



FROM THE EDITORIAL OFFICE

Dear All,

In this issue, we are delighted to have Professor SH Han from Korea to present her view on the use of glucose polymer solution. In addition, Dr. LM Ong from Malaysia will discuss his experience of PD peritonitis in Malaysia, while Dr. WX Zhang from China will share his experience of managing PD catheter malposition.

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Sincerely,
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Icodextrin, a mixture of high molecular weight, water-soluble glucose polymers isolated by the fractionation of hydrolyzed cornstarch, has widely been used as a substitute for conventional glucose-based peritoneal dialysis (PD) solutions, especially in patients who require long dwell, or need to enhance ultrafiltration capacity. The reduced glucose load of icodextrin solution is another strength and may provide some long-term metabolic advantages in diabetic patients [1]. Despite these attractive characteristics and its widespread clinical use, the effect of icodextrin on preserving residual renal function (RRF) remains controversial [2–9]. In fact, there has been concern that excessive ultrafiltration with icodextrin may induce underhydration, resulting in a faster decline in RRF. This was first raised by one randomized trial showing a greater reduction in residual glomerular filtration rate (GFR) in patients using icodextrin compared to those using glucose (1.36%) solutions [4]. In contrast, another randomized study showed that icodextrin preserved urine volume better than a glucose-based (2/27%) solution accompanied by significant improvement of fluid removal with icodextrin [5]. On the other hand, a recent systematic review of four randomized trials showed no appreciable impact of icodextrin on RRF, neither residual renal clearance nor daily urine volume [9]. However, it should be noted that the previous studies addressing this issue have provided limited evidence owing to RRF being defined as a secondary outcome, insufficient statistical power, relatively short observation period, or small sample size. These led us to assume that treatment-associated changes in volume status might differ depending on different concentrations of comparative glucose solution, thus resulting in conflicting findings. Therefore, with particular attention paid to fluid status, we recently conducted a multicenter prospective randomized controlled trial from October 2010 to June 2014 at 8 centers in Korea to clarify this unresolved issue [10].

One hundred patients with urine volume ≥ 750 mL/day were randomly assigned to receive one exchange of icodextrin solution for a ≥ 8 hour-dwell time and two exchanges of 1.5% glucose-based biocompatible neutral pH solution (n=49) or one exchange of $\geq 2.5\%$ and two exchanges of 1.5% glucose-based biocompatible solutions (n=51). Using mixed-effects general linear models, we analyzed changes in residual GFR and daily urine volume at 1 year. As shown by our data,

Icodextrin Improves Preserving Residual Urine Volume in Patients on Continuous Ambulatory Peritoneal Dialysis

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associated with significantly slower decline in residual daily urine volume up to 12 months of continuous therapy using icodextrin. The slope of the decline in residual GFR was -0.170 mL/min/month/ 1.73 m² in the icodextrin group, while it was -0.155 mL/min/month/ 1.73 m² in the glucose solution group (95% confidence interval [CI], -0.06 to 0.10 ; $p=0.701$). Of note, daily urine volume decreased faster in the glucose solution group than in the icodextrin group (-31.02 vs. -11.88 mL per month; 95% CI, -35.85 to -2.44 ; $p=0.025$). There were no differences in fluid status, peritoneal ultrafiltration, and peritoneal transport between groups during follow-up.

These findings prove the clinical benefit of icodextrin on preserving residual urine volume in PD patients, whereby residual urine volume was more preserved in the icodextrin group than in control group despite no difference in a decline rate in GFR between groups. The underlying mechanism responsible for the effects on preserving urine volume is unclear, but one potential explanation includes the presence of high-molecular-weight icodextrin metabolites in plasma, which in turn may increase plasma osmotic oncotic pressure and hence preserve plasma volume and renal perfusion [11]. There are no current guidelines that recommend the use of icodextrin solutions for the purpose of preserving RRF; however, our findings suggest that icodextrin is a promising dialysis solution for achieving important therapeutic goals, such as the preservation of residual urine volume and fluid management in PD patients. These observations further highlight the need for a more in-depth and long-term studies focusing on the underlying mechanisms of the renoprotective effects of icodextrin in patients on PD..

