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Brief review

Peritoneal dialysis: A factor of risk or protection for posterior reversible encephalopathy syndrome? Review of the literature☆

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ABSTRACT

Posterior reversible encephalopathy syndrome is a clinical and radiological entity with acute or subacute neurological presentation associated with brain lesions that primarily affect the white matter of the posterior regions. It is often associated with the rapid onset of severe hypertension and/or with kidney failure (acute and chronic), but it has also been reported as a neurological complication in several medical conditions. In recent years, there has been an increase in the number of cases and related publications due to the advance of diagnostic imaging techniques. The characteristic radiological finding includes hyperintense lesions in T2- and FLAIR-weighted magnetic resonance imaging, which are often bilateral and located in the posterior cerebral regions and correspond to areas of vasogenic oedema.

Little is known about the pathophysiology of posterior reversible encephalopathy syndrome. The most accepted theory, especially in cases with associated hypertension, is the loss of cerebral self-regulation which leads to the onset of vasogenic oedema. The main feature of this syndrome is the reversibility of both symptoms and cerebral lesions with an early and appropriate diagnosis.

Despite the frequent association with kidney failure and severe hypertension, there are few cases reported in patients on peritoneal dialysis. This article presents a review of PRES in peritoneal dialysis patients in the published literature.

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Diálisis peritoneal: ¿un factor de riesgo o de protección para la encefalopatía posterior reversible (PRES)? Revisión de la literatura

Palabras clave:
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RESUMEN

El síndrome de encefalopatía posterior reversible es una entidad clínico-radiológica con presentación neurológica aguda o subaguda, asociada a la presencia de lesiones que afectan sobre todo a la sustancia blanca de las regiones cerebrales posteriores. Se asocia principalmente con hipertensión severa de rápido desarrollo, o con insuficiencia renal (aguda o crónica), aunque se ha descrito también como una complicación neurológica de varias entidades médicas. En los últimos años se está produciendo un aumento en el número de casos y publicaciones relacionadas, debido al avance de las técnicas diagnósticas de imagen. El hallazgo radiológico característico es la presencia en la resonancia magnética de lesiones hiperintensas en las secuencias T2 y FLAIR, frecuentemente bilaterales y localizadas en las regiones cerebrales posteriores, que se corresponden con zonas de oedema vasogénico.

Poco se conoce de la fisiopatología del síndrome de encefalopatía posterior reversible. La teoría más aceptada, sobre todo en los casos con hipertensión asociada, es la de la pérdida de la autorregulación cerebral, que conduce a la aparición de oedema vasogénico. Su característica principal es la reversibilidad, tanto de la clínica como de las lesiones cerebrales, con un diagnóstico precoz y adecuado.

Pese a la frecuente asociación con insuficiencia renal y con hipertensión severa, son pocos los casos publicados en pacientes de diálisis peritoneal. Presentamos aquí una revisión del síndrome de encefalopatía posterior reversible en pacientes en diálisis peritoneal y de la casuística publicada.

Introduction

Posterior reversible encephalopathy syndrome (PRES) is a clinical-radiological condition with acute or subacute neurological presentation, associated with the presence of brain lesions predominantly affecting white matter in the posterior regions. The main characteristic is the reversibility of both clinical symptoms and the brain lesions, if a correct diagnosis is made early.[1–6]

PRES is mainly associated with severe, rapid-onset arterial hypertension (HTN) or with kidney failure (acute or chronic), although it has also been reported as a neurological complication of several medical conditions, such as eclampsia, vasculitis and connective tissue diseases, blood diseases, liver disease, hypercalcaemia, the use of erythropoietin and a wide range of immunosuppressive or cytotoxic drugs[1–6] (Table 1).

Despite the frequent association with severe HTN and with kidney failure, it is surprising how few cases have been published in the context of peritoneal dialysis (PD); still, some authors have pointed out that this dialysis technique could be another triggering factor of the symptoms.[7–9]

This was reported for the first time in 1996[10] and its nomenclature became the subject of much debate.[11] Initially named posterior reversible leukoencephalopathy syndrome, the symptoms were considered a variant of hypertensive encephalopathy. However, as brain involvement is not always limited to white matter, the use of the term posterior reversible encephalopathy syndrome (PRES) is becoming more widely accepted. In contradiction to the name, the disease may also affect anterior areas of the brain and may not be reversible.[1,12,13]

Its incidence and prevalence are not entirely known, although in the last few years there has been an increase in the number of related publications and cases, particularly due to the advance in diagnostic imaging techniques. It seems to be slightly less prevalent in women,[9,12] and very common in children with kidney failure.[14,15] While it was thought that the

Table 1 – Triggering factors associated with PRES.

Acute arterial hypertension
Kidney diseases: *kidney failure* (acute or chronic), glomerulonephritis
Eclampsia
Sepsis and multiple organ failure
Autoimmune diseases
Haematological diseases: *HUS*, graft-vs-host disease, TTP, sickle cell anaemia
Immunosuppressive therapy: *cyclosporine, tacrolimus*, interferon alfa
Cytostatics: doxorubicin (adriamycin), vincristine, cyclophosphamide, cytarabine, cisplatin, methotrexate, immunoglobulins
Transplants: kidney, liver, bone marrow
Miscellaneous: cocaine, *erythropoietin*, hypercalcaemia after transfusion, acute intermittent porphyria, HIV+, methylprednisolone, amphotericin B

HUS, haemolytic uraemic syndrome; TTP, thrombotic thrombocytopenic purpura.
The most common are in italics.