ROLE OF A CENTER OF EXCELLENCE PROGRAM IN IMPROVING THE QUALITY OF PERITONEAL DIALYSIS—A CHINESE EXPERIENCE

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Improving the quality of peritoneal dialysis (PD) in areas with a rapid increase in PD patient numbers constitutes the most significant PD challenge in China. Here, we share our experience of implementing a quality improvement program in 8 PD centers, with guidance from matched experienced centers.

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In line with the policies of the National Health Bureau and the Chinese Society of Nephrology, peritoneal dialysis (PD) is now growing faster in China than in most other countries. It is estimated that, at the beginning of 2012, approximately 40 000 patients in China were on PD, constituting the second-largest PD population in the world (Baxter Healthcare. Data on file, 2013).

Recently, the quality of PD in China has improved significantly. Reports place 1-year patient survival at 90% – 100% (1–3); 5-year survival, at 51% – 64% (1,2); and the peritonitis rate at 1 episode in 61 – 68.5 patient-months (1,3). In the centers to which these reports refer, the average duration of PD was 30 – 45 months. However, in many other PD centers in China, quality indices such as the peritonitis rate are not as good (4). We hypothesized that the differences might relate to gaps in knowledge and experience concerning the management of PD patients, providing an opportunity to study the impact on clinical outcome of a transfer of expertise and knowledge between centers.

In 2003, when only 5 PD centers in China were caring for more than 60 patients, Baxter initiated a domestic center of excellence (COE) program, characterized by the goal to become a “best demonstrated practice” unit. Within a

couple of years of the COE program being introduced, most centers reported an improvement in quality parameters, which likely contributed to an increase in the number of larger-volume centers to more than 100. Here, we describe the impact of the introduction of this mentor-based COE program, in which 8 selected PD centers received help and support from experienced PD centers in 2012.

METHODS

SELECTION CRITERIA FOR MENTEE PD CENTERS

Based on past experience, it was understood that the most motivated centers were those that would gain the most from joining the COE program. Mentee (“learning”) centers were therefore selected in December 2011 using these criteria:

- Having quality indices, such as a drop-out rate (DOR) and time on therapy (TOT) lower than the national average
- Having a strong willingness to improve PD outcomes

Eight centers met the criteria. One center, site 7 (Table 1), had limited experience with PD; in the remaining centers, the PD prevalence was 36 – 107 patients (Table 1). In the 8 units, either no patient files were maintained at the center (medical records were kept by the patients) or no regular review meetings or clinic follow-ups were held before implementation of the COE program in December 2011 (Table 1).

MENTOR CENTERS

The COE mentor (“coaching”) centers were identified at the beginning of 2012. Notably, our mentor model was different from the satellite center model at Sun Yat-sen University (Guangzhou, China) where one mentor center (the university PD unit) is responsible for training dozens of mentee centers (4). In our model, each mentor center is responsible for only 1 mentee site. Thus, 8 PD

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TABLE 1
Comparison of Outcomes Before and After Implementation of the Centers of Excellence (COE) Program
in the Mentee Centers

Site ID	Pts (n)	Before COE program (December 2011)					Pts (n)	After COE program (November 2012)				
		Time on therapy (months)	Drop-out rate (%)	Patient record ^a	PD meeting ^b	Follow-up ^c		Time on therapy (months)	Drop-out rate (%)	Patient record ^a	PD meeting ^b	Follow-up ^c
1	36	20.4	30.2	No	No	No	57	15.7	13.3	Yes	No	No
2	60	6.3	25.3	No	No	No	77	8.0	20.5	Yes	Yes	Yes
3	106	27.8	23.1	No	No	No	123	31.7	19.6	Yes	No	Yes
4	81	20.4	41.3	No	No	No	111	19.6	35.3	Yes	Yes	Yes
5	106	20.7	35.6	No	No	No	131	24.7	24.6	Yes	Yes	Yes
6	77	21.5	42.2	No	No	No	87	21.5	34.4	Yes	No	Yes
7	4	—	—	No	No	No	22	4.6	16.7	Yes	Yes	Yes
8	107	21.7	27.2	No	No	No	127	20.4	37.7	No	No	Yes

Pts = patients; PD = peritoneal dialysis.

^a Site collected patient records stored at the center.

^b Site held a regular PD meeting.

^c The PD patients were followed by a PD team.

physicians from experienced centers geographically close to the assigned mentee centers were invited to participate. The mentor centers were selected based on their best-in-class PD clinical outcomes and willingness to participate in the program (Table 2).

PROGRAM DEVELOPMENT

An agreement was made between each of the center pairs. Baxter China helped to organize and facilitate the program. The first project meeting was held in May 2012. At that meeting, the mentee centers presented the barriers and challenges they experienced with respect to PD quality. The mentor and mentee centers jointly prepared detailed plans for implementing center-specific programs to address the main issues put forward by each mentee center. Table 3 summarizes the core elements of the curriculum used in coaching the mentee centers.

Mentor centers were responsible for using standardized teaching materials to deliver lectures, lead PD case discussions and ward rounds, suggest key performance indicators, and initiate a continuous quality improvement program. All centers reconvened in November 2012 to share the experiences of the first 6 months of the COE program (Figure 1).

KEY PERFORMANCE INDICATORS

Each of the sites used the TOT (in months) and DOR metrics to measure outcomes. Those metrics were calculated as follows:

TABLE 2
Quality Indices and Center Size in
Mentor Centers,
May 2012

Mentoring center ID	Time on therapy (months)	Drop-out rate (%)	Center size	Assigned mentee center
1	24.4	20.3	>500	Site 1
2	27.1	24.9	200–300	Site 2
3	28.3	17.3	>500	Site 3
4	45.3	17.8	300–400	Site 4
5	43.4	21.5	300–400	Site 5
6	43.2	19.0	400–500	Site 6
7	26.5	21.6	>500	Site 7
8	28.2	20.6	200–300	Site 8

TOT = total patient-months / dropouts, and

DOR = dropouts / $[N1 + (1/2) \times N2 - (1/2) \times N3]$,

where “total patient-months” is the total number of months on PD for patients who withdrew, N1 is the initial number of patients, N2 is the number of new patients during the preceding 12 months, N3 is the number of patients who left for any reason (death, transfer to hemodialysis, transplantation) during the preceding 12 months, and “dropouts” is the patients who stopped PD during the preceding 12 months. The monthly transplantation rate in the mentee centers was very low (<1%) and stable during the study period.

TABLE 3
Curriculum Recommended in the Program

- Standard setting of a peritoneal dialysis (PD) center
- Roles and responsibilities of a PD team
- Skills for catheter insertion
- Patient training
- Monthly PD review meeting
- Recommendations for long-term follow-up
- Key performance indicators in a PD program
- The role of continuous quality improvement in managing a PD center
- PD research

RESULTS

IMPLEMENTATION OF THE COE PROGRAM

Within 6 months, the mentor centers implemented most of the agreed-upon training activities. The training was conducted at least 3 times in all units. Between May and November 2012, 7 of the 8 mentee centers started keeping patient records in-house, and 7 involved the experienced PD physicians in clinic follow-ups (Table 1). Half the centers commenced routine monthly review meetings that included case discussions and continuous quality improvement (Table 1). The most common training topics were those related to recommendations about long-term follow-up, monthly review meetings, and key performance indicators. The least common topic was proposed PD research.

PATIENT NUMBERS, TOT, AND DOR

In 7 centers, the DOR declined, and in 3 centers, the TOT lengthened. Only in 1 center did these parameters not improve (Table 1). Patient numbers increased in all units, with an average increase of 28% (Table 1).

DISCUSSION

Our main finding is that the one-to-one training model was effective and beneficial for bettering the TOT and DOR in mentee centers. Those results are probably attributable to an enhanced capability to solve clinical problems and improved center management skills. The increase in patient numbers is also probably related to the improvement in outcomes.

Considering the encouraging results from the COE program, a broader implementation of this COE model appears relevant. However, it is important that any expansion consider the need to appropriately match

Figure 1 — The development of the current Center of Excellence (COE) program: a stepwise process.

mentor and mentee centers. Matching has to take into account the specific profile and expertise of the mentor center and the unique unmet needs of the mentee center. Moreover, centers motivated to learn and interested in PD are key to a successful COE program. In the centers that demonstrated higher levels of program engagement and motivation (sites 2 and 5, for instance), the quality indices changed more than they did in the other units. With respect to the mentor centers, prerequisites are broad experience in clinical management of PD patients, excellent outcomes, and sufficient program size. Geographic proximity between the two sites also simplifies the required frequent interaction. Other requirements include having a well-designed training program, adequate teaching materials, and a monitoring software program to assist with and simplify data collection. A simple tool for calculating key performance indicators such as TOT, DOR, and the peritonitis rate was developed and provided to the mentee centers, where the PD nurses updated patient information and provided the data for review using the tool. The process takes only 1–2 hours every month. Those data were critical to the continuous quality improvement process, providing valuable feedback on progress.

This specific COE program still has some limitations. Interestingly, certain infrastructure-related matters—such as a lack of dedicated PD physicians and a high turnover rate among the PD nurses (for example, in mentee site 8)—significantly impeded the efficiency of the program. Also, China still lacks a user-friendly registration system for collecting, reporting, and analyzing data, which imposes an additional workload on the PD staff. With regard to the outcome of the program, it is important to recognize that DOR and TOT are both affected by rapid changes in patient numbers. When a center experiences fast growth in the PD population, the DOR may decline without a concomitant improvement in outcomes. Finally, the question of how long the mentor center should continue to provide training is pertinent. Further studies are therefore needed to identify the optimal training duration and the most cost-effective way to expand a COE program.

CONCLUSIONS

A COE program can be an appropriate model to improve the quality of PD in dialysis centers.

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DISCLOSURES

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REFERENCES

1. Fang W, Qian J, Lin A, Rowaie F, Ni Z, Yao Q, *et al.* Comparison of peritoneal dialysis practice patterns and outcomes between a Canadian and a Chinese centre. *Nephrol Dial Transplant* 2008; 23:4021–8.
2. Dong J, Li Y, Yang Z, Luo J, Zuo L. Time-dependent associations between total sodium removal and mortality in patients on peritoneal dialysis. *Perit Dial Int* 2011; 31:412–21.
3. Yang X, Mao HP, Guo QY, Yu XQ. Successfully managing a rapidly growing peritoneal dialysis program in Southern China. *Chin Med J (Engl)* 2011; 124:2696–700.
4. Jiang Z, Yu XQ. Advancing the use and quality of peritoneal dialysis by developing a peritoneal dialysis satellite center program. *Perit Dial Int* 2011; 31:121–6.