PROMETHEUS LIVER SUPPORT THERAPY IN HUNGARY

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INTRODUCTION AND AIMS:

Liver failure carries a high mortality, both the acute type with no pre-existing liver disease (acute liver failure, ALF), and the acute decompensation superimposed on a chronic liver disorder (acute on chronic liver failure, ACLF). Today, liver transplantation (TX) still represents the only curative treatment for liver failure due to end stages liver diseases. Because of organ shortage in liver transplantation a significant number of patients dies on waiting list. In order to diminish the mortality, various trials were introduced to remove the albumin-bound and water-soluble toxins in liver failure with the aim to support the spontaneous regeneration of the liver, or keeping the patients alive until liver transplantation. Prometheus® treatment is a relatively new technique based on Fractionated Plasma Separation and Adsorption (FPSA) combined with a high-flux dialysis. During the procedure the patient's own separated albumin-rich plasma passes through special adsorbents making possible the elimination of albumin-bound toxins (Fig.1). Liver support therapies were introduced in 2005 in Hungary, and since January 2013 they have been covered and reimbursed by the Hungarian National Health Insurance Authority.

In this study we assessed the efficacy of Prometheus liver support therapy and its benefit on patient survival.

Age/Gender	Year	N	Tipe of organ failure	Ethiology	Outcome
43/f	2005	3	ALF	Paracetamol poisoning	recovered
21/f	2006	2	ALF	Potassium permanganate poisoning	recovered
40/f	2006	5	ALF	Mushroom poisoning	recovered
4/f	2006	4	Primary graft failure	Liver TX due to acute hepatitis E	bridging to TX***
44/m	2006	3	ACLF+AKI	HCV, cirrhosis hepatis	exitus
56/m	2008	2	Primary graft failure	Liver TX due to hepatitis C	bridging to TX
47/m	2008	1	ALF+AKI	NHL*, Stem cell TX, sepsis	exitus
51/f	2009	6	ACLF,	Autoimmune hepatitis, cirrhosis hepatis	exitus
45/f	2010	6	ALF	Autoimmune hepatitis + poisoning (Cimicifuga racemosa)	exitus
56/m	2010	4	ALF	NHL*, hepatitis B virus reactivation	exitus
22/m	2012	8	ALF	HBV+ delta agent infection	exitus
60/f	2013	2	ALF,	Autoimmune hepatitis	exitus
31/m	2014	2	Chrn. graft failure	2008. liver TX due to PSC**	bridging to TX
25/m	2014	2	ACLF	Wilson disease	bridging to TX
30/m	2014	1	ALF+AKI	Unknown ethiology	exitus
43/m	2014	2	ALF+AKI	Mushroom poisoning	exitus

*NHL=Non Hodgkin lymphoma
**PSC=Primary sclerosing cholangitis
***Exitus after TX

Table 1.

PATIENTS AND METHODS:

Between May 2005 and August 2014 Prometheus Liver Support was employed for 16 patients (mean age: 39 years, max: 60, min: 4 years, ratio M/F: 9/7, number of treatments: 53). Among the patients: 10 had ALF, 3 ACLF, 3 Liver graft failure (1 chronic rejection and 2 primary graft dysfunction). Liver failure was accompanied by stage 3 acute kidney injury (AKI) in 4 patients. The detailed patient data can be seen on table 1. Anticoagulation was performed with heparin sodium, citrate-calcium (Ci-Ca), epoprostenol sodium, antithrombin III, or with various combinations of them. Student's t test was used to analyze the data.

