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Effectiveness of the scheme reimpregnation maintenance schedule vs. ceftazidime/cephalothin in dialysis patients with peritonitis☆

Eficacia del esquema de impregnación vs. esquema de mantenimiento con ceftazidima/cefalotina en pacientes con peritonitis por diálisis

Dear Editor:

Peritoneal dialysis is a type of renal replacement therapy that uses the physical and chemical properties of the peritoneal membrane to perform ultrafiltration and clearance processes.[1–3] One complication of this procedure is peritonitis,[4,5] which is diagnosed with the presence of at least two out of the three following criteria: a leukocyte count higher than 100 mm^{-3}, a corresponding clinical picture and microorganisms on a Gram stain.[4,5]

The International Society for Peritoneal Dialysis recommends management with first-generation cephalosporins for Gram-positive microorganisms and third-generation cephalosporins for Gram-negative microorganisms.[6]

It also recommends starting treatment with third-generation cephalosporins (ceftazidime) and first-generation cephalosporins (cefalotin) by the intraperitoneal route, with permeation doses of one gram and maintenance doses of 250 mg every 6 h; however, the response is uncertain.[7]

Against this background, the aim of this study was to compare the efficacy of the permeation regime and the maintenance regime in patients with peritonitis due to dialysis.

A cohort study was conducted in patients with end-stage renal disease and peritonitis. The exposure group included patients treated with a permeation regimen (one gram of ceftazidime/cefalotin q 24 h); the unexposed group included patients with a maintenance regimen (one gram initially and 250 mg of ceftazidime/cefalotin q 6 h thereafter).

Patients with a diagnosis made by cell count were included; patients with refractory peritonitis, recurrent peritonitis or cephalosporin allergy were excluded.

The sample (31 per group) was calculated using a percentage formula for 2 populations, assuming that the efficacy of ceftazidime/cefalotin was 60% in the permeation group and 35% in the maintenance group.

Their sociodemographic characteristics, concomitant diseases, modality of dialysis, time on peritoneal dialysis and time of progression of chronic kidney disease were studied.

Therapeutic efficacy was established through cell counts, using 99 cells per field as a cut-off point, evaluated at 24, 48, 72 and 96 h.

Analysis included percentages, averages, standard deviations, Student's *t*-test for independent populations and the chi-squared test.

Age and gender were similar in the permeation group and the maintenance group: 48.06 ± 17.79 years and 55.07 ± 12.64 years ($p = 0.84$); male gender with 65.6% and 62.1%, respectively ($p = 0.77$). In these groups the prevalence of hypertension

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Table 1 – Time in dialysis and CKD by permeation (PERM) group and maintenance (MAIN) group in peritonitis. Mean (SD).

	Antibiotic therapy			
	PERM	MAIN	t	p
Years in PD	21.1 (16.6)	16.1 (12.3)	1.3	0.19
Years of CKD	23.5 (17.0)	18.2 (13.0)	1.3	0.18

Table 2 – Efficacy of permeation and maintenance by start time of treatment in peritonitis.

Start time of treatment	Efficacy[a]		p	RM
	Permeation	Maintenance		
	Percentages			
At 24 h	0.0	0.0	1.00	0.0
At 48 h	21.9	13.8	0.4	1.7
At 72 h	50.0	41.4	0.5	1.4
At 96 h	65.6	41.4	0.05	2.7

[a] Efficacy was considered to be a cell count lower than or equal to 99 cells per field.

($p = 1.00$), diabetes mellitus ($p = 0.62$) and drug immunosuppression ($p = 0.35$) were similar.

In both groups there was a predominance of continuous ambulatory peritoneal dialysis (59.4% and 69.0%, respectively; $p = 0.51$). Time in dialysis ($p = 0.19$) and time of progression of chronic kidney disease ($p = 0.18$) were similar in the groups (Table 1).

Seventy two hours after initiation of therapy, efficacy was 50.0% in the permeation group and 41.4% in the maintenance group; however, they were not statistically different ($p = 0.50$). At 96 h, a statistical difference was found: in the permeation modality 65.6% showed efficacy and in the maintenance modality 41.4% showed efficacy ($p = 0.05$) (Table 2).

