Trends of Peritoneal Dialysis

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Background: Peritoneal dialysis (PD) is a safe, efficient and cost-effective renal replacement therapy for patients with end-stage renal disease (ESRD). It offers many advantages to the individual and health care system. PD is the preferred modality in prospective recipients awaiting kidney transplants. PD remains underutilized worldwide.

Objective: To evaluate the trends of PD in SMC.

Design: A Retrospective Study.

Setting: Peritoneal Dialysis Centers, Ministry of Health, Kingdom of Bahrain.

Method: All patients who underwent PD line insertion from January 2015 to January 2020 were included in this study.

Result: One hundred forty-one patients had peritoneal dialysis line insertion during the study. A significant reduction in the number of line insertion was noticed throughout the years. Eighty-two (58.16%) patients had their PD lines removed due to adequacy in 30 (21.28%) patients, and transplant in 28 (19.86%). Complications were found in 18 (12.77%) patients, mainly infection and line blockage.

Conclusion: Our results revealed significant reduction in PD line insertion throughout the years. This can be overcome with infrastructure program, training younger nephrologists in PD and adequate patient education.

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There has been an increasing prevalence of chronic kidney disease (CKD) and end-stage renal disease (ESRD) due to the increasing life expectancy, risk factors and screening programs[1]. Approximately 3 million patients worldwide are affected by ESRD and require a sustained method of renal replacement therapy (RRT) such as hemodialysis (HD) or peritoneal dialysis (PD)[2-4]. Continuous Ambulatory Peritoneal Dialysis (CAPD) is the main type of PD, especially in the developing countries[5].

PD offers many advantages to the individual and healthcare system compared to other RRT modalities. It is easy to learn and does not require a partner. Patients can continue their daytime activities despite being on a nighttime PD, thus maintaining a better quality of life[6,7]. It offers the flexibility of treatment schedule, single access line, few equipment, fewer hospital visits, and does not need highly trained personal healthcare[5]. In addition, PD patients do not require anticoagulation therapy[8]. Medication could be administered via the intraperitoneal route, which provides efficacy and constant drug level[8]. Disease perception and the burden of illness are better in PD compared to HD[9]. The main contraindication for PD is a non-functioning peritoneum; it includes adhesions due to multiple surgeries, ascites, ligation of the thoracic duct and active colitis[10].

Studies support the use of PD in the management of acute kidney injury (AKI); it provides adequate control of metabolic derangement in catabolic patients and significant solute removal[11]. The International Society of Peritoneal Dialysis (ISPD) guidelines recommends the use of PD in the acute management of AKI[8]. Hemodynamically unstable patients or those who suffer from severe congestive heart failure tolerate PD better than HD[8]. PD is the preferred modality in prospective recipients[11].

Most ESRD patients present late and start dialysis in unplanned urgent manner; in such cases, HD is usually started via a central venous catheter[3]. Studies are exploring the alternative option of urgent PD[12]. Urgent PD could be a safe, efficient and cost-effective alternative; it has fewer incidences of catheter-related bloodstream infections, vascular complications, and shorter hospital stay[3,4].

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The aim of this study is to evaluate the peritoneal dialysis in SMC.

METHOD

All patients who underwent peritoneal dialysis line insertion from January 2015 to January 2020 were included in this study. All necessary data were collected retrospectively from the peritoneal dialysis center nurses. A database registry is available for all patients on peritoneal dialysis.

RESULT

One hundred forty-one patients had PD line insertion during the study period, see figure 1. All lines were inserted via the open technique by vascular surgeons. Thirty-nine (27.66%) were inserted in 2016 and six (4.25%) had re-insertion of the line. During our study period, we found a significant reduction in the number of PD line insertions throughout the years.

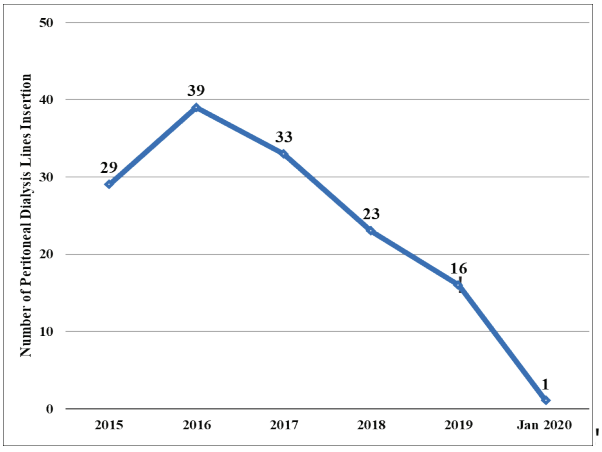

Figure 1: Number of Peritoneal Dialysis Line Insertion per Year

Eighty-two (58.16%) patients had their PD lines removed due to adequacy in 30 patients (21.28%), and transplant in 28 (19.86%). This was followed by blockage, infection, and other reasons which included the patient's request and improvement in Glomerular Filtration Rate (GFR). The highest number of kidney transplants was 12 (8.51%) patients in 2017, see figure 2 and 3.

