Components of A Successful Peritoneal Dialysis Program

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Summary: Although varying widely among different countries and geographic regions, the development of peritoneal dialysis invariably requires a well-established program. Key ingredients for the successful delivery of this therapy include adequate chronic kidney disease education, governmental or nongovernmental reimbursement, qualified physicians and nurses trained in the principles and practice of peritoneal dialysis, clinical management that incorporates an excellent and well-trained peritoneal dialysis team, a feasible and well-designed program for catheter insertion, a sound patient training and follow-up scheme, and continuous quality improvement. Some programs are enhanced by an active clinical research portfolio and other appropriate supportive systems. All of these factors are interlinked and inseparable from one another in ensuring a high-quality peritoneal dialysis program.

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The high prevalence of chronic kidney disease (CKD) and the growing population with end-stage renal disease (ESRD) worldwide emphasize the need for options for patients for modalities of renal-replacement therapy.[1] Clinical studies have shown that as a home-based dialysis therapy, peritoneal dialysis (PD) has many advantages including longer preservation of residual renal function, lower hemodynamic stress, possibility of better patient survival, relatively high quality of life, and greater capacity to serve more ESRD patients owing to its cost savings and lower infrastructure requirements.[2] The rapid growth of the ESRD population in the presence of limited resources necessitates strategies to maximize the use of less expensive PD while simultaneously improving clinical outcomes. To establish a successful PD program, several important elements such as adequate CKD education, reimbursement for the therapy, physicians and nurses trained in the principles and practice of PD, clinical management, continuous quality improvement, as well as adequate supportive systems are to be considered.[3,4] This review discusses the components of a successful PD program.

ADEQUATE CKD EDUCATION PROGRAMS

To optimize the use of a self-care modality such as PD, predialysis education for CKD patients is imperative. Education on therapeutic options will enable patients to understand more about PD, thus allowing them to make better-informed choices about dialysis modalities.[5] Meanwhile, even though the mortality rates of dialysis patients has decreased in the past decades, the rates remain high and these patients suffer significant morbidity. However, studies have shown that patients' knowledge about therapy options and their understanding of the disease are limited.[6]

Given the importance of patient involvement in therapy, the value of predialysis education cannot be overemphasized. Patient education has been shown to improve the clinical outcomes of many chronic diseases such as diabetes mellitus.[7] CKD is incurable and if it progresses to ESRD, it requires life-long renal-replacement therapy, and for it to be successful, requires critical careful and continued self-management by patients. Patient education is the first step to improve clinical outcomes in a PD program.[8-11] In a single-center randomized clinical trial, it was shown that predialysis education greatly increased the number of patients planning to choose a home modality.[12] Similarly, in a study from Taiwan, multidisciplinary patient education increased the proportion of patients who chose treatment with PD.[13] In addition, Fresenius Medical Care, North America started a nationwide education program (TOPs) to educate predialysis patients and their families about modality selection for renal-replacement therapy. With this

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education, one of every four patients who attended the TOPs session selected a home therapy, among which PD was predominant. The use of PD was almost eight times higher among TOPs-educated patients than among those who did not participate in the program.[14]

Besides the increase in the number of patients choosing PD as a dialysis modality, there are substantial other benefits to patient education. Studies have shown that the effect of CKD education on the management of dialysis patients could be potentially greater than that of many other therapeutics.[15] Two randomized controlled clinical trials from Canada showed that predialysis CKD education could delay the need for dialysis and was associated with decreased short- and long-term mortality.[10,12] In a study of a predialysis psychoeducational intervention in CKD patients with 20 years of follow-up evaluation, the intervention extended overall survival by 2.25 years and a median of 8.0 months longer after the initiation of dialysis therapy.[10] In addition, TOPs participants had a 39% lower adjusted risk for death within the first 90 days from the start of maintenance dialysis.[14] Similarly, a lower mortality rate was achieved in a Taiwan study using a predialysis multidisciplinary education program.[13] Among the participants of the US National Kidney Foundation Kidney Early Evaluation Program, a community-based screening and education program, participants had higher rates of pre-ESRD nephrologist care, treatment with PD, and a lower mortality rate.[16]

Thus, participation in a CKD education program is associated with higher rates of use of PD and better survival. Hence, predialysis education is critical in building a successful PD program.

THE REIMBURSEMENT POLICY

The national reimbursement policy is the most important nonmedical factor contributing to modality selection and the reimbursement favoring PD could offer financial incentives in the drive for rapid expansion of PD programs.[17,18] It is well known that the highest penetration rate of PD (76% of the dialysis population in 2010) is a consequence of the PD-First policy adopted in Hong Kong since the mid-1980s. The PD-First policy meant that all ESRD patients had to be treated with PD first unless they had a medical contraindication to do so. As a result, the PD-First policy fed into a rapid expansion of dialysis services while keeping costs lower than they would have been in a system that allowed for free patient choice. This way the Hong Kong government could support more patients with ESRD who required dialysis.[19,20] In Japan, government revenue is the main source of funding for dialysis. Fee-for-service remuneration systems for dialysis in Japan encourages the use of HD because physician or hospital income is related directly to the number of patient visits: HD patients make more frequent visits to doctors and hospitals. Insurance policies favoring HD could undermine PD utilization.[21] The Japanese facility survey showed that the dialysis population has been growing every year: it was 314,438 at the end of 2013. Among the entire dialysis population, only 3% were PD patients.[22] In the United States, the improvement in outcomes of PD patients makes a compelling argument for its expanding utilization as a therapy for ESRD.[23] The implementation of the Medicare-expanded prospective payment system that started January 1, 2011, for the care of ESRD patients in the United States rapidly has reversed the decrease in the proportional utilization of PD.[24] Utilization of PD has been growing at a much higher rate than that of HD.[17,24] Comparing the first quarter of 2010 and the fourth quarter of 2012, the prevalent count of patients on PD increased by 24%, while the corresponding increase in HD patients was only 9.6%. Furthermore, there has been a striking increase in PD use, with a prevalence of 9.7% in 2014. This rapid expansion is yet more evidence that reimbursement policies have a significant influence on the utilization of PD.

Mainland China has a large land mass with a large population. This, in turn, contributes to limitations in medical resources for economic reasons, particularly in outlying agricultural areas. The growing number of ESRD patients in China is placing a profound socioeconomic burden on the government and its health care system. To maximize the coverage of renal replacement treatment for ESRD patients and benefit more patients, administrative interventions have been taken to encourage PD utilization. The National Development and Reform Commission of China added a series of entries regarding PD in its latest catalog of treatments and diagnoses. Thanks to the guidance of the government, supportive policies, and promotion by professionals, PD utilization has been growing rapidly. Nationwide, there currently are some 900 hospitals equipped with the ability to support PD. The number of patients on PD throughout the country was approximately 7,000 in 2003, 16,000 in mid-2008, and exceeded 50,000 at the end of 2014, an annual growth rate that now exceeds 20% (Fig. 1).[25-27] As a result, China now has the largest PD population in the world, which is related partly to the implementation of government policies with strong reimbursement incentives.

STANDARD TRAINING FOR NEPHROLOGISTS AND NURSES

The quality of life and survival of PD patients has improved significantly in recent decades.[28-31] Despite the advantages associated with this modality, it has not been embraced as it deserves to be in many countries. An important reason may be the insufficient