



ORIGINAL ARTICLE

Study of kidney damage in pediatric patients with neurogenic bladder and its relationship with the pattern of bladder function and treatment received[☆]



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KEYWORDS

Neurogenic bladder;
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Abstract

Objectives: Kidney failure is the main cause of morbidity and mortality in patients with myelodysplasia. We analyzed the presence of renal lesions in these patients using dimercaptosuccinic acid scintigraphy and related their presence with the type of vesical function and the delay in receiving appropriate management.

Material and methods: We performed a retrospective study of patients with myelodysplasia treated in our hospital since 2004. We analyzed the epidemiological and clinical data and the pattern of bladder function according to urodynamic studies. We classified the patients into 4 urodynamic patterns according to detrusor and sphincter behavior. We linked this behavior to renal function in the scintigraphy and the care received since birth.

Results: The study included 39 patients with myelodysplasia. The most common bladder pattern was type A (61.5%), with sphincter and detrusor hyperactivity, followed by type D (20.5%), C (7.8%) and B (5.1%). Some 38% of our patients ($n=15$) had some type of nephropathy. Some 92.9% of the children who were properly treated during the first year of their life had no renal lesions in the scintigraphy. We found some type of nephropathy in 56% of the patients for whom appropriate treatment was delayed for more than a year. The nephropathy was more severe the later the management was started.

Conclusions: There is a statistically significant relationship between a delay in treatment and impairment in renal scintigraphy in patients with neurogenic bladders. The early study and treatment of patients is essential for decreasing renal impairment, reducing the need for surgery and improving the continence options.

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PALABRAS CLAVE

Vejiga neurógena;
Urodinámica;
Función renal

Estudio del daño renal en el paciente pediátrico con vejiga neurógena y su relación con el patrón de funcionamiento vesical y el tratamiento recibido

Resumen

Objetivos: El fallo renal es la principal causa de morbimortalidad en pacientes con mielodisplasia. Analizamos la presencia de lesiones renales en la gammagrafía (DMSA) de estos pacientes y la relacionamos con el tipo de funcionamiento vesical, así como con el retraso en recibir un manejo adecuado.

Material y métodos: Realizamos un estudio retrospectivo de pacientes con mielodisplasia en nuestro hospital desde 2004. Analizamos datos epidemiológicos, clínicos y el patrón de funcionamiento vesical según estudios urodinámicos. Clasificamos a los pacientes en 4 patrones urodinámicos según el comportamiento del detrusor y del esfínter; y lo relacionamos con la función renal en la gammagrafía y el manejo recibido desde el nacimiento.

Resultados: Estudiamos 39 pacientes con mielodisplasia. El patrón vesical más frecuente fue el tipo A (61,5%) con hiperactividad del esfínter y del detrusor, seguido del D (20,5%), C (7,8%) y B (5,1%). El 38% de nuestros pacientes (n = 15) presenta algún tipo de nefropatía. El 92,9% de los niños que reciben tratamiento adecuado en el primer año de vida, no presentan lesiones renales en la gammagrafía. Encontramos algún tipo de nefropatía en el 56% de los pacientes en los que el tratamiento adecuado se demora más de un año; siendo la nefropatía más severa cuanto más tarde se inicia el manejo.

Conclusiones: Existe una relación estadísticamente significativa entre el retraso en el tratamiento y la alteración en la gammagrafía renal en pacientes con vejiga neurógena. Es fundamental el estudio y tratamiento precoz de los pacientes para disminuir el deterioro renal, disminuir la necesidad de cirugía y mejorar las opciones de continencia.

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Introduction

Nearly all patients with defects in the closure of the neural tube have alteration at the level of the lower urinary tract innervation (neurogenic bladder).¹ This triggers problems both in the bladder filling and emptying function, which means, in most patients, that the bladder will be subjected to high pressures. If treatment is not established, there will be a progressive deterioration of the upper urinary tract and kidney failure. Both urinary infections and renal scarring are a threat to these patients, renal failure constituting the leading cause of morbidity and mortality.²

Urodynamic studies allow us to assess the activity of the bladder detrusor and urinary sphincter. Roughly, we can find over or underactivity at the detrusor level, as well as over or under activity at the level of the sphincter. These features are independent and can be combined interchangeably, leading to 4 main basic bladder patterns.³

The main objectives in the urological management of these patients are to preserve renal function and achieve social continence. The treatment will be customized depending on the bladder pattern that each patient has and its management, conservatively, is mainly based on the use of anticholinergic drugs and performing clean intermittent catheterization (CIC). If early treatment is not established, high bladder pressures will be favored with the emergence of vesicoureteral reflux and urinary tract infections, which will progressively lead to a loss of kidney function.¹

We revised our patients with myelodysplasia comparing the lesions developed in the DMSA, with the time it takes for

them to receive treatment, aimed at preserving renal function. Furthermore, we studied the incidence of scintigraphic abnormalities depending on the different bladder patterns.

Material and methods

We performed a retrospective study of 39 patients with myelodysplasia controlled in the pediatric urodynamic unit of our hospital between 2004 and 2014.

We collected epidemiological data (sex, age at first consultation in our unit, place of origin, ...), clinical data (urinary infections, vesicoureteral reflux, ...), complementary studies (urodynamics, ultrasound, VCUG, DMSA scan), treatment received (CIC, anticholinergics, enterocystoplasty, artificial sphincter, treatment for reflux, ...) and time to receive adequate management to preserve renal function.

On arrival at the unit, a personal survey is conducted to each patient, noting down the treatment carried out so far, the presence of urinary infections with fever, etc. We conducted physical examination, we scheduled for conducting urodynamic study, and requested cystourography to establish the presence or absence of vesicoureteral reflux and its degree.

All our patients helped when performing the urodynamic study, without requiring sedation in any of the cases. We conducted urodynamic study with a filling rate of between 10 and 20 cm³/min (between 5 and 10% of the expected bladder capacity depending on age). We measured various

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