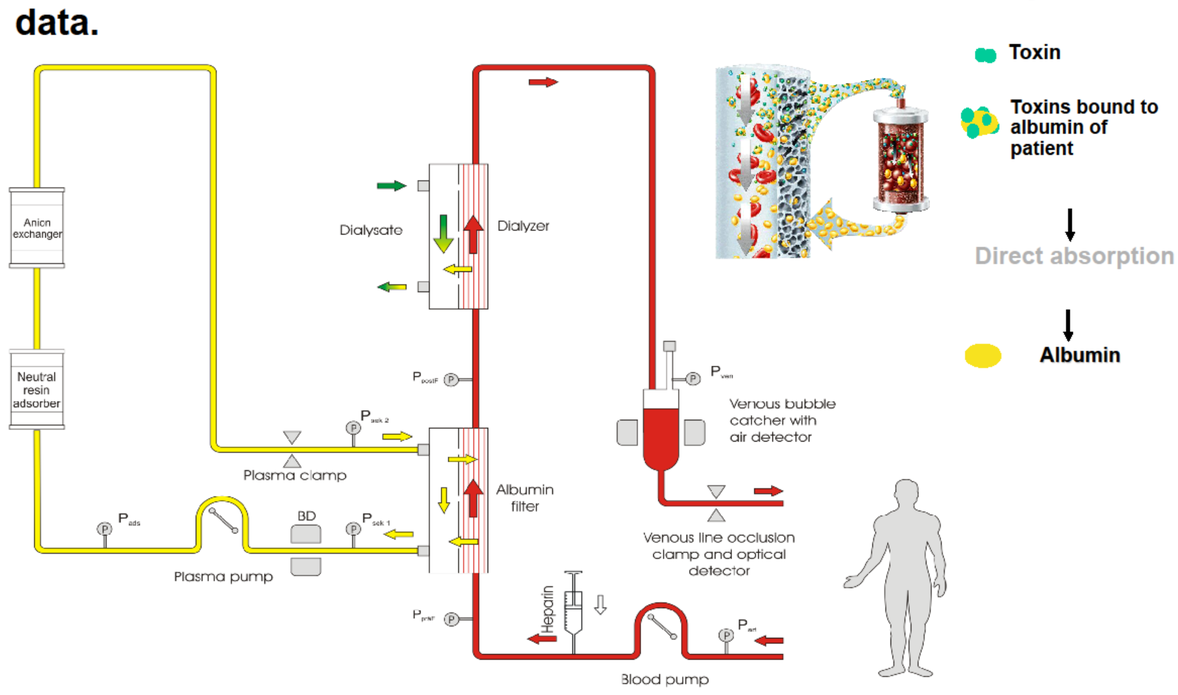

Fig. 1.

RESULTS:

Total-, conjugated- and non-conjugated bilirubin (Bi), ammonia, urea, se kreatinin and bile acid levels showed highly significant decrease during the treatments (Fig. 2-8).

Seven patients (43,75 %) survived, 4 via bridging to liver TX (but one of them died after TX) and 3 recovered.

Mean survival time without transplantation or regeneration was 8 days with minimum of 1 day and maximum of 22 days.