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Experience of Peritoneal Dialysis and Peritonitis in Malaysia

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Since the introduction of peritoneal dialysis (PD) by Ganter almost a century ago PD technology has improved considerably with development of the silicone rubber PD catheter with Dacron cuffs (Tenckhoff catheter) and introduction of collapsible plastic bag, CAPD and automated peritoneal dialysis (APD) [1].

In Malaysia intermittent PD was first used for the treatment of acute renal failure in 1966 and later extended to patients with end stage renal disease.[2] CAPD was introduced in November 1980 with the single-bag system and in 1987 ultraviolet exchange device was used to decontaminate the connection to the PD catheter. This was replaced by the double-bag Y-disconnect system in 1993 and in 2001 the connectology was further improved to incorporate a pre-attached dialysate bag. APD was introduced in 1995 but the penetration of APD remains low (13%) largely due to the higher maintenance cost.

Despite these technological improvements, peritonitis remains the Achilles heel of PD. The first published series on CAPD in Malaysia was from University of Malaya [3]. The peritonitis rate among 7 patients using the single-bag system from November 1980 to June 1982 was 1 episode in 8.4 patient-months. This was comparable to other reports during the same time period. From 1990 to 1995, the incidence of peritonitis at Kuala Lumpur Hospital, the largest public hospital in the country, progressively declined from 1 episode in 6.7 to 18.1 patient-months [4]. Over the next 15-year period from 1997 to 2012, the median peritonitis rate among PD centres in the country improved from 1 episode in 16.1 to 53.8 patient-months [5]. The improvement coincided with the introduction of the double-bag system with pre-assembled dialysate bag. Over the last 4 years, the median peritonitis rate has remained less than 0.3 episodes per patient-year (1 in 40 patient months).

Although the overall peritonitis has improved over the decades, there is considerable variation among PD centres. In 2014, peritonitis rates among Malaysian PD centres ranged from 1 episode in 27.2 to 339

patient-months (0.04 to 0.44 episodes per patient-year) with a median of 42.9 patient-months.(5) ANZDATA registry also reported wide variation in peritonitis rate.(6)

News from the ISPD

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Membership benefits of the International Society for Peritoneal Dialysis include:

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- Application for ISPD Scholarships and Grants

Please join the ISPD membership at www.ispd.org. There is a category of membership for developing countries (institutional membership) allowing 10 member from same institute to pay at one member cost.

Asia-Pacific Chapter Scholarship

This is a scholarship to support up to 3 months training in clinical PD for doctors and nurses from Asia-Pacific region. Deadline for application for each round: twice a year at 30 June or 31 December. **The next deadline is 30 December 2015.** Details and application procedures can be found under the Regional Chapters – Asia-Pacific Chapter, at the ISPD website.

Upcoming Meetings

The 8th Asia Pacific Chapter Meeting of ISPD

22-25 March 2017

Baiyun International Convention Center
Guangzhou, China

Website: <http://apcmispd2017.medmeeting.org/en>
Important dates:

Abstract submission deadline: 10 December 2016

On-line registration deadline: 15 March 2017

ISN World Congress of Nephrology

21-25 April 2017

Mexico City, Mexico

Web site: <http://www.wcn2017.org/>

Important dates:

Abstract submission deadline: 26 November 2016

Early bird registration deadline: 23 January 2017

On-line registration deadline: 20 March 2017

17th Congress of International Society for Peritoneal Dialysis

5-9 May 2018

Vancouver, Canada

Website: <http://ispd-2018-vancouver.launchrock.com/>

There are many factors that contribute to the variation in peritonitis rates including patient, centre-specific and PD system factors. Risk factors commonly reported in the literature include age, diabetes mellitus, nutritional status, obesity, smoking, Staphylococcus aureus nasal carriage, lower education level and increasing distance from PD center. The Malaysian Dialysis and Transplant Registry identified age (55 years or older) and the requirement for assistance as independent risk factors for peritonitis [5].

We conducted a prospective observation study over a period of one year in Ministry of Health PD centres to further define the risk factors

for peritonitis [6]. All reported peritonitis were subjected to adjudication by two independent nephrologists. The overall peritonitis rate was 1 episode in 44 patient-months. The predictors for peritonitis identified were race, severe obesity, Staphylococcus nasal carriage, hypoalbuminemia, duration on PD, lower patient-to-nurse ratio while APD and use of topical antibiotics at exit-site were protective.

