

Original article

Application of model of incremental haemodialysis, based on residual renal function, at the initiation of renal replacement therapy[☆]

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ABSTRACT

Introduction: The interest in the preservation of residual kidney function on starting renal replacement therapy (RRT) is very common in techniques such as peritoneal dialysis but less so in haemodialysis (HD). In our center the pattern of incremental dialysis (2 HD/week) has been an option for a group of patients. Here we share our experience with this regimen from March 2008.

Material and methods: We included incident patients with residual diuresis >1000 ml/24 h, clinical stability, absence of edema, absence of hyperkalaemia >6.5 mEq/l and phospho-remia >6 mg/dl, with acceptable comprehension of dietetic care. Exclusion criteria were: clinical instability, no dietary or medical compliance and the afore mentioned laboratory abnormalities.

Results: A total of 24 patients were included in incremental technique. The mean age at start of RRT was 60 ± 15 years. The average time on incremental technique was 19 ± 18 months (range: 7–80), with a mean time on dialysis of 31 ± 23 months (range: 12–86). The reasons for transfer to thrice-weekly HD were: in 6 patients due to laboratory tests, in 2 patients for heart failure events, one for poor compliance and 3 for receiving a kidney graft. The residual diuresis decreased in the first year from 2106 ± 606 ml/day to 1545 ± 558 ($p = .17$) with the urea clearance and calculated residual renal function, basal 5.7 ± 1.5 vs 3.8 ± 1.9 ml/min per year ($p = .01$) and basal 8.9 ± 2.4 vs 6.9 ± 4.3 per year ($p = .28$), respectively.

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Conclusions: Incremental HD treatment, with twice-weekly HD, may be an alternative in selected patients. This approach can largely preserve residual renal function at least for the first year. Although this pattern probably is not applicable to all patients starting RRT, it can and should be an initial alternative to consider.

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Aplicación de una pauta de hemodiálisis incremental, basada en la función renal residual, al inicio del tratamiento renal sustitutivo

R E S U M E N

Palabras clave:

Diálisis incremental
Diuresis residual
Mortalidad
Hemodiálisis

Introducción: El interés por preservar la función renal residual una vez iniciado un tratamiento renal sustitutivo (TRS) es notorio en técnicas como la diálisis peritoneal pero es menor en hemodiálisis (HD). En nuestro centro la pauta de diálisis incremental (2HD/semana) ha sido una opción posible para un grupo de pacientes. Mostramos nuestra experiencia con dicha pauta desde marzo de 2008.

Material y métodos: Incluimos a pacientes incidentes con diuresis residual >1.000 ml/24 h, estabilidad clínica, ausencia de edemas, ausencia de hiperpotasemia >6,5 mEq/l y de fosforemia >6 mg/dl, con aceptable comprensión de los cuidados dietéticos. Fueron criterios de exclusión: la inestabilidad clínica, el no cumplimiento dietético ni médico y las alteraciones analíticas referidas.

Resultados: Veinticuatro pacientes han sido incluidos en la técnica incremental. La edad media al inicio de TRS fue de 60 ± 15 años. El tiempo medio en técnica incremental fue de 19 ± 18 meses (rango: 7-80), con una permanencia media en TRS de 31 ± 23 meses (rango: 12-86). Los motivos de cambio a 3HD/semana fueron: 6 pacientes por parámetros analíticos, 2 por episodios de insuficiencia cardiaca, uno por mal cumplimiento terapéutico y 3 por recibir un injerto renal. La diuresis residual desciende en el primer año de 2.106 ± 606 ml/día a 1.545 ± 558 ($p = 0,07$) junto con el aclaramiento de urea y la función renal residual calculada, basal de $5,7 \pm 1,5$ vs. $3,8 \pm 1,9$ ml/min al año ($p = 0,01$) y basal de $8,9 \pm 2,4$ vs. $6,9 \pm 4,3$ al año ($p = 0,28$), respectivamente.

Conclusiones: La HD incremental, con 2 sesiones de HD/semana, puede ser una alternativa en un grupo seleccionado de pacientes. Esta modalidad puede preservar la función renal residual en buena medida, al menos durante el primer año. Aunque probablemente no sea aplicable a todos los pacientes que inician TRS, puede y debe ser una alternativa inicial que considerar.

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Introduction

Residual renal function (RRF) is associated with increased survival in patients with advanced renal disease.¹ Numerous studies have shown that it is important to maintain RRF in peritoneal dialysis.^{2,3} Some studies in haemodialysis (HD) have highlighted the benefits of RRF, however its role has received only limited attention.^{1,4} Recent studies, have shown improved survival of patients with preserved RRF, and have also emphasized the difficulty involved in the management of RRF in routine clinical practice.⁵⁻⁸

Preserving RRF is associated with better survival and also results in a better tolerance of haemodialysis, improved control of calcium-phosphorus metabolism, better nutritional status, as well as a beneficial effect on anemia and perceived quality of life in patients receiving renal replacement therapy (RRT).⁹⁻¹¹

The loss of RRF during the first few months of RRT is well described. This loss of RRF is associated with several factors: episodes of hypotension, volume depletion, activation of inflammatory mediators, biocompatibility of dialyzers and dialysis fluid, and the use of nephrotoxic treatments and contrast media.^{12,13} Incremental dialysis, starting with twice-weekly sessions and gradually adjusting the length of dialysis under close medical supervision, is well tolerated and the residual urine output is preserved without complications.^{1,6,7,14}

In our center, we decided to introduce incremental HD at the commencement of RRT. To do so we followed the kinetic model developed by Gotch in 1985, in which adequate dialysis is achieved provided if urea clearance does not fall below 2.5 ml/min.^{15,16} In the present study, we describe how we have implemented this strategy in our hospital over the past 7 years. Our objective is to analyze the evolution of patients with incremental HD particularly their residual

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