In the management of bacterial peritonitis associated with dialysis, the antimicrobial regimens and dosage regimens proposed in clinical practice guidelines have shown to produce ineffective results, hence the importance of this study analysing the prolonged stay of the antibiotic in the abdominal cavity and the decrease in the manipulation of the peritoneal cavity.[8]

It was ensured that the 2 groups were statistically similar with respect to disease history, type of dialysis, time of progression of chronic kidney disease and time in dialysis as these were significant benchmarks that made comparison between the different management regimens more reliable.

Similarly, the same antibiotic was used in the 2 groups as this made it possible to be certain that what was being compared was the number of drug administrations (one administration vs 4 administrations). The pathophysiological substrate was the drug's cumulative capacity in the peritoneum and its half-life, as well as the peritoneum's lower exposure to the introduction of microorganisms in each drug administration. To date, this matter has not received enough attention.[8,9]

Cephalosporins are first-line antibiotics in the treatment of peritonitis in dialysis: as they are administered by the intraperitoneal route, they penetrate the tissue wall and achieve a half-life of 48–72 h. However, it will be necessary to clarify whether the efficacy achieved in the permeation regimen is due to the fact of exposing the peritoneum to a high dose of antibiotic, or to the fact of decreasing the events that penetrate the peritoneal cavity and therefore the potential for keeping from introducing germs into the cavity.[6]

In conclusion, the permeation regimen has a greater efficacy than the maintenance regimen in the management of peritonitis secondary to peritoneal dialysis.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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Successfull simultaneous pancreas kidney transplantation in a patient with congenital partial lipodystrophy☆

Trasplante simultáneo de riñón y páncreas exitoso en paciente con lipodistrofia parcial congénita

Dear Editor,

Lipodystrophies (LDs) are a heterogeneous group of genetic and acquired disorders that mainly affect women. They are characterised by total or partial loss of subcutaneous adipose tissue (lipoatrophy), which may be associated with accumulation of fat (lipohypertrophy) in different regions of the body. Patients with LDs have extreme insulin resistance, hyperglycaemia, severe hypertriglyceridaemia, low HDL levels and fatty liver. The seriousness of these metabolic complications is correlated with the extent of fat loss.[1,2]

There are 2 hereditary forms:

- Generalised lipodystrophy, which has an autosomal recessive inheritance pattern and is characterised by total loss of subcutaneous adipose tissue, and
- Congenital partial lipodystrophy, the more common form, which has an autosomal dominant inheritance pattern and is linked to partial loss of adipose tissue.[3]

Several researchers have noted that the metabolic abnormalities observed are due to a failure in the functions of regulation of fatty acid storage and release of adipose tissue. There are also genes involved in the effector actions of insulin, and in adipocyte proliferation and differentiation. Different candidate genes have been analysed, such as the insulin receptor gene, the insulin receptor substrate 1 gene and the beta-2 adrenergic receptor gene.[4] The lack of subcutaneous adipose tissue deposits is due to the low concentration of leptin. Hypoleptinaemia alters the hunger/satiety signals in the central nervous system and causes hyperphagia. Then, caloric excess causes fat to accumulate in the muscles and liver and triggers severe insulin resistance, diabetes with high insulin requirements and hypertriglyceridaemia, which creates a high risk of pancreatitis. Patients with LDs also have fatty liver, myocardiopathies and proteinuric nephropathies.[5]

A 41-year-old female patient with a diagnosis of congenital partial lipodystrophy, diabetes diagnosed at age 15, being treated with insulin aspart (115 IU/day), with poor glycaemic control, who had bilateral proliferative retinopathy and end-stage renal disease secondary to membranoproliferative glomerulonephritis type I (by renal punch biopsy [RPB]), in haemodialysis three times per week since April 2012. In addition, she had mixed dyslipidaemia being treated with atorvastatin 20 mg/day and fenofibrate 200 mg/day and HTN. Physical examination (PE): dry weight 66.500 kg; height 170 cm; BMI: 23.01; BP 160/70.

Her limbs looked thin, with loss of subcutaneous fat in the buttocks, thighs and upper limbs. Hypotrophic breasts, slight hepatomegaly, acanthosis nigricans on the neck and hirsutism.

It was decided to place her on the waiting list for a double kidney–pancreas transplant, considering her CKD in dialysis and her diabetes without insulin resistance,

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