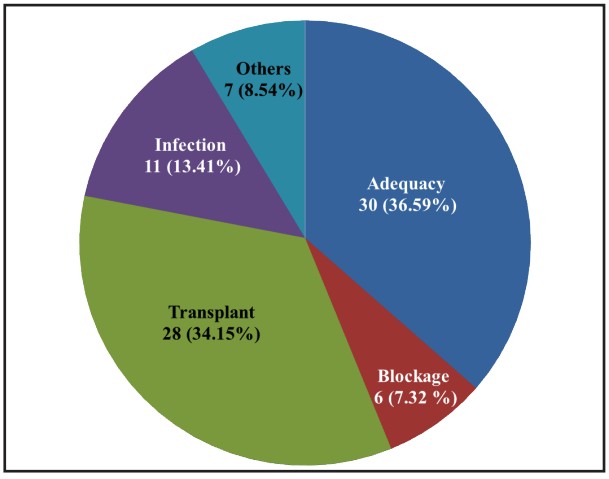

Figure 2: Reasons for Peritoneal Dialysis Line Removal (Out of 82 Patients)

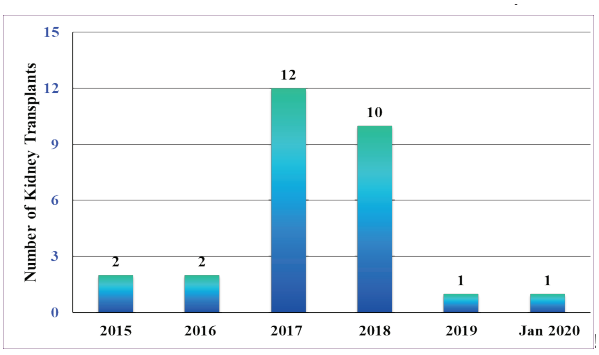

Figure 3: Peritoneal Dialysis Line Removal due to Kidney Transplant

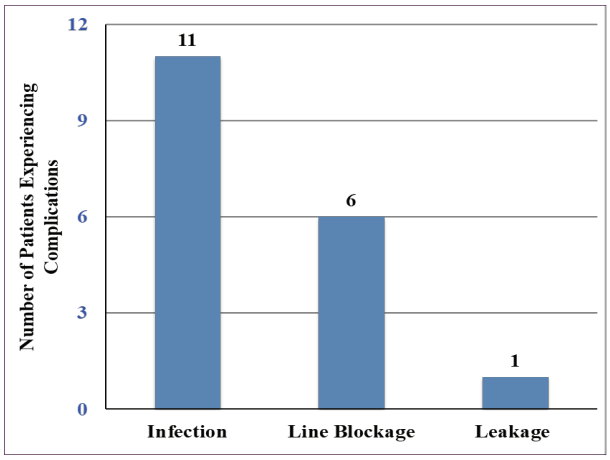

Figure 4: Complications of Peritoneal Dialysis

Eighteen (12.76%) patients had PD complications; 11 (7.80%) patients had infection and 6 (4.25%) had line blockage, see figure 4.

DISCUSSION

Worldwide less than 10% of patients are on PD and vary greatly between countries ranging from 11% to 80%[11]. In Bahrain, our current PD usage is 10.58%, which is less than our data in 2015 of 12.1%[2]. Our PD usage is higher than Saudi Arabia (7.76%) and similar to Qatar (10.7%)[14,15]. In Hong Kong and Thailand, it reaches up to 80%[11].

This study shows that PD line removal is mainly due to adequacy and kidney transplants, while in our previous study, the main reason was due to blockage[2]. Adequacy is affected by membrane flow and PD prescription by a nephrologist. Unfortunately, sufficient data regarding this reason is unavailable at our center. In this study, we found a decrease in the complication rate from 48.2% to 12.8%. Nevertheless, peritonitis remains the main complication, which is similar to another study[16]. Kidney transplant had increased from 6.7% in 2015 to 22.6% in 2020.

There was a significant decline in the number of patients undergoing line insertion throughout the years, from 39 (27.66%) in 2016 to 16 (11.35%) by the end of 2019. The trends in the usage of PD have also been decreasing globally. Studies are evaluating the reasons[1,4,5]. An educational program before establishing a dialysis method is essential. It provides the patient with adequate information enabling him to choose the most suitable method. The role of the nephrologist in this

program highly influences the patient's final dialysis choice[15]. Majority of the patients started on HD do not recall having adequate information about home PD. Given the education, a substantial proportion would choose PD[11]. In developed countries such as the United States, it was found that low usage of PD was due to inadequate dialysis modality education rather than contraindications to PD inititation[11]. This may not always be available especially in urgent acute cases; however, it is desirable and encouraged[11].

Studies have highlighted the importance of training the nephrologist in PD to eliminate biases[15]. The infrastructure and educational program should be emphasized. For the program to be successful, safe, and compassionate to every patient, it requires adequate infrastructure, expertise, and a good organization with the dialysis team of surgeons, nephrologists, dialysis nurses and technicians[15].

CONCLUSION

PD remains a safe, effective and cost-effective method of RRT. In our study, we found a significant decline in PD line insertion throughout the years. Our findings are consistent with the global reduction in PD usage. This can be overcome with infrastructure program, training younger nephrologists in PD and adequate patient education.

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