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Peritoneal dialysis in the Republic of Congo: history and current issues (letter)

(La dialyse péritonéale en République du Congo : historique et problématique actuelle)

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Summary

Summary of the letter to the editor: The authors aim to review the history of peritoneal dialysis (PD) in Congo Brazzaville, report results, and describe a catheterization technique using a nasogastric tube in the absence of specific catheters.

PD as a renal replacement therapy modality was first introduced in the Republic of Congo in 1989 by MPIO and colleagues, but the program was discontinued in 1994 due to insufficient resources. Since 2022, we have reintroduced this technique in pediatric intensive care to treat children with acute renal failure. Our current PD technique uses a nasogastric tube placed subumbilically by a pediatric surgeon under local anesthesia, with a locally manufactured dialysis solution infused at a dose of 50 ml per kg per day of a mixture of lactated Ringer's solution and hypertonic saline, with an ampoule of 30% hypertonic saline or Icodextrin in the event of acute pulmonary edema. Six patients benefited from this treatment modality, with clear clinical improvement in two patients.

The description of peritoneal access via a nasogastric tube shows that PD can be adapted for use in all countries without PD units. Our overall results encourage the pursuit of PD and motivate the creation of a PD unit at Centre Hospitalier Universitaire of Brazzaville. We will need additional resources to save children and treat adults.

Keywords: Congo Brazzaville, peritoneal dialysis, peritoneal catheter

Résumé

Dans ce courrier à l'éditeur les auteurs ont pour but de faire l'historique, au Congo Brazzaville, de la dialyse péritonéale, de rapporter les résultats et de décrire une technique de cathétérisme à l'aide d'une sonde naso-gastrique en l'absence de disponibilité de cathéters spécifiques.

La DP comme modalité de traitement de suppléance rénale a été introduite pour la première fois en République du Congo en 1989 par MPIO et ses collègues, mais le programme a été arrêté en 1994 du fait de ressources insuffisantes. Depuis 2022 nous avons ré introduit cette technique en réanimation pédiatrique pour traiter les enfants atteints d'insuffisance rénale aiguë. Notre technique actuelle de DP utilise une sonde nasogastrique placée en sous-ombilical par un chirurgien pédiatre sous anesthésie locale, avec comme solution de dialyse, de fabrication locale, une solution perfusée à la dose de 50ml par kilogramme et par jour d'un mélange d'un soluté de Ringer lactate et de sérum glucosé hypertonique avec une ampoule de sérum glucosé hypertonique à 30% ou d'Icodextrine en cas d'œdème aigu du poumon. Six patients ont bénéficié de cette modalité de traitement avec sur le plan clinique une nette amélioration chez deux patients.

La description de l'accès péritonéal par sonde naso- gastrique révèle que la DP peut être adaptée à tous les pays n'ayant pas d'unités de DP. Nos résultats globaux encouragent la poursuite de la DP et motivent la création d'une unité de DP au CHU/B. Des moyens supplémentaires devront nous être alloués afin de sauver davantage d'enfants et traiter les adultes.

Mots-clés : Congo Brazzaville, dialyse péritonéale, cathéter péritonéal



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Letter to the editor:
Peritoneal dialysis in the Republic of Congo: history and current issues

Dear Sir,

We would like to draw your attention to the use of peritoneal dialysis (PD) in the Congo for the treatment of children suffering from acute renal failure by reporting our experience.

PD is an extrarenal purification technique using the peritoneum as a purification membrane. It is one of the treatment modalities for chronic kidney disease (CKD).

The prevalence of patients treated with PD varies from country to country.

In 2007, the African dialysis population represented just 4.5% of the global dialysis population, with a prevalence of 74 patients per million (ppm) inhabitants, compared with the world average of 250 ppm. In almost half of African countries, no dialysis patients are registered. The prevalence of PD in Africa is 2.2 ppm compared with a worldwide prevalence of 27 ppm. (1) The majority of African patients (85%) reside in South Africa. In North African countries, which contain 93% of the African dialysis population, PD as a replacement modality for CKD is only 0–3%.

Cost is a major factor affecting the provision of dialysis treatment, forcing many countries to ration dialysis therapy. Remote locations, transport difficulties, low electrification rates, limited access to sanitation and water sources, unsuitable living conditions, and a limited number of nephrologists are all obstacles to the development of PD in many countries. The Republic of Congo does not have a PD program, but there is renewed interest in PD as a renal replacement therapy.

