RE-EXPLORE THE ROLE OF ARTIFICIAL LIVER SUPPORT SYSTEM (ALSS) DURING COVID-19 PANDEMIC

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Background:

Coronavirus Disease-19 (COVID-19) had been declared as pandemic since 11 March 2020 and there was an exponential increase of cases in Malaysia since mid-March 2020.[1] The outbreak had inflicted major disruption in the healthcare service and transplantation had been suspended temporarily due to logistic reasons and scarcity of resources. Todate, liver transplantation is the only effective therapeutic option with proven survival benefits in irreversible acute liver failure (ALF). The role of ALSS in ALF is controversial but it provides an alternative to remove the endogenous toxin and inflammatory mediators while waiting for the definitive treatment. We would like to report the application of ALSS as bridging therapy in 2 patients with ALF during the interruption of transplantation service due to the pandemic.

Method/Case Presentation:

Case 1:
A 24-year-old lady was admitted for ALF due to anti-tuberculosis agents which were started for tuberculous lymphadenitis. She was intubated for airway protection as encephalopathy ensued with multiple episodes of seizures. Her MELD score was 37 and we could not facilitate the liver transplantation from the other centre due to the pandemic. Haemoperfusion (Jafron HA330-II) was initiated and showed biochemical improvement but nothing from the clinical aspect (Bilirubin 312 to 240 µmol/l, Interleukin-6 (IL-6) 208.5 to 92.3 pg/ml). Subsequently, single pass albumin dialysis (albumin 2% with dialysate flow rate of 700mL/hour for 6 hours) was attempted but was withdrawn due to severe coagulopathy and she succumbed secondary to hospital acquired infection.

Case 2:
A 26-year-old indian citizen was admitted for ALF secondary to alcoholic hepatitis with a MELD Score of 40. He was monitored closely while the family was arranging for the medevac service back to India for liver transplantation. The transfer required intricate legal documentation during the pandemic and we had started 3 cycles of haemoperfusion to buy time. We were able to wean off his inotropic support (Intravenous infusion of noradrenaline 0.6 mcg/kg/hour) with stabilization of liver parameters before his transfer (Bilirubin 619 to 461 µmol/l, Ammonia 92 to 57 µmol/l).

	Case 1		Case 2	
	Pre HP	Post HP	Pre HP	Post HP
Ammonia (µmol/l)	73	81	92	57
Bilirubin (µmol/l)	312	240	619	462
IL-6 (µmol/l)	208.5	92.3	N/A	N/A
IL-8 (µmol/l)	99	592	N/A	N/A

Table 1.
Comparison of blood parameter before and after haemoperfusion

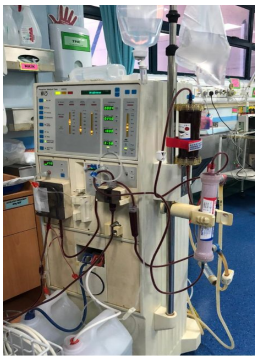

Diagram 1.
High flux haemofilter with Jafron HA 330-II

Conclusion:

ALSS involves extracorporeal blood purification technique and this includes molecular adsorbent recirculating system (MARS), SPAD, plasma exchange and haemoperfusion. It can be considered as one of the therapeutic options as bridging therapy while waiting for liver transplantation especially during this pandemic. Jafron HA-330 II is effective in removing serum ammonia, cytokines and bilirubin in Hepatitis B patients from a retrospective study.[2] However, our case series are unable to conclude due to the limited number of patients. Nevertheless, patient selection, the appropriate timing for initiation and the frequency of treatment warrants future study.

References:
1) WHO Director-General's opening remarks at the media briefing on COVID-19 on 11 March 2020.
2) Hu XB et al: The use of HA330-II microporous resin plasma adsorption in the treatment of chronic severe hepatitis. Zhongguo Wei Zhong Bing Ji Jiu Yi Xue 2007; 19: 760–771.

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