



MARS (Molecular Adsorbent Recirculating system)- As a life saving Modality of Treatment

Author

Dr Ashok Kumar, MD (MED)

Assistant Professor, Medicine, Department of Nephrology, P.M.C.H. Patna, Bihar, India

There are different modalities of Haemodialysis

1. Intermittent Haemodialysis (IHD) TYPICALLY RUNS FOR 3-4 hrs per session and is performed three times weekly. Outpatient in centre haemodialysis for ESRD generally subjected to this modality.
2. Continuous Renal Replacement Therapy (CRRT) can be used in haemodynamically unstable patients who can't tolerate the rapid fluid shifts of IHD. Most frequently employed form of CRRT is continuous veno venous haemofiltration (CVVHDF).
3. Sustained low efficiency dialysis (SLED) is essentially a hybrid form of IHD and CRRT.
4. Molecular Adsorbent Recirculating System (MARS) is a liver support device used in hepatorenal syndrome.

MARS is a uniquely designed system in which there are two dialysate. In one dialysate patient blood is in counter current with human albumin. Albumin act as dialysate fluid in this dialysate and in other dialysate this albumin is in counter current with the normal dialysate fluid, which we use for normal haemodialysis. Now albumin in

first dialysate taken impurities from patient blood and goes towards the second dialysate, in the midway it regenerate itself passing through ion exchange and activated charcoal chamber. Albumin carries all the impurities including protein bound like bilirubin and gives it to ion exchange and activated charcoal chamber and then continues its journey towards the second dialysate. In the second dialysate all the water soluble impurities like creatinine and urea which are albumin and are exchange with normal haemodialysis fluid. Thus MARS dialysis takes care of both the toxins, generated due to mal functions of liver and kidney simultaneously.

MARS is indicated to remove protein-bound and/or water toxins from the blood. Primarily in patient with acute or chronic liver failure, frequently accompanied by endogenous intoxication, jaundice (icterus) or comatose conditions. As with haemodialysis, no absolute contraindication for the MARS treatment are known when applied for a life saving instantaneous therapy.

During MARS treatment a lowering of the medication level must be anticipated, particularly for albumin-bound drugs. Therefore, these drugs should preferably be given after end of the

treatment, or the dosage should be adjusted to accommodate the altered liver kidney activities.

Till now MARS is used as bridging modality of treatment for patient of chronic liver failure that are in hepatorenal syndrome and waiting liver transplant. We have use this modality of treatment, for patient who has acute liver and kidney failure in our center.

We have got some amazing results after single session of MARS. Patients serum bilirubin came down to

1.1mg/dl from 17.7mg/dl after 8hrs of MARS. Same is the case with serum creatininel, it came down to 2.7mg/dl from 9.2mg/dl.

We usually don't had answer for the ailments in which both kidney and renal function with compromised but now MARS is the answer that we have for these kinds of ailments like complicated malaria, septicemia induced acute liver injury and acute kidney injury.

We have put 15 patient on MARS from 20th July 2011 to 8th Oct 2012 in the department of Nephrology PMCH (Patna Medical College Hospital) patna and 10 out of which were due to acute liver and kidney failure due to various reasons and 5 are chronic liver disease patient who were in hepatorenal syndrome. All the 10 are well now. Thus MARS is life saving in these patients.

References

1. Avilés J, Macía M, Morales S, Pérez F, Moreno A, Navarro J, et al. Eficacia de la diálisis con albúmina en el tratamiento de los pacientes con insuficiencia hepática avanzada: primera experiencia en España con el sistema MARS. *Nefrología*. 2001;21:376-85.
2. Heemann U, Treichel U, Loock J, Philipp T, Gerken G, Malago M, et al. Albumin dialysis in cirrhosis with superimposed acute liver injury: a prospective, controlled study. *Hepatology*. 2002;36:949-58
3. Jalan R, Sen S, Steiner C, Kapoor D, Alisa A, Williams R. Extracorporeal liver

support with molecular adsorbents recirculating system in patients with severe acute alcoholic hepatitis. *JHepatol*. 2003;38:24-31.

4. Herrera ME, Sèller G, Muñoz A, Muñoz A, Lebrón M, Aragón Cl. Soporte hepático extracorpóreo: situación actual y expectativas de futuro. *Med Intensiva*. 2004;28:211-8.
5. The washington manual of medical therapeutics 34th edition.
6. Harrison's principles of internal medicine 18th edition.vol 2.