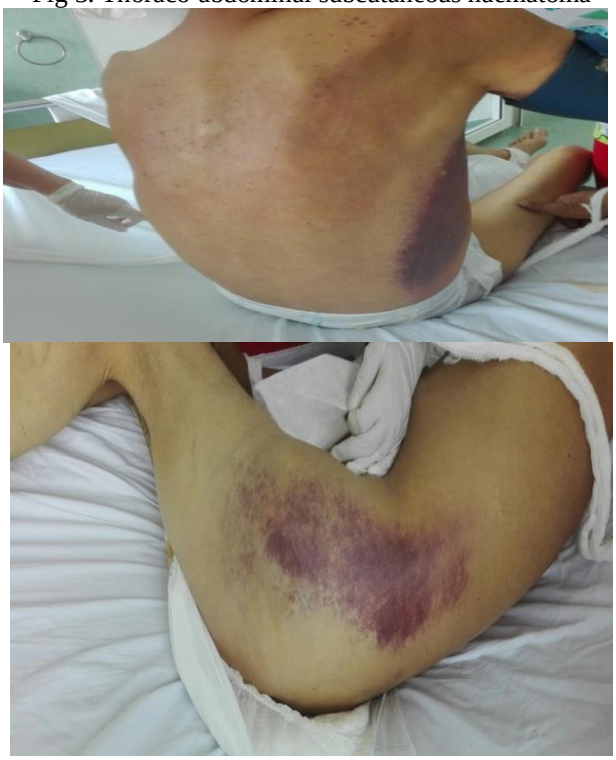


Fig 4. Subcutaneous haematoma of the left leg.

The second procedure, employed 48h after the first one, was plasmapheresis which was used only for hepatic support, having the same femoral vascular access. It was accomplished a total of 3500ml plasma exchange treatment using a lower dose of heparin. The first three exchanges of the treatment were based on plasma-exchange while the last one of these was done with albumin solution.

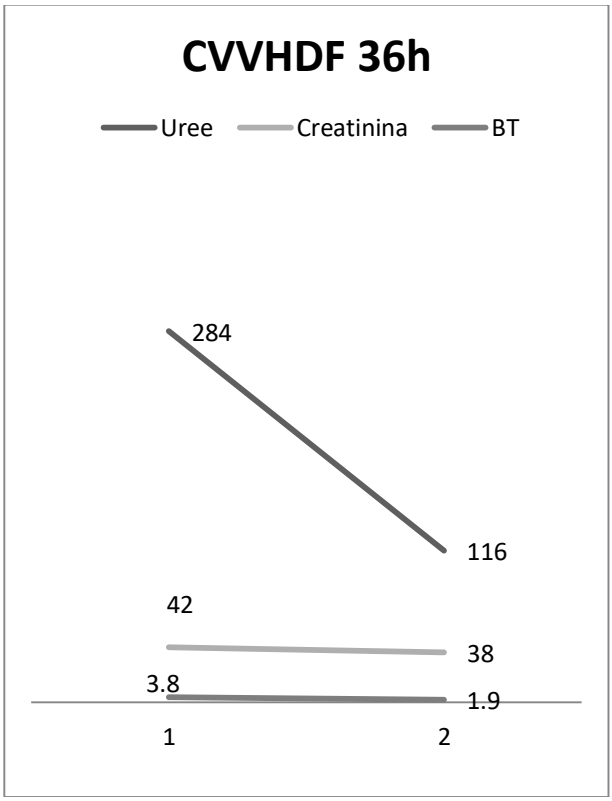
The third procedure, 48h after the second one, was again HDFVCC, using the same parameters as the previous one, but this time, the adsorber - Cytosorb was added to the filter in order to perform a good plasmatic epuration of the hepatic toxins, starting from bilirubin which has the lowest molecular mass of this group of substances.

Fig 5. Prismaflex used for CVVHDF with cytosorb

RESULTS

Regarding the lab values which are related to the renal function (BUN and CREAT) and the lab values which are related to hepatic function (BIL.T), the graphics below clearly describe the changes of these values. It is also important to observe the clinical evolution of the patient after each procedure, and to reveal the impact of these procedures on clinical evolution. The clinical status of the patient is presented after each procedure used.

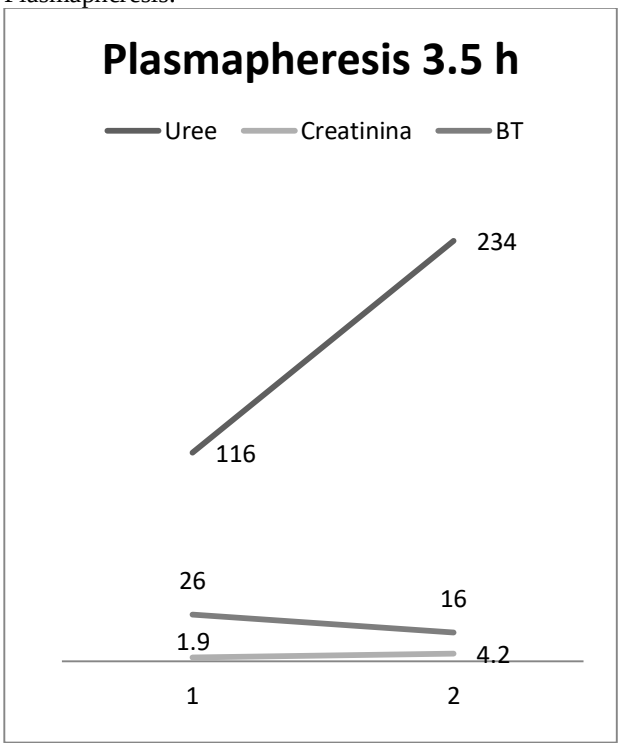
Continuous venovenous hemodiafiltration :



Graphic 1. The renal measurements and bilirubin plasmatic concentration during CVVHDF

The clinical status of the patient at the end of the procedure - the patient was comatose with SCG=8, hemodynamic and respiratory status were stable with the diuresis more than 1000ml/day.

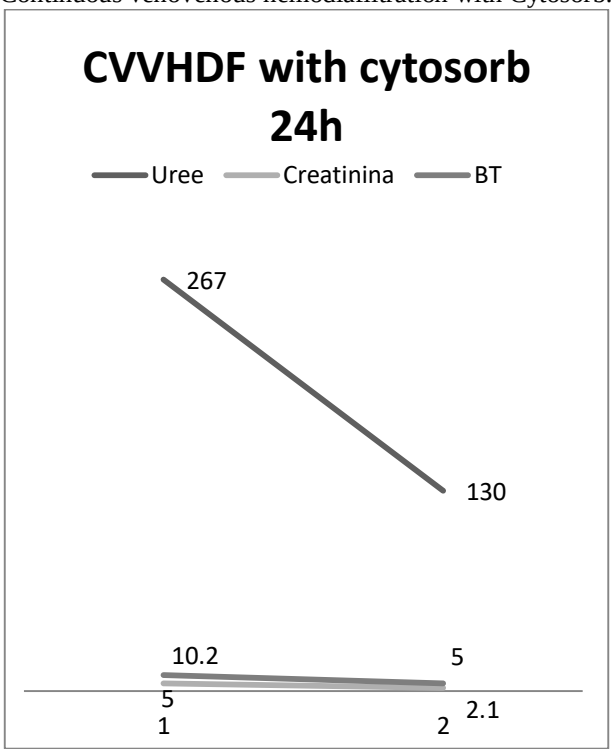
Plasmapheresis:



Graphic 2. The renal measurements and bilirubin plasmatic concentration during plasmapheresis

The clinical status of the patient at the end of procedure- the patient was alert with SCG-13, hemodynamic and respiratory status were stable, the diuresis in normal range.

Continuous venovenous hemodiafiltration with Cytosorb.



Graphic 3. The renal measurements and bilirubin plasmatic concentration during CVVHDF with cytosorb.

The clinical status of the patient at the end of the procedure was very good, the patient was able to eat and stand on the bed.

CONCLUSION

The artificial procedures of hepatic and renal support were the mainstay of the patient's treatment, due to these techniques, the patient could have a favorable clinical evolution, being discharged from the ICU ward 14 days after admission and 5 days after the last procedure.

Regarding the renal support, the CVVHDF technique is used on a wide scale throughout the world's ICU for renal support. By adding a Cytosorb to the filter, during the same treatment, both renal and hepatic support can be accomplished.

Regarding the artificial hepatic support, the first procedure which was historically introduced in medical practice is plasmapheresis. It is still the main procedure used in case of hepatic failure due to its simplicity and the good results achieved.

The combination of the techniques described in this case, Plasmeferesis and CVVHDF with Cytosorb, could be an efficient treatment for both renal failure and hepatic failure, in association or standing alone.

Some authors consider this combination as an alternative to hepatic dialysis using albumin solution (MARS), a more expensive procedure which can be used only on small scale.

BIBLIOGRAPHY

1. Centers for Disease Co2. Centers for Disease Control and Prevention, author. Leptospirosis. 2015. Retrieved fromhttp://www.cdc.gov/leptospirosis
2. S. Visith, P. Kearkiat.Nephropathy in leptospirosis.J Postgrad Med, 51 (2005), pp. 184-188
3. A.R. Bharti, J.E. Nally, J.N.l. Ricaldi.Leptospirosis: a zoonotic disease of global importance.Lancet Infect Dis, 3 (2003), pp. 757-77
4. E. De Francesco, K.L. Daher, G.B. Soares de Abreu, J. Silva.Leptospirosis-associated acute kidney injury. J Bras Nefrol, 32 (2010), pp. 400-407
5. R. Moretti, S. Scarrone, B. Pizzi, V. Bonato, N. Vivaldi.Coupled filtration plasma-adsorption in Weil's syndrome: case report. Minerva Anestesiol, 77 (2011), pp. 846-849
6. R.C. Abdulkader, M.V. Silva.The kidney in leptospirosis.Pediatr Nephrol, 23 (2008), pp
7. L. Andrade, E. de Francesco Daher, A.C. Seguro.Leptospiral nephropathy.Semin Nephrol, 28 (2008), pp. 3
8. T. Panaphut, S. Domrongkithaporn, A. Vibhagool, B. Thinkamrop, W. Susanengrat.Ceftriaxone compared with sodium penicillin G for treatment of severe leptospirosis. Clin Infect Dis, 36 (2003), pp. 1507-151
9. Li Cavoli g,Totorici C,Bena L et al.Acute renal failure in Weil"s Disease .Dialisisy transplante 2013 ;34:33 ,5
10. IttyachenA.,Krishnopillai T,Nair M,Rojou A. retrospective study of severe cases of leptospirosis admitted in the intensive care unit J PostMed.2007 ;53:232-5
11. Pappas G,Genia A Optimal treatment of leptospirosis :queries and projections INt.J.Antimicrob. Agents 2006;28:491-6