

COST / EFFECTIVENESS OF TREATMENT OF MULTIPLE MYELOMA WITH FILTERS HIGH CUT OFF

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INTRODUCTION AND OBJECTIVES

Introduction: Treatment of Multiple Myeloma with filters high cut off (HCO) was started in 2007, first with filter of 1.1 m² and subsequently of 2.1 m². In 2011, Grima published a study based on a cost-effectiveness model, comparing treatment with HCO dialysis with conventional dialysis. Resulting in greater life expectancy and cost savings due to avoided chronic dialysis. In addition, the model predicted a survival of 20 months in standard dialysis, compared with a survival of 34 months with the use of filters HCO, which also provide a higher quality of life because the treatment does not require dialysis.

Working hypothesis:

The HCO hemodialysis is a cost-efficient treatment.

OBJECTIVES

Demonstrate that a combination treatment of chemotherapy and High cut off dialysis improves patient survival and quality of life, besides saving costs because it avoids chronic dialysis

METHODS

In University Hospital Lozano Blesa of Zaragoza, 13 treatments with HCO hemodialysis for acute renal failure secondary to Multiple Myeloma were performed with a success rate of 77%.

Dialysis Protocol: it has been used an Integra monitor, equipped with ultrafilters 1.4 m², ultrapure water, bicarbonate cartridge and centralized acid in a closed loop system. The dialyzer used in all cases is a HCO filter of 2.1 m² Theralite™ of Gambro®. Initially, daily dialysis were performed during 6 sessions; afterwards, dialysis on alternate days was performed until getting levels of free light chains under 500 mg/L or recovering a renal function to avoid dialysis. Duration of every dialysis was 6 hours with low blood flow between 250 and 300 ml/min, and a bath flow of 500 ml/min. Monitoring includes: renal function, blood free light chain, calcium, phosphorus, albumin and ions.

For the economic evaluation of the cost we used a similar model to that of Grima. So mainly we have taken into account the following costs: HCO filter, albumin, dialysis lines, heparin, circuit priming liquid Prontoprime®, dialysis bath (bicarbonate cartridge centralized Bicart® + acid), sodium heparin, 20 ml syringe, saline bag and catheter type Shalldon temporary. However, the two hours of nursery overtime were ignored, because in our unit no increase in staff required, as these patients were considered as any other acute patient. The survival of our patients must be evaluated in a long term; anyway, we can say that 3 patients have survived more than 3 years without dialysis. To compare the results we have accepted Grima survival estimates.

RESULTS

We report our experience in the period between July 2011 and February 2015. 13 treatments were performed at 12 patients with high cut off hemodialysis. 6 patients were diagnosed with monoclonal gammopathy Kappa and 6 were diagnosed with monoclonal gammopathy Lambda, with levels of light chains in serum over 500 mg/L (11,036 mg/L on average at the beginning).

151 dialysis sessions were held in total, the average number of sessions remaining in dialysis treatment with HCO filter was 11,6, with a range between 6 and 27 sessions.

- The cost of fungible and medication needed for HCO dialysis in our hospital is collected in *Table 1*, resulting the total cost of each dialysis session of 942,4 euros. Moreover, as a total of 151 sessions were performed in 13 treatments, corresponding to 11,61 sessions/patient. This represents a total cost of 10,736 euros per case of treatment with HCO dialysis.
- The cost per a conventional dialysis session in our hospital during the period of our study, considering pharmacy costs and fungible (dialysis equipment, lines, liquid, dialyzers, ultrafilters, catheters, etc.) has been 87,11 euros on average per session - data available in the nephrology department memo-. Whereas a patient usually requires 3 sessions per week or 156 sessions per year, so the annual cost per patient in conventional hemodialysis is around 13,589 euros.
- According Grima et al, the median survival of patients with multiple myeloma on dialysis is 20 months. In 20 months of survival would be held 260 sessions per patient than 87.11 euros / session, would cause a total expenditure of 22.648 euros
- In the case of not applying the HCO HD, our patients would have spent 22,648 euros in the 20 months that have survived. In contrast, applying the HCO dialysis they have spent 10.736 euros. This represents a total savings of 11.912 euros (*Table 2*).

Table 1. COST OF HCO HEMODIALYSIS

Dialysis consumables and drugs	PRICE (euros)
HCO FILTER Theralite™ Gambro®	825
VIAL OF HUMAN ALBUMIN 20% 50 ML	17,68
LINES	4,73
DIALYSIS BATH	3,93
PRONTOPRIME™	3,87
HEPARIN	3,20
SALINE FLUID	0,66
SYRINGE	0,026
TRANSIENT CATHETER	65,67
TOTAL SESSION HCO HD	924,76

Table 2. ECONOMIC EVALUATION

HEMODIALYSIS	Nº HD	COST HD	TOTAL
HD HCO	11,61	924,76	10.736
HD CONVENTIONAL	260	87,11	22.648
SAVING			11.912

* A survival of 20 months is calculated

** Only takes into account the cost of consumables and drugs used during hemodialysis

CONCLUSIONS

1. The combined treatment of chemotherapy and HCO hemodialysis has proved to be effective for renal failure secondary to multiple myeloma in 77% of cases.
2. The treatment is cost-effective, cost savings can be estimated about 12,000 euros/patient.

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