

INTRODUCTION

➔ In order to overcome the disadvantages of hemodialysis with bicarbonate (HDB), several techniques of renal replacement therapy have been developed.

➔ These techniques have not become widespread because of their high costs.

➔ Thus, was born the idea of developing a technique that would improve the safety of HDB without raising the cost.

➔ This technique was called biofiltration free acetate with substitution of sodium bicarbonate at 84% (BSA at 84%).

TECHNIQUE PRINCIPLES

OF THE BSA AT 84%

➔ The BSA 84 % is a dialysis technique using a bath-free buffer (acetate or bicarbonate).

➔ The correction of metabolic acidosis of patients is ensured by providing a molar sodium bicarbonate (84 %) solution at the venous bubble trap in extra corporeal blood circuit.



➔ The generator used is the same as in HDB.

➔ The injection of buffer solution is provided by an infusion pump with adjustable flow.

➔ The flow rate used is about 3.5 to 4.5 ml / kg / hour.

➔ The volume injected during 4 hour session varies between 900 and 1000 ml.

➔ This volume is ultrafiltered through a dialyzer membrane in addition to the desired weight loss. Therefore, it is possible to use the same filters as for HDB.

➔ The dialysis concentrate used in the technique of BSA at 84% is a mixture of sodium chloride, potassium, calcium and magnesium, packaged in cans of 5 or 10 liters.

➔ During a dialysis session of 4 hours, the amount of concentrate used varies between 4 to 5 liters.

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ADVANTAGES AND DISADVANTAGES OF THE TECHNIQUE OF BSA AT 84 % COMPARED TO THAT OF THE HDB

➔ Since the first preliminary works of Debure in 1992 and Hmida in 1997, several studies have been conducted to analyze the costs and benefits of BSA at 84 % technique. It seems from these studies that this technique:

☐ **Improve clinical tolerance, reducing the frequency of hypotension and other clinical manifestations of intolerance:**

✓ This advantage is observed in both patients with acute renal failure and in chronic dialysis patients.

✓ The reasons for this increased tolerance of BSA at 84 % are: absence of acetate in the dialysate, reduced production of endotoxins in the dialysate and better response to ultrafiltration secondary to maintaining good plasma osmolarity per dialyse.

✓ This last factor, the better hemodynamic tolerance, may predispose to hypertension if we do not revise downward the concentration of sodium in the dialysate in some patients.

☐ **A good correction of metabolic acidosis, in both short and long term, without the risk of post dialytic hyperbasemie:**

✓ It is most probably related to the balance established during the meeting between intake and elimination of bicarbonate by the filter and richness in the dialysate chloride ion at the origin of a better correction of metabolic acidosis in intracellular transfer of bicarbonate in intracellular extracellular sector.

✓ However, the likely benefits of hyperchloremia should not lose sight of its deleterious effects: acidosis, hemolysis and extracellular medium.

✓ Moreover, the risk of hyperbasemia is not zero if the molar volume of infused bicarbonate is greater than 4.5 ml / kg / hour.

☐ **A lower cost compared to the technique of HDB:**

✓ The difference is due to the lower cost of the concentrate for biofiltration in comparison with concentrated acid (The latter contains in addition to acetic acid). Also, the amount of concentrate used in BSA 84 % is less than that used in the HDB (4-5 versus 8-9 liters).

✓ This gain is larger if one takes into account maintenance costs and maintenance of generators that are more expensive due to the formation of precipitates of calcium carbonate and magnesium in the course of HDB. The generalization of the technique remains dependent on the marketing of a module of BSA 84 % integrated generator conventional hemodialysis may minimize the cost of dialysis in the order of 1 euro per session.

CONCLUSION

The clinical and hemodynamic tolerability of BSA 84 %, the best correction of metabolic acidosis and its lower cost, give this technique a special place in the therapeutic arsenal of chronic renal failure.

