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Regional discrepancies in peritoneal dialysis utilization in France: the role of the nephrologist's opinion about peritoneal dialysis

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Abstract

Background. Peritoneal dialysis (PD) is underused in France compared with other countries. In addition, there are tremendous regional discrepancies concerning the utilization rate of PD. This study was carried out to evaluate the opinion of French nephrologists regarding the optimal rate of PD utilization and to determine which factors limit PD development in France.

Methods. Of the 22 French regions, 2 regions with a high rate of PD utilization (prevalence >15%) and 3 regions with a low rate of PD utilization (prevalence <10%) were selected. In June 2007, nephrologists from the five regions were surveyed by questionnaire. Responses were compared between 'low-prevalence' and 'high-prevalence' groups.

Results. The response rate was 70% and there was no significant difference between the two groups regarding the response rate. In the two groups, a majority of nephrologists were in charge of PD patients (30/34 in 'high-prevalence' group versus 61/80 in 'low-prevalence' group, $P = 0.14$). Information about PD in the predialysis clinics was provided by nephrologists from high- and low-prevalence regions (32/34 versus 65/80, $P = 0.08$). Opinions on the optimal rate of PD for prevalent and incident dialysis patients were significantly different between 'high-prevalence' and 'low-prevalence' groups [31 ± 15% versus 25 ± 14% ($P < 0.03$) and 25 ± 14% versus 19 ± 9% ($P < 0.02$)].

There was a significant difference concerning the optimal rate of PD in incident dialysis patients between nephrologists working in public centres (29 ± 15%), those working in non- profit clinics (27 ± 12%) and nephrologists working in the private sector (14 ± 8%).

Lack of nurses available for the patient care (48%), low reimbursement of PD (25%), limited training (23%) and hospital care facilities (23%) were the main barriers limiting PD utilization.

Conclusions. In France, like in other countries, there are factors limiting PD development; however, regional discrepancies regarding PD utilization seem to be linked to the nephrologist's opinion.

Keywords: France; peritoneal dialysis; survey

Introduction

Peritoneal dialysis (PD) is underused in France compared with other countries [1]. In 2003, 8.9% of prevalent dialysis patients were treated by PD [2,3]. However, there are important discrepancies regarding the rate of PD utilization between the different French regions. In 2003, the rate of PD utilization in prevalent dialysis patients varied from 2.9% to 26.5% [3]. On multivariate analysis, after adjustment for patient comorbidities, French regions were strongly associated with PD utilization. At the same time, in regions where the rate of PD utilization was low, there was a high proportion of dialysis patients treated in satellite dialysis units. This finding shows that French nephrologists are not reluctant to promote self-care dialysis.

In countries like Canada, where the rate of prevalent PD patients is among the highest in developed countries, PD utilization is declining [4]. The inability of a patient to perform PD exchanges has been reported as a frequent contraindication to PD [5]. Therefore, the growing number of elderly patients starting renal replacement therapy may contribute to the decline of PD [6]. However, assisted PD is fully covered by the French health care insurance, so that the low rate of PD utilization in France [7–9] cannot be explained by the increasing proportion of elderly patients on dialysis.

It has been shown that non-medical factors are involved in the underutilization of PD [10,11]. In addition, the nephrologist's preferences may influence dialysis modality selection. On the other hand, surveys about the nephrologist's opinions on dialysis modality selection do not reflect the real rate of PD utilization [12–16].

The main objective of this study was to evaluate the opinions of French nephrologists regarding PD. This study

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Table 1. Distribution of nephrologists concerning ownership patterns of dialysis according to prevalence groups

Group	Public centres	Non-profit clinics	Private sector
High prevalence	35	7	9
Low prevalence	76	16	19
Total	111	23	28

was also carried out to determine whether nephrologists' opinions reflect the rate of PD utilization in the different French regions and to identify barriers to the development of PD in France.

Subjects and methods

Five regions were selected among the 22 French regions (Basse Nornandie, Pays de Loire, Centre, Haute Normandie and Lorraine). French territories were excluded from the study. In an attempt to compare nephrologists' opinions between high-PD prevalence and low-PD prevalence regions, the selection was based on the rate of PD utilization among prevalent dialysis patients in 2003 [3]. High-prevalence regions were defined by a rate of PD >15% and low-prevalence regions were defined by a rate of PD utilization <10%. Assuming that the response rate would be lower in low-prevalence regions, we selected 3 regions among the 11 regions with a prevalence rate <10%: Pays de Loire (6%), Centre (5.9%) and Haute Normandie (10%), whereas only 2 high prevalence regions were surveyed among the 4 regions with a prevalence rate >15%: Basse Normandie (21%) and Lorraine (15%) [2]. These regions were arbitrarily chosen by the survey coordinator. Nephrologists were divided into two groups based on the prevalence rate of the region where they were working ('low-prevalence' group and 'high-prevalence' group). The survey committee included one nephrologist involved in the field of PD from each participating region. There was no difference between the two groups concerning ownership patterns of dialysis (public centre, non-profit clinic, private sector) (Table 1).

An anonymous questionnaire was designed by the survey committee (Appendix). This questionnaire was adapted, with permission, from the questionnaire used by Finkelstein *et al*. in a recently published survey [12]. Nephrologists from the five different regions received information about the survey in a letter sent by the committee 1 month before the questionnaire was mailed. The questionnaire was mailed to all senior nephrologists (162 physicians) of the selected regions in June 2007 according to the Fresenius™ Medical Care France database, with permission, because although the French Medical Council's database (Conseil National de l'Ordre des Médecins) included 197 physicians in these five regions (1158 in France), some of them did not care for chronic dialysis patients, such as intensive care physicians or researchers, whereas the Fresenius™ Medical Care France database included all nephrologists who care for chronic dialysis patients and was more relevant in our opinion. A second mail was sent in September 2007 to increase the response rate. Responses were collected by the study coordinator and tracked in an Excel sheet.

Table 2. Response rate according to regions

		Response rate	
Group	Region	*n*	%
High prevalence	Basse Normandie	13/21	62
	Lorraine	21/30	70
Low prevalence	Pays de Loire	33/37	89
	Centre	18/39	51
	Haute Normandie	29/35	83
	Total	114/162	70

Continuous variables are expressed as mean ± standard deviation. Categorical variables are expressed as proportion. The univariate analysis was performed with the Fischer exact test for categorical variables and the Mann–Whitney test for continuous variables. The statistical difference was considered to be significant for $P < 0.05$. Data were stored and analysed with Excel software.

Results

Response rate

A total of 162 questionnaires were sent to all nephrologists from the five different regions; 114 (70%) were returned after the second mailing (34 from the 'high-prevalence' group and 80 from the 'low-prevalence' group). There was no significant difference between the 'high-prevalence' group and the 'low-prevalence' group regarding the response rate (34/51 versus 80/111). Furthermore, each ownership pattern of dialysis was represented in the same way in each group. Nevertheless, the response rate varied significantly between the five different regions (Table 2). Of the 114 responding nephrologists, 80 worked in the public system, 19 in non-profit clinics and 15 in the private sector.

Opinion about the rate of PD

Among the 114 responding nephrologists, 91 were in charge of PD patients. The proportion of nephrologists involved in PD patients care was similar between 'high-prevalence' and 'low-prevalence' groups (30/34 versus 61/80, $P = 0.14$). Of the 114 nephrologists, 97 reported that they provided both PD and haemodialysis information to their patients before starting renal replacement therapy. The rate of nephrologists who informed their patients about the two dialysis modalities did not differ significantly between the 'high-prevalence' and the 'low-prevalence' group (32/34 versus 65/80, $P = 0.08$).

Nephrologists were asked to give their opinion on the optimal rate of PD for prevalent and incident dialysis patients. Nephrologists felt that 27 ± 15% of incident dialysis patients and 20 ± 11% of prevalent end-stage renal disease patients should be treated by PD. There was a significant difference between the 'high-prevalence' and the 'low-prevalence' group regarding the ideal PD rate for incident and prevalent dialysis patients (31 ± 15% versus 25 ± 14%, $P = 0.03$ and 25 ± 14% versus 19 ± 9%, $P = 0.02$, respectively). The data showed important

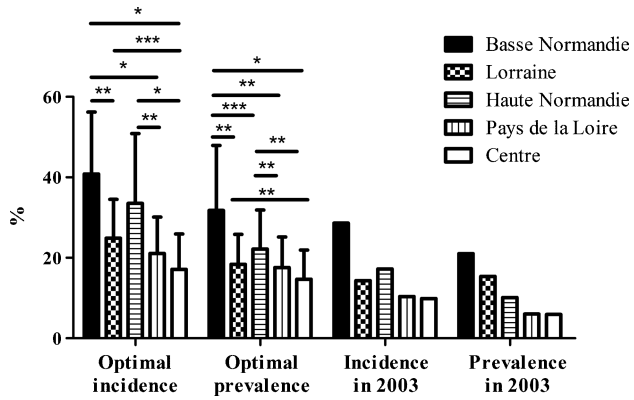

Fig. 1. Opinion about the optimal proportion of peritoneal dialysis utilization in incident and prevalent end-stage renal disease patients according to each region ($^{*}P < 0.001$, $^{**}P < 0.01$, $^{***}P < 0.05$).

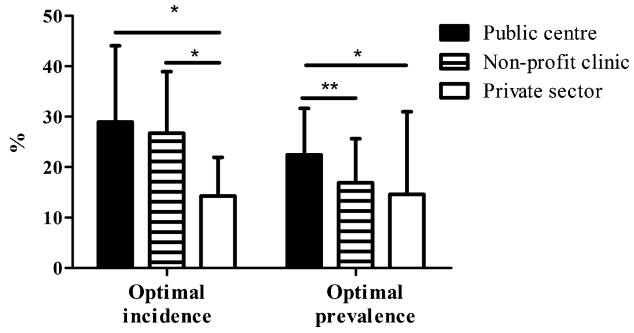

Fig. 2. Opinion about the optimal proportion of peritoneal dialysis utilization in incident and prevalent end-stage renal disease patients according to nephrologists' activity ($^{*}P < 0.005$, $^{**}P < 0.02$).

differences between the different participating regions (Figure 1). In addition, the opinion about the ideal percentage of PD utilization in incident and prevalent dialysis patients differed significantly between nephrologists working in the public system, in non-profit clinics and in the private sector (Figure 2). Indeed, nephrologists working in public centres felt that 29 ± 15% of incident dialysis patients and 22 ± 9% of prevalent dialysis patients should be treated by PD, whereas for nephrologists from the private sector, only 14 ± 8% of incident dialysis patients and 15 ± 16% of prevalent dialysis patients should be maintained on PD. Moreover, nephrologists working in non-profit clinics felt that 27 ± 12% of incident dialysis patients and 17 ± 9% of prevalent dialysis patients should be treated by PD.

Barriers to utilization of PD

Nephrologists were asked to give their opinion about factors limiting PD utilization (Table 3). The main factor was the lack of nurses available for patient care (48%). Other concerns were low reimbursement of PD (25%), limited training on PD (23%), hospital care facilities for the patient's transfer to haemodialysis (23%) and limited experience on PD (18%). Specific problems associated with PD were not the major reason limiting PD utilization. Patient survival on PD was a matter of concern for only 3% of the nephrologists. Technique failure and peritonitis rate were factors

Table 3. Concerns about factors limiting PD development according to regions

	'High prevalence' group		'Low prevalence' group	
Concern	*n*	%	*n*	%
Lack of nursing care	12	35.3	43	53.8
Low reimbursement	6	17.6	22	27.5
Limited training	5	14.7	21	26.3
Hospital care facility barriers	7	20.6	19	23.8
Limited experience	4	11.8	17	21.3
Catheter-related problems	4	11.8	17	21.3
Long-term viability	4	11.8	11	13.8
Peritonitis rate	2	5.9	7	8.8
Mortality rates of PD patients	2	5.9	2	2.5
Other concerns	8	23.5	35	43.75[a]

[a] $P < 0.05$ versus 'high-prevalence' group.

Table 4. Concerns limiting PD development according to nephrologists' activity

	Public centres		Non-profit clinics		Private sector	
Concern	*n*	%	*n*	%		
Lack of nursing care	41	51.3	7	38.9	7	43.8
Low reimbursement	13	16.3	6	33.3	9	56.3[b]
Hospital care facility barriers	13	16.3	7	38.9[a]	6	37.5
Limited training	20	25.0	3	16.7	3	18.8
Limited experience	19	23.8	1	5.6	1	6.3
Catheter-related problems	14	17.5	3	16.7	4	25.0
Long-term viability	7	8.8	2	11.1	6	37.5[b]
Peritonitis rate	6	7.5	0	0.0	3	18.8
Mortality rates of PD patients	1	1.3	0	0.0	3	18.8[b]
Other concerns	28	35.0	10	55.6	5	31.3

[a] $P < 0.05$ versus public centres; [b] $P < 0.01$ versus public centres.

that limited the use of PD for 13% and 8% of the surveyed nephrologists. Furthermore, catheter-related problems were considered as a limiting factor for 18% of the nephrologists. As shown in Table 3, there was no significant difference between high-prevalence regions and low-prevalence regions regarding the nephrologist's opinion about factors limiting PD utilization.

For nephrologists working in the private sector, low reimbursement of PD and facility issues were considered as barriers to utilization of PD (56% and 37% respectively). As shown in Table 4, nephrologists' opinions differed significantly between nephrologists working in public centres and those working in the private sector.

Discussion

There is absolutely no doubt in 2008 that PD is a suitable method to treat end-stage renal disease patients [17,18]. PD may preserve residual renal function in non-anuric patients [19,20]. In addition, PD protects the vascular network, which is a matter of concern in view of the duration of the renal replacement therapy. It has been established that the

different dialysis modalities should be considered with an integrative approach [21].

It is well known that non-medical factors are involved in the underutilization of PD [10]. Health care system funding is associated with the rate of PD utilization [11]. Even though financial issues are not the primary consideration used in choosing dialysis modality, in general, in countries where physician payment for PD is low, the rate of PD utilization is low. Thus, low reimbursement of PD and low physician payment are partially responsible for the underutilization of PD in the private sector in France. Our survey shows that optimal PD utilization for nephrologists working in the private sector is lower than the optimal rate for nephrologists working in the public sector.

One recent study from France showed that PD is cheaper than haemodialysis, even with the additional cost due to patient assistance [22]. There are a lot of regional discrepancies regarding the rate of PD penetration in France [2]. Interestingly, our survey shows nephrologists' opinions towards PD partially reflect the rate of PD utilization. Indeed, there was no significant difference between high-prevalence regions and low-prevalence regions regarding nephrologists' opinions about barriers that affect PD utilization. This finding emphasized the fact that physician willingness has a major impact on PD utilization. Therefore, the nephrologist's opinion about optimal incidence and prevalence surely affects current rates.

Due to technique survival, it is assumed that the rate of PD utilization in incident dialysis patients must be greater than the rate of PD in prevalent dialysis patients. It has been shown in a Markov model that 45% of incident dialysis patients had to be treated by PD in order to reach a proportion of 16% of PD in prevalent dialysis patients at 5 years [23,24]. This projection was calculated with an initial rate of PD of 7% in prevalent dialysis patients. Our survey clearly shows that this critical issue is not taken into account by French nephrologists.

Mendelssohn *et al*. did a survey about the opinions of American nephrologists regarding dialysis modality selection and noted that American nephrologists felt that PD therapy was underused in the United States [16]. In addition, medical directors of the dialysis centres in New England felt that 29% of prevalent dialysis patients should be treated by PD [12]. In Canada, nephrologists expressed that, in order to maximize survival, wellness and quality of life, 37% of prevalent end-stage renal disease patients should be treated by PD [14]. Interestingly, in the United Kingdom one survey showed that British nephrologists thought that 38% of dialysis patients should be treated by PD in an ideal dialysis system to maximize survival, quality of life and wellness [13]. Our study shows that nephrologists who were surveyed in the five French regions felt that 20% of end-stage renal disease patients should be maintained on PD. There is no clear reason that can explain why the ideal proportion of prevalent PD patients expressed by nephrologists is lower in France compared with other countries. At the same time, it is obvious that PD was considered to be underused by the nephrologists surveyed in our study.

Assisted PD is fully reimbursed by the French health care insurance; as a consequence, PD is often used in elderly patients or in patients with many comorbid conditions as an alternative to in-centre HD [9]. Public hospitals are not supposed to treat self-care HD patients and PD patients in France, so that those patients have to be transferred to non-profit centres. Non-profit centres have no beds to hospitalize PD patients; consequently, PD patients must be hospitalized in public hospitals, which may provoke a problem of nursing organization in the nephrology unit. This could explain the fact that nephrologists felt that a lack of nurses available for the patient's care is a frequent limitation for PD utilization.

In our survey, French nephrologists felt that the lack of experience and training on PD is a barrier to PD utilization. In France, there is no core curriculum for PD in academic hospitals. Furthermore, with the exception of some centres, PD is not performed in teaching hospitals. Thus, it is likely that, as in the United States, the number of PD patients available for training fellows in teaching hospital is too small to allow training in PD [25].

In conclusion, this survey shows that the opinions of nephrologists regarding barriers that affect PD development are similar between nephrologists working in low-prevalence regions and those working in high-prevalence regions. The optimal rate of PD utilization is lower in low-prevalence regions compared with high-prevalence regions. This finding emphasizes the fact that the nephrologist's opinion on dialysis modality has a major impact on the rate of PD utilization.

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Conflict of interest statement. None declared.

Appendix

Questionnaire (adapted with permission from [12])

1. What is your practice region?
2. What is your main activity? ☐ Public ☐ Non-profit clinic ☐ Private
3. Do you care for PD patients? ☐ Yes ☐ No
4. Do you provide information to your patient about HD and PD? ☐ Yes ☐ No
5. In your opinion what percentage of patients entering in dialysis should be started on PD? . . . . . .
6. In your opinion what percentage of prevalent dialysis patients should be maintained on PD? . . . . . .
7. What are the reasons that limit PD utilization in your practice?

   ☐ Limited training in PD
   ☐ Poor personal experience with PD
   ☐ Lack of nursing expertise to support PD programme
   ☐ Lower physician reimbursement for PD
   ☐ PD catheter-related problems
   ☐ Concerns about peritonitis rates
   ☐ Concerns about long-term viability of PD
   ☐ Concerns about relative mortality rates with PD
   ☐ Problems with hospital support for PD

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