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Bulletin de la Dialyse à Domicile

Transition between peritoneal dialysis and home hemodialysis in Belgium and France in the French Language Peritoneal Dialysis Registry (RDPLF)

Transition entre dialyse péritonéale et hémodialyse à domicile en Belgique et France dans le RDPLF

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Résumé

L'hémodialyse à domicile connait ces dernières années un regain d'intérêt, favorisé par la disponibilité de nouvelles machines et les travaux sur l'hémodialyse quotidienne. Depuis 2013 le RDPLF est devenu un registre de dialyse à domicile qui enregistre les données des patients traités par dialyse péritonéale et de ceux traités en hémodialyse à domicile toutes techniques confondues. Neuf centres belges et cinquante sept centres français communiquent les informations concernant leurs patients traités par hémodialyse à domicile. Dans les centres du RDPLF 56 % des patients belges en hémodialyse à domicile sont traités en hémodialyