

Nephrology Postgraduate Training in Peritoneal Dialysis: An Online Survey

Abstract

Introduction: One of the reasons for the peritoneal dialysis (PD) underutilization is related to the training of nephrology postgraduates in PD. This notion is not yet investigated in our country. **Methods:** We gathered the emails of the heads of the departments of nephrology of all medical colleges and the institutes, which impart DM nephrology post-graduation. We sent the questionnaire framed on the postgraduate training of PD. We received the questionnaire responses anonymously. The broad headings in the questionnaire are information on training resources, training activities, perceived adequacy of the training, and the factors, which limit the utilization of PD. **Results:** There are 42 medical colleges and institutes (excluding Sri Venkateswara Institute of Medical Sciences) that impart DM nephrology post-graduation in our country. Of these, 30 heads of the departments had responded. More than half of the heads of the department felt that the PD training postgraduates were inadequate. When asked to describe the reason for the perceived inadequacy of PD training, the primary reason noted included was insufficient numbers of PD patients (66.67%). **Discussion:** The conclusion may be drawn from our study that the postgraduate training in PD in our country is gratifying. Our hypothesis that a lacuna in postgraduate training in PD may be one of the reasons for the underutilization of PD seems ungrounded.

Keywords: Hemodialysis, nephrology, peritoneal dialysis, postgraduate training

Introduction

The number of end-stage renal disease patients on peritoneal dialysis (PD) is not on the rise in India, in fact showed a declining trend. The approximate number of patients on PD in 2012 was 7800 and at the end of 2018, the number of patients was 5800. The stark fact, however, is that the wane in numbers occurred when the number of nephrologists in India is increasing. One of the reasons for the decline in numbers could be the considerable support offered to the hemodialysis program by the governments. It could be argued PD underutilization is related in part to the training of nephrology postgraduates in PD. This notion though not yet investigated in our country stems from the attribute that of 67 nephrology-training institutes (DM and DNB nephrology) in India, only a few institutes regularly practice PD in India. The lack of exposure to PD during postgraduate training reduces competence and comfort. An obvious influence on patient's management is the nephrologist's preferences to treatment

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modality. The reason for this lacuna, if it is present, in postgraduate training in PD in these institutes and medical colleges has not been studied till now.

Methods

We received the approval of the institutional ethics committee vide IEC number 796 dated 5/9/2018. We framed a questionnaire (supplementary file) on one of the survey websites. The broad headings in the questionnaire are information on postgraduate training resources in PD, postgraduate training activities in PD, perceived adequacy of the training in PD for postgraduates, and the factors which limit the utilization of PD. The questionnaire took approximately 15 min to complete.

Senior nephrologists, three, cross-checked the questionnaire. We did a preliminary survey with the questionnaire by sending to three retired professors of nephrology. Based on their suggestions, we added a question and improved the language of the questions. Before the inception of the study, we deliberated the idea of a survey of the postgraduates of nephrology. But

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there is a risk of all postgraduates of one nephrology unit, department or program to give similar results after an internal discussion among them. We respected the fact that the head of the departments shall be the best representative of their department. We gathered the emails of the heads of the departments of nephrology of all medical colleges and the institutes, which impart DM nephrology post-graduation. We sent the questionnaire by the survey website to them. We encouraged a few heads of the departments of nephrology to take part in the survey. We received the questionnaire responses anonymously. We offered no incentives.

Statistics: We provided descriptive statistics (frequencies, proportions, averages, standard deviations, and ranges) for all study data. We used the student *t*-test for the continuous variables and the Chi-square test for the categorical variables.

Results

We sent the questionnaire to all except to the head of the department of nephrology at Sri Venkateswara Institute of Medical Sciences. The study period was between June 2018 and January 2019. There are 42 medical colleges and institutes (excluding Sri Venkateswara Institute of Medical Sciences) that impart DM nephrology post-graduation in our country. Of these, 30 heads of the departments had responded. The remaining heads of the departments did not respond despite two email reminders. Tables 1 and 2 showed the training resources and activities, respectively.

We present self-reported hemodialysis (HD) and PD training resources in Table 1. The number of the faculty specially trained in PD was significantly lower compared to the number of the faculty specially trained in HD. The number of patients from whom the postgraduates could learn was also significantly lower in PD when compared to HD. The heads of the departments showed that the mean number of hours of didactic teaching lectures by faculty or seminars by the postgraduates in 3 years was also significantly lower for PD when compared to HD. The learning of PD was also constrained by the significantly lower number of days of rotation for nephrology postgraduates in PD wards and outpatient department than in the HD wards and outpatient department.

Table 2 presented the data on the training activities of nephrology postgraduates in PD. Not over one postgraduate

per year had attended a conference on PD from an institution. Only twelve institutions had a publication by the postgraduates on a PD topic in the last 3 years. The institutions with over one publication were the same ones with one publication in a year. We found the standard textbooks of PD and one of the three journals of PD was available in most of the institutions. The postgraduates appeared to receive training in fundamental procedures essential to the PD, like peritoneal equilibration test, training in hand hygiene, percutaneous placement of PD catheter, and exit site care. The calculation of Kt/V for PD patients and peritonitis rates, however, appeared to be low.

Table 3 showed the perceived adequacy of PD training. More than half of the heads of the department felt that the PD training of postgraduates was inadequate. However, an overwhelming number of heads of departments felt that HD training for postgraduates was adequate. When asked to describe the reason for the perceived inadequacy of PD training, the primary reason noted included: insufficient numbers of PD patients (66.7%). Lack of training for faculty and faculty not comfortable with PD did not form major reasons. The most frequently cited number of new PD patients per residents would be sufficient for adequate PD training in the 3-year period. In an equal number of heads of departments (eight, 26.67%) felt that the number of patients required should be over 20 and between 5 and 10.

Table 4 shows the data on the factors, which limit the utilization of PD. The heads of departments most often cited lack of patient education on PD, poor personal experience with PD, lack of nursing expertise to support PD, and proliferation of HD centers as the factors, which limited utilization of PD. More than 50% of respondents also cited limited physicians training in PD also as one of the limiting factors.

Discussion

The study is prompted when we realized that the proportion of ESRD patients on PD had declined in our country as compared to HD though the proportions were never comparable since the inception of these two renal replacement therapies. The nephrologist should be the ardent advocate of the PD for the PD to reach a dominant position. This is, in fact, true for any domain. Unless a postgraduate receive appropriate training during the 3-year period, the possibility of practicing PD after the completion of the post-graduation is slim. This is first of its kind study from our country.

Table 1: Training resources: PD versus HD

Characteristic	Peritoneal dialysis	Hemodialysis	<i>P</i>
Number of faculty specially trained	1.1±0.9	4.5±2.1	0.03
Number of patients	43.4±40.26	183±98.61	0.0001
Number of hours of didactic teaching lectures by faculty/seminars by residents in 3 years dedicated to	94.29±208.6	123±216.4	0.028
Number of days of rotation for Nephrology postgraduates in wards/op	82.43±109	119.6±85.51	0.001

The results of the study showed quite a few surprises, which dispel the belief that the PD training in our DM Nephrology postgraduate institutes is not robust. We realized that in our country at least thirty institutions have credible PD training for postgraduates. In each of these institutions, over 40 PD

patients were available for postgraduate training and the institutions gave postgraduates over 80 days of rotation in PD [Table 1]. Postgraduates need to be involved in the care of a minimum number of patients during the course of their training to gain the minimum amount of experience necessary to provide care independently to patients. The availability of patients is not only be the criterion but also it should translate to the quality of training of postgraduates. In an opinion-based article, it was called for that each postgraduate needs to be involved in the care of at least 10 HD and 10 PD patients.^[1] The number of days of rotation for nephrology postgraduates in PD wards and outpatients, when proportioned to the 3-year postgraduate period was 7.5% (36 months × 30 days divided by 82 days of the rotation in PD wards and outpatients). For HD, the same was 11% (36 months × 30 days divided by 119 days of the rotation in PD wards and outpatients). The difference was not significant ($P > 0.05$). The total proportion of the days in dialysis—PD and HD together—had been less than 25%. The postgraduates, therefore, appear to dedicate more time on clinical nephrology, renal transplant, research and thesis.

Most of the heads of departments felt that PD training could be inadequate for the lack of enough patients. Heads of the departments identified that the major potential limiting factor to use PD is the lack of patient education on PD [Table 4]. The onus to inform and to enlighten patients the usefulness of PD is on the faculty of the departments. However, 66.6% of the heads of the departments had poor personal experience with PD and sounded biased. This sets up an adverse cycle since new ESRD patients' treatment choices are often influenced by their physicians,^[2,3] while some have mentioned that the choice of dialysis modality selection is driven by patient preference.^[4,5] Wuerth *et al.* reported that 83% of interviewed patients indicated that their physician influenced their ESRD treatment choice.^[3] Of note is Stack's finding that patients' autonomous in the

Table 2: Training activities

Question	Peritoneal Dialysis
How many residents attend conferences/CMEs on PD per year	1±0.8
How many residents have published an article on PD in the last 3 years	
A. 1	12 (40.00%)
B. 2	12 (40.00%)
C. 3	04 (13.33%)
D. 4	02 (06.67%)
Which of following text books on PD are available to the residents	
A. Nolph and Gokal's text book of PD	24 (80.00%)
B. Peritoneal dialysis-Primer	20 (66.67%)
C. Others	02 (06.67%)
Which of the following journals dedicated to PD are available to residents	
A. Peritoneal Dialysis international	14 (46.67%)
B. Indian Journal of Peritoneal Dialysis	28 (93.33%)
C. Advances in Peritoneal Dialysis	04 (13.33%)
In your PD program, are the following regularly performed to PD patients	
A. Peritoneal Equilibration Test	28 (93.33%)
B. Kt/V for PD patients	20 (66.67%)
C. Calculation of peritonitis rates	16 (53.33%)
D. Training in hand hygiene to the residents/faculty	30 (100%)
E. Percutaneous placement of PD catheter	24 (80.00%)
F. Exit site care	30 (100%)

Table 3: Perceived adequacy of the peritoneal and hemodialysis

Question	Peritoneal Dialysis	Hemodialysis
Is training of a Nephrology resident adequate?		
A. Yes	14 (46.67%)	28 (93.33%)
B. No	16 (53.33%)	02 (06.67%)
If your answer to the previous question is No, please specify the reasons		
A. Insufficient number of patients	20 (66.67%)	16 (53.3%)
B. Lack of training for faculty	02 (06.67%)	04 (13.3%)
C. Faculty are trained but not comfortable	08 (26.66%)	10 (33.3%)
How many new PD patients per residents would be sufficient for adequate PD training in 3-year period, in your opinion		
A. 5	0	-
B. 5-10	08 (26.67%)	
C. 10-12	14 (46.67%)	
D. >20	08 (26.67%)	

Table 4: Factors which limit utilization of PD

Question	Response
Which of the following factor(s) can potentially limit utilization of PD	
Limited physicians training in PD	16 (53.33%)
Poor personal experience with PD	20 (66.67%)
Problems with hospital support for PD	12 (40.00%)
Hospital support for HD	10 (33.33%)
Lack of nursing expertise to support PD	20 (66.67%)
Lower physician reimbursement for PD	08 (26.67%)
Lack of PD infrastructure, dedicated resources, and support	14 (46.67%)
Lack of patient education on PD	26 (86.67%)
Other patient-related barriers	18 (60.00%)
Concern about PD clinical outcomes, relative to HD outcomes	12 (40.00%)
Concern about mortality rates with PD	10 (33.33%)
No barrier	02 (06.67%)
Proliferation of HD centers	20 (66.67%)

ESRD treatment decision-making process was more likely to receive PD rather than HD compared to patients whose medical team was more actively involved in treatment modality decision making.^[6]

In addition, the proliferation of the standalone HD units might have shifted the preferences of the nephrologists [Table 4]. In some institutions, the patients on HD who had multiple vascular access failures have been initiated on PD. Hence, substantial and bustling HD units may, in fact, nurture the PD unit.

The other limiting factors [Table 4] such as problems with hospital support for PD, lack of PD infrastructure, dedicated resources and support, and lack of nursing expertise to support PD, might be surmounted by increasing the numbers of the PD patients. More patients on PD would prioritize the attitudes of the hospital administration toward PD. The physician reimbursement for PD would also rise once the patient numbers on PD are improved. The two factors, the concern about PD clinical outcomes, relative to HD outcomes and the concern about mortality rates with PD had ranked low as the factors limiting PD utilization underlining the fact that most of the heads of the departments believe that the patients' survival on PD is like that of the HD. The opinion of the heads of the departments that the clinical factors are not the impediments to the utilization of PD vis-à-vis HD is reassuring news.

The postgraduate training activities in PD appeared adequate [Table 2]. In the majority of the departments, the standard textbooks of PD and at least one journal dedicated to PD were obtained for PD training. The peritoneal equilibration test, training in hand hygiene to the residents/

faculty, and percutaneous placement of PD catheter were performed in more than 80% of the institutes [Table 2].

The opinion on the number of new PD patients per residents that would be sufficient for adequate PD training in 3-year period was divided [Table 3]. The understandable fact is any program would flourish into a thriving activity only with the more number of patients. If more number of patients translates to different manifestations of a common condition and more number of presentations of an uncommon condition, then the diagnosis would be speedier and unflinching.

There are a few important limitations of our study. First, the response rate from the heads of the departments was not complete: only 71.4% (30 out of 42) answered the questionnaire. However, given the voluntary nature of the survey, we are encouraged by this response rate. The second limitation relates to the accuracy of the data obtained from this present survey. This is largely applicable to the distribution of time spent by postgraduates in PD and HD. This may be based on estimates made by the heads of the departments, rather than documentation of time spent by individual postgraduates. However, because heads of the departments are intimately involved in designing the structure of training in most programs, we are confident that they provided reliable estimates. We had not included faculty and directors managing DNB nephrology, who function in a different realm. We plan to initiate a similar study for DNB nephrology postgraduates also. We also agree that we failed to include the insurance facility as one of the limiting factors for utilization of PD.

The conclusion may be drawn from our study that the postgraduate training in PD in our country is gratifying. Our hypothesis that a lacuna in postgraduate training in PD may be one of the reasons for the underutilization of PD seems ungrounded. The reasons for the postgraduates who received commendable training in PD to be averse, if indeed, to the PD practice after graduation should be the subject for future study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Questionnaire on Peritoneal Dialysis Training for Nephrology Residents/Postgraduates- Dm

1. Name of the Professor/Head of the department (optional):
2. Name of the Institute (optional):
3. Number of faculty in Department (All cadres):
4. Number of faculty who receive special training in peritoneal dialysis:
5. Number of faculty who received special training in hemodialysis:
6. Number of patients on hemodialysis (MHD):
7. Number of patients on peritoneal dialysis:
8. Number of hours of didactic teaching lectures by faculty/seminars by residents/postgraduates dedicated to hemodialysis to a resident in 3 years:
9. Number of hours of didactic teaching lectures by faculty/seminars by residents/postgraduates dedicated to peritoneal dialysis to a resident in 3 years:
10. Number of days of rotation for Nephrology residents/postgraduates in hemodialysis wards/hemodialysis op:
11. Number of days of rotation for Nephrology residents/postgraduates in peritoneal dialysis wards/peritoneal dialysis op:
12. Is training of Nephrology residents/postgraduates in hemodialysis adequate?
13. a) If YES please specify the reasons:
b) If the answer to question (12) is NO, could any of these choices are possible
 - I. Insufficient number of hemodialysis patients
 - II. Lack of training in hemodialysis for faculty
 - III. Faculty are trained but not comfortable
14. Is training of Nephrology residents/postgraduates in peritoneal dialysis adequate?
15. a) If YES please specify the reasons
b) If the answer to question (14) is NO, could any of these choices are possible
 - I. Insufficient number of hemodialysis patients
 - II. Lack of training in hemodialysis for faculty
 - III. Faculty are trained but not comfortable
16. How many months of training in peritoneal dialysis per residents/postgraduates would be sufficient?
 - a. 2 months
 - b. 4 months
 - c. 6 months
 - d. Suggest:
17. How many new peritoneal dialysis patients per residents/postgraduates would be sufficient for adequate peritoneal dialysis training in 3-year period?
 - a. 5
 - b. 5-10
 - c. 10-12
 - d. >20
18. Which of the following factor(s) can potentially limit utilization of peritoneal dialysis?
 - a. Limited physicians training in peritoneal dialysis
 - b. Poor personal experience with peritoneal dialysis

- c. Problems with hospital support for peritoneal dialysis
 - d. Hospital support for hemodialysis
 - e. Lack of nursing expertise to support peritoneal dialysis
 - f. Lower physician reimbursement for peritoneal dialysis
 - g. Lack of peritoneal dialysis infrastructure, dedicated resources, and support
 - h. Lack of patient education on peritoneal dialysis
 - i. Other patient-related barriers
 - j. Concern about peritoneal dialysis clinical outcomes, relative to hemodialysis outcomes
 - k. Concern about mortality rates with peritoneal dialysis
 - l. No barrier
 - m. Proliferation of hemodialysis centers
19. Which of the following textbooks on peritoneal dialysis are available to the residents
- a. Nolph and Gokal's Textbook of Peritoneal Dialysis
 - b. Peritoneal Dialysis–Primer
 - c. Others
20. Which of the following journals dedicated to peritoneal dialysis are available to residents/postgraduates?
- a. Peritoneal Dialysis International
 - b. Indian Journal of Peritoneal Dialysis
 - c. Advances in Peritoneal Dialysis
21. In your peritoneal dialysis program, are the following regularly performed to peritoneal dialysis patients?
- a. Peritoneal Equilibration Test
 - b. Kt/V for peritoneal dialysis patients
 - c. Calculation of peritonitis rates
 - d. Training in hand hygiene to the residents/faculty
 - e. Percutaneous placement of peritoneal dialysis catheter
 - f. Exit site care
22. How many residents/postgraduates attend conferences/CMEs on peritoneal dialysis per year?
23. How many residents/postgraduates have published an article on peritoneal dialysis in the last 1 year?
24. What are the topics covered as a part of residents/postgraduates curriculum in classroom setting
- HD (yes/No) PD (yes/No)
- a. Physiology
 - b. Modality selection
 - c. Prescription management
 - d. Infection management
 - e. Access management
 - f. Other complications
 - g. Nutrition management
 - h. Administrative issues
 - i. Others

Thank you