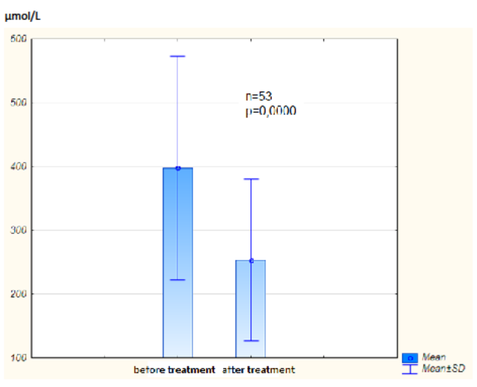

Fig. 2.
Change of total Bi during the treatment

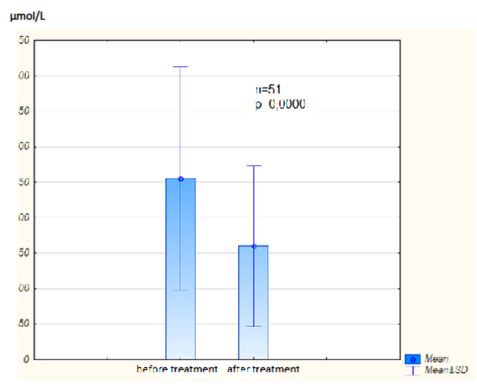

Fig. 3.
Change of conjugated Bi during the treatment

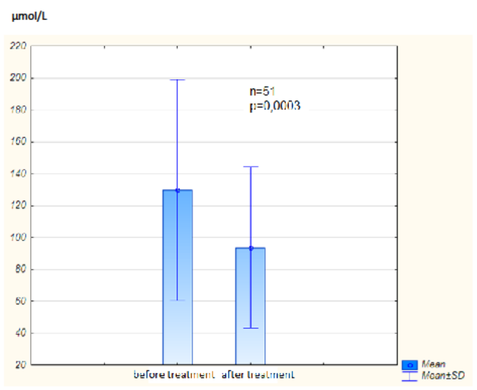

Fig. 4.
Change of non-conjugated Bi during the treatment

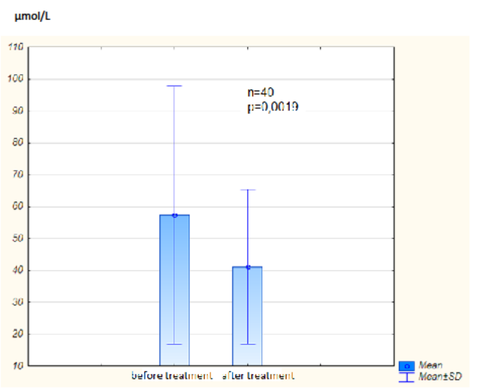

Fig. 5.
Change of ammonia during the treatment

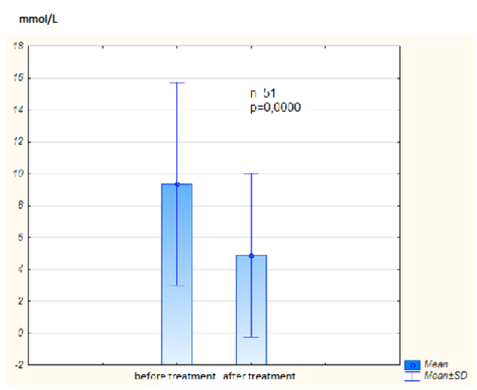

Fig. 6.
Change of urea during the treatment

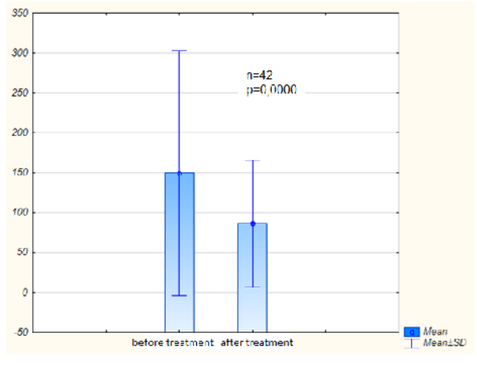

Fig. 7.
Change of se kreatinin during the treatment

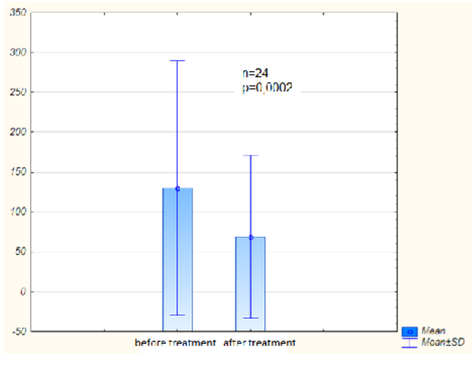

Fig. 8.
Change of bile acid during the treatment

CONCLUSIONS:

We conclude that Prometheus Liver Support is an efficient therapy of liver failure providing bridging time until liver transplantation or regeneration of liver parenchyma occurs.

Further follow up is needed to confirm the extent of the benefits of liver support.

References:

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