MPIO and colleagues (7) first introduced PD in the Republic of Congo in 1989, and 31 patients were treated using continuous ambulatory peritoneal dialysis (CAPD) between August 1, 1989, and July 31, 1993, before the program was discontinued. CAPD was then scarcely known in black Africa. The mean age of the CAPD patients was 37 +/- 13 years, while the mean duration of dialysis was 9 +/- 4 months. Moreover, 6 patients were seropositive for HIV, and 25 were seronegative. Peritonitis occurred once every 7.2 months per patient, and it was more frequent in HIV-positive than in HIV-negative dialysis patients. Cultures were negative in almost 50% of cases. When cultures were positive, *Staphylococcus aureus* infections predominated. Annual mortality was 60%. Patient survival rates were 40% after 1 year and 23% after 2 years. Undernutrition, poorly tolerated uremia, voluntary cessation of dialysis, and peritoneal infection were the main causes of this high mortality. Infections were promoted by precarious socio-economic conditions, under-equipped health infrastructure, and Congo's hot, humid tropical climate. The cost of CAPD was high. This high cost posed serious financial problems, given the non-existence of social security structures. At the end of the study, it became clear that the success of the method and the improvement in dialysis survival rates could only be guaranteed by motivating paramedical staff and patients and by establishing appropriate socio-economic conditions.

In 1995, Assounga et al. (8) presented a retrospective study of patients with acute renal failure at the African Society of Nephrology Congress. This study was a six-year retrospective investigation analyzing the etiology and evolution of acute renal failure (ARF) at Centre Hospitalier Universitaire (CHU) of Brazzaville from 1989 to 1994. One hundred and five cases of acute kidney injury (AKI)—54 boys (51.4%) and 51 girls (48.6%)—were admitted to the pediatric

ward of CHU. The main etiologies of ARF were acute gastroenteritis with dehydration (25.7%), nephrotic syndrome (14.7%), sepsis (15.23%), malaria (12.38%), and acute glomerulonephritis (9.5%). Most cases were treated conservatively, while PD was used in 8 cases (7.62%). The outcome of AKI was a cure, death, and progression to chronic renal failure in 50.5%, 37%, and 12.5% of cases, respectively. Due to the shortage of consumables, PD has been abandoned. In 2002, Loumingou described cases of children saved by PD.

In 2022, we resumed PD to save children suffering from ARF. We had no conventional PD catheter at our disposal. We therefore decided to use an intraperitoneal nasogastric tube to save these children with severe ARF. We did not include adults and CKD patients. Instead, we only covered children with ARF.

PD was prescribed as follows: infusion of 50 ml per kg per day of a mixture of 10% hypertonic saline with 1 vial of 30% hypertonic glucose in each 500 ml of lactated Ringer's solution. In the event of PAO, we used Icodextrin solution instead of hypertonic serum with lactated Ringer's solution. The dwell time varied between patients, ranging from 1 to 4 h for 4 patients. Our current prescription entails a 1 h dwell time and 5 exchanges per day, which was the case for the last 2 patients we report. (11)

PD catheter insertion technique

Under local anesthesia, a subumbilical approach is utilized. This is followed by subcutaneous dissection, median fasciotomy, and median celiotomy. A 14-gauge nasogastric tube is inserted. Permeability is checked. Finally, the probe is attached to the aponeurosis with absorbable thread and the skin is closed.

Our work lasted 12 months. It involved 6 patients, 4 of whom died. The 2 living patients had ages of 7 days and 12 years. Table I summarizes their characteristics.

Mortality remains high, with Sethi et al. and Finkelstein et al. reporting 70% and 50% of deaths in neonatology, respectively (14,15). We are particularly motivated by the fact that we have the same conditions for patient selection as these researchers. In our department, PD for children with ARF has saved lives and supported the «Saving Young Lives» initiative of the International Society of Nephrology (ISN).

Conclusion

The aim of this work was to give a

Table I. Main characteristics of the two surviving children with acute renal failure

Parameter	Patient 1	Patient 2
Gender	Female	Female
Age	7 days	10 years
Weight	1.2 kg at admission	32 kg at entry
Awareness	Normal	Normal
Creatininemia	Before dialysis: 580 μ mol/l After dialysis: 100 μ mol/l	Before dialysis: 1280 μ mol/l After dialysis: 870 μ mol/l
Azotemia	Before dialysis: 1 g/l After dialysis: 0.32 g/l	Before dialysis: 2.4 g/l After dialysis: 1 g/l
Evolution	Favorable	Unfavorable; evolution towards chronicity; leading to hemoconversion

brief review of the history of PD in the Republic of Congo, to draw attention to our difficulties in managing renal failure, particularly in children, to describe our current catheter implantation technique using a nasogastric tube, and to evaluate clinical results. Future prospects involve continuing and organizing the PD program in the Republic of Congo. We are pursuing acute PD

in pediatrics and plan to set up an acute PD unit for children and a chronic PD unit for adults. We appeal for support for ISN's «Saving Young Lives» initiative, which aims to save children's lives through PD.

Conflicts of interest: authors declared that they no conflict of interest with this publication.

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