Racial differences in peritonitis rates have also been reported in other literature. The risk of peritonitis among aborigines from Canada, Australia and New Zealand was 64-93% higher compared with Caucasian or other populations [7]. Blacks in US and Canada were reported to have a 26-62% increased risk of peritonitis. In these Western series, Asians did not have a higher risk of peritonitis. Asians are however a heterogeneous group. In our study, we tested the hypothesis that there could be differences in risk of peritonitis among ethnic groups in Asia [6]. Malaysia is a South-east Asian country comprising 3 major groups namely descendants from the Malay Archipelago (Malays), China (Chinese) and South Asia (Indians). We showed that compared to other ethnic groups, Chinese were 45% less likely to develop peritonitis. The lower risk could be partly explained by differences in demographic pattern. In our cohort, Chinese were older, had lower educational level, higher income, poorer vision and lived closer to the PD center. After adjusting for these and other variables, the risk of peritonitis was still significantly lower among Chinese with an incidence rate ratio (IRR) of 0.65 (95% CI 0.46, 0.90) compared to other ethnic groups. The difference was greatest for peritonitis due to gram positive organisms, IRR 0.47 (95% CI 0.24, 0.91).

The reasons for these differences are unclear. It is possible that the adjustment for other risk factors was incomplete due to complex multitude of factors at play. Propensity to infections may have a strong genetic influence. In a genetic study, polymorphisms in interleukin (IL)-1B and IL-1 receptor antagonist were associated with increased risk of peritonitis. In addition, polymorphism in the ficolin gene was associated with increased incidence of Staphylococcal peritonitis [8]. We should explore further if these or other genetic variations could explain the observed differences in our cohort.

In common with other reports, gram positive organisms remain the most common cause of peritonitis (33%) in Malaysia with Staphylococcus aureus being the single most frequent isolate (12%) [5]. Gram negative organisms accounted for another 28%. The culture negative rate however was still high (26%).

The incidence of PD peritonitis in Malaysia is comparable with other centres in the world. There has been marked reduction in peritonitis rates over the last three decades with advances in PD technology and improved patient care. However significant challenges remain. Quality improvement initiatives to reduce the risk and complications of peritonitis should be implemented in all PD centres. The high mortality

rate associated with peritonitis and low culture yields in the country should be addressed.

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Meeting News – PD Scientia India meeting

The Department of Nephrology hosted the annual PD Scientia India meeting on August 26th and 27th 2016 at Christian Medical College, Vellore, Tamil Nadu, India. This annual meeting, conducted under the aegis of the Peritoneal Dialysis Society of India and endorsed by the International Society of Peritoneal Dialysis aims to address the unmet need for a structured, high quality and formal scientific discussion focused around Peritoneal Dialysis for practicing nephrologists, to enable delegates to establish their own PD centres and deliver quality assured PD therapy to patients. It was attended by leading experts in Peritoneal Dialysis from across the country who by means of case-based interactive lectures and panel discussions interacted with and helped an invited list of practising nephrologists from South India. The program covered a variety of topics like patient selection, peritoneal dialysis access – insertion and troubleshooting, the need to promote PD in India, relevance of intermittent PD today, management of patients in the immediate pre- and post-catheter insertion period, formulation of PD prescriptions, PD adequacy beyond Kt/V, PET test – clinical utility and its modifications, complications – infections, mechanical complications, ultrafiltration failure, etc, PD in children, PD as rescue therapy in refractory CHF, PD in diabetics, elderly and failed transplants, Automated PD, Icodextrin and newer solutions, PD in acute kidney injury, and role of PD in managing large ESRD patient bases. All the sessions were well appreciated. The department of Nephrology, Christian Medical College expresses its sincere thanks to all those who helped make this program a success.



Group photo of PD Scientia India on 27 August.

New technology application on Peritoneal Dialysis Catheter Malposition and Blockage

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Peritoneal dialysis (PD) is an important means of renal replacement therapy for end-stage renal disease (ESRD) with a simple operation. However, PD catheter-related complication is the main reason for patients dropping out of treatment. Thereinto, malposition and blockage is the most common complications which is difficult to correct, and greater omental adhesion encapsulation currently accounts for 57%~92% of all patients and also is the most difficult problems [1]. Once inadequate drainage or perfusion develops, peritoneal dialysis catheter malposition and blockage inevitably occur. Currently, laparoscopic repair, which is more complicated and expensive, is usually adopted if non-surgical treatment modalities (such as motion, local massage and guidewire intervention) do not work. Our working group developed a novel surgical technique which was published in "Internal Medicine" (Japan) in 2016 [2].

In this paper, we present a novel surgical and investigate its safety and clinical significance for correcting refractory PD catheter malposition and blockage by loop ligature and fixation through minilaparotomy of inserted hypogastrum peritoneal dialysis catheters.

From June 2009 to June 2014, a total of 16 PD patients with PD catheter malposition and blockage in whom non-surgical treatment modalities had failed at our hospital were selected (seven men, nine women; mean age 33.4±12.6). Sudden inadequate or obstructed drainage occurred during PD, and conventional non-surgical treatment modalities did not work in one week, as well as PD catheter malposition and blockage being confirmed by X-ray. Surgical method: The original PD catheter was localized in the abdomen, and then the lower 5 cm was indicated as the incision center. Patients were given local infiltration anesthesia with 0.5% lidocaine hydrochloride. Vertical incisions approximately 3 cm long were made, blunt separation of the adipose layer using vessel forceps was performed up to the recus abdominis sheath and an incision was made. This was followed by blunt separation of the muscular layer, cutting of the anterior sheath of the rectus muscles, blunt separation of the diastasis recti abdominis and full exposure of the peritoneum, after which vertical incisions

approximately 1cm long were made. By using a dynamic radiograph, the PD catheter was slowly drawn from the abdomen through blunt-edged hook, followed by routine isolation, ligaturing and removal of the adhesive omentum majus step by step, full exposure of the PD catheter in the abdomen, and quick rinsing and removal of omental tissue in the PD catheter and ostium using 20 mL of heparin saline. PD catheters were introduced into the Dow cavity using large introducing forceps, then loop-ligated and fixed with 3# silk thread, after which the ligation line was sutured to the peritoneum and the medial border of the extra peritoneal posterior sheath; the distance between the fixed PD catheters and the suture was 1.5 cm. The peritoneum was sutured and conventional surgical treatment was adopted. Finally, the skin was sutured. 7 days days after surgery standard dose (2000ml) was performed. For all 16 cases, incisions were on the left of the abdominal medial line, including deviation to the left rear in 10 cases and deviation to the right rear in six cases, all of which were caused by omental adhesion encapsulation.

The operation is safe, simple, cheap and fewer complications. It is so exciting that we haven't found patients with malposition and blockage again. We chose a location 5-10 cm above the pubic symphysis for incision in reoperation due to the following two considerations: one is concerned with the distribution range of the greater omentum in the abdominal cavity anatomically; the other consideration is that, the lower the site of catheter fixation, the lower the passage of the catheter and the lower the likelihood that it will be affected by peristalsis.

At our center, the incidence of omental adhesion encapsulation is 7.8%, which is seen most frequently in the young. When fixing a PD catheter to the peritoneal wall using this technique at the time of PD catheter insertion before starting PD in patients aged under 45, it is possible to prevent PD catheter malposition after PD initiation, although this requires further study.

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Meeting News:

4th Annual Convention and Scientific Seminar on CAPD

The 4th Annual Convention and Scientific Seminar on CAPD was held 30-31st July, 2016 in the convention Hall of Kidney Foundation of Bangladesh. The theme was: "CAPD-the best form of treatment of ESRD in rural population of Bangladesh". There were 11 speakers from home and abroad and 200 participants attended the conference. On 2nd day, a teaching program was arranged for CAPD patients only. There were 302 patients of CAPD in Kidney Foundation hospital and research institute since July 2011. The main obstacle of CAPD is cost of fluid imported from Baxter and peritonitis. In Kidney Foundation the rate of peritonitis is 1 in 30 patient's months.

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