

Ventriculoperitoneal shunt and peritoneal dialysis: “A paradigm for the health team”. Report of 4 cases

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Abstract

4 cases of ventriculoperitoneal shunt (VPS) and peritoneal dialysis (PD), a rare combination of clinical therapies, assisted at Versailles RTS Renal Unit in Cali, Colombia. Of these, 3 are spina bifida patients aged as follows at the start of PD: 6, 10 and 17 years old, and a case of head trauma in an elderly adult aged 80 at the start of PD. These cases are discussed and the literature is reviewed.

Key words: Ventriculoperitoneal shunt; peritoneal dialysis (MeSHsource).

Derivación ventriculoperitoneal y diálisis peritoneal: “Un paradigma para el equipo de salud”. Reporte de 4 casos

Resumen

Se presentan 4 casos de derivación ventriculoperitoneal (DVP) y diálisis peritoneal (DP), combinación de terapias clínicas poco frecuentes, atendidas en la Unidad Renal RTS Versalles, en Cali, Colombia. De los cuales, 3 corresponden a pacientes con espina bífida en edades de inicio de la DP así: 6, 10 y 17 años, y un caso de trauma craneoencefálico en un adulto mayor, con edad de inicio de DP a los 80 años. Se comentan los casos y se revisa la literatura.

Palabras clave: Diálisis peritoneal; Derivación ventriculoperitoneal (fuente DeCS).

Currently, chronic kidney disease (CKD) affects more and more people every day, including pediatric population, becoming, thus, a public health problem with increasing incidence and prevalence, incidence of 1-3 children per million population, which underestimates its

real value¹. Similarly, in 2008 the median incidence of pediatric population, from 0 to 19 years old, in renal replacement therapy (RRT) was 9 millions worldwide, with a prevalence of between 18 and 100 per million of the population of this age².

PD is a frequent RRT in children with CKD, which uses the peritoneum as a dialysis membrane between the blood flowing through the capillaries and a solution infused in the peritoneal cavity³.

PD is one of the RRT of choice both in pediatric and adult area, because of its safety, effectiveness and comfort. There is a group of patients with CKD and history of VPS with spina bifida and other entities⁴, for which when having stage 5 CKD with requirement for dialysis therapy, PD management is controversial, either because of lack of experience, because of the uncommon presentation of this clinical situation, or because of the limited literature on the topic, leading to provide, ultimately, hemodialysis.

A VPS is a catheter placed under the skin, from the back of the ear, down the neck and chest and, generally, to the peritoneal cavity. It helps to drain the excess of cerebrospinal fluid and relieves pressure on brain. It must be placed as soon as hydrocephalus is diagnosed. In children, one of the main diseases leading to CKD with neurogenic bladder and recurrent urinary infections is spina bifida, a condition where many patients have a VPS and, even though there is no clear statistics on the number of pediatric patients with spina bifida that develop CKD with RRT requirement, the study by Bowman et al., found that 75% of patients with congenital spina bifida reached adulthood and 86% of them had a VPS. CKD in these patients was associated with chronic and recurrent pyelonephritis because of vesical dysfunction^{5,6}.

In the experience observed by Warady and Kazee et al., where they monitored a group of patients with VPS and PD, the presence of recurrent peritonitis without ascending shunt infections was reported⁷⁻⁹. Similarly, the study by the Hospital of Montevideo, Uruguay, reported 5 patients of school age and adolescents, of whom 4 had no clinical evidence of peritonitis retrograde infection through the VPS or deterioration of drainage⁸.

This paper aims to show an experience of a group of patients with VPS and PD, assisted at Versailles RTS Renal Unit in Cali, Colombia, to whom, for different reasons such as difficulties in vascular access or social conditions, it was difficult to provide hemodialysis, and that were, ultimately, implanted

with a catheter for chronic PD. Similarly, there is a paradigm in clinical teams for fear of causing or triggering an infection of the VPS, beyond peritonitis.

Case reports

Case 1

Female patient who at 3 months of age was implanted with a VPS, diagnosed with myelomeningocele (surgically corrected), hydrocephalus and neurogenic bladder. From an urban area (Popayan) in the south western of Colombia, at six years old, she initiates PD in 2011 with a duration of 9 months on Automated Peritoneal Dialysis (APD), which presented no infectious complications secondary to dialysis therapy, nor VPS. In the same year, she receives a deceased-donor transplant, and currently has a 7-year monitoring at nephropediatrics.

Case 2

Female patient who at 3 months of age is implanted with VPS, diagnosed with encephalocele and bilateral renal dysplasia. From a rural area (Zarzal), in the north of Valle del Cauca, at 10 years old, she initiates PD therapy in 2003. 6 months from the initiation of therapy there was a rupture of the peritoneal catheter near the outlet, which caused peritonitis. She is taken to surgery where they remove the PD catheter, temporarily stopping hemodialysis for 3 months. No signs of neurological involvement are present, and PD is resumed with a duration of 60 months on APD with a wet day, during which there was no other episode of peritonitis, or infection of outlet or tunnel, nor VPS dysfunction. In 2008, she receives a deceased-donor transplant, and she is 19 years old, and continues her monitoring at nephropediatrics.

Case 3

Male patient, who at 25 months of age is implanted with a VPS, diagnosed with lumbosacral myelomeningocele (corrected 24 hours after birth), neurogenic bladder, reflux nephropathy, and obstructive uropathy. From a rural area (Jamundí) in the south of Valle del Cauca, at 12 years old, he initiates he-

modialysis therapy in 2005, with a stay on this therapeutic mode of 57 months. Because of a difficulty in the vascular access, a PD catheter is implanted in 2010 with a duration of 23 months on APD. He did not have any other episode of peritonitis or infections of outlet or tunnel, nor VPS dysfunction. He is currently 19 years old, and his dialytical therapy is monitored by nephrologists and nurses.

Case 4

Female patient who at 68 years of age suffers traumatic brain injury when falling from her own height, with secondary hydrocephalus which required PVS implant. From an urban area of Palmyra, the second biggest city of Valle del Cauca, at 80 years of age she initiates PD therapy because of a advanced de-compensate dilated cardiomyopathy with a duration of 15 months on manual peritoneal dialysis (CAPD). She did not present any infectious complication secondary to dialysis therapy, nor VPS dysfunction.

Currently, she is 83 years old and continues to be monitored by nephrologists and nurses.

Conclusions

The experience gained in managing these 4 patients with VPS and PD motivated us to present this case-report, as there is disagreement on the issue in our profession. Additionally, this paper has the aim of developing cognitive processes in health teams, necessary to integrate and evaluate the data found in the light of the theoretical knowledge and relevant information. As evidenced in this experience, there is feasibility and safety of this therapy mode in this group of patients. Because there is a less clear on VPS and PD panorama, some literature considers VPS as an absolute contraindication for PD.

With little written evidence, we agree with Warady et al., and Muller et al. REFE7 on the idea that PD, in this group of patients, must not be considered as

Table 1

Sociodemographic data and results of patients with VPS and PD

Patient	1	2	3	4
Sex and Age at the initiation of dialysis	F/6	F/10	M/17	F/80
Time on peritoneal dialysis (months)	9	60	23	15
Number of peritonitis episodes	0	1	0	0
VPS Functioning	Yes	Yes	Yes	Yes
Socioeconomic status	2	3	2	3
Number of carers performing therapy	1	1	1	2
Relationship with the patient	Grandfather	Mother	Mother	Children s
Environment conditions at exchange area	Adequate	Adequate	Marginal*	Adequate
Therapy mode	APD	APD	APD	CAPD
Desenlace del paciente	Trasplantada	Trasplantada	En diálisis peritoneal	En diálisis peritoneal
Last o KT/V	2.2	1.8	1.7	4.7
Residual renal function	600 ml	1100 ml	1400 ml	700 ml
Intermittent bladder	Catheterization vesicales intermitentes	Catheterization vesicales intermitentes	Not at the start of PD	Spontaneous micturition

*Environment conditions related to the home (under construction). For this reason, the patient’s family made some adaptations to the exchange area, such as: handcrafted washbasin, and covering of the walls and roof with plastic.

an absolute but relative contraindication, taking into account that most of our patients live in distant places, where the topography and socioeconomic status may be a barrier for hemodialysis therapy. In addition, the criteria for making the decision to initiate this therapy mode should be based on an analysis of the individual needs of each patient.

Since the main objective of the interdisciplinary team working with patients requiring dialysis therapy is to maintain adequate quality of life, cases such as the management of patients with VPS and PD become a great challenge for the whole team.

Thanks to the close monitoring, not only in the renal unit, but also in home visits, training and perfecting of PD technique, together with the adjustments of the exchange, make this therapy mode safer for patients, controlling risk factors for peritonitis, which is the main concern in this group, as reported by Chadha¹⁰.

As can be seen from the reported cases, only one patient had a peritonitis episode in 5 years of therapy, which is a good indicator, considering that the infection was not caused by the carer's technique or environmental conditions, but by catheter rupture.

There is no clear picture of the relationship between VPS and PS and, on the other hand, the experience gained over these years leads us to recommend reviewing more series of similar clinical cases to determine specific criteria of care. However, in this group of patients, PD is a viable alternative and is no longer a paradigm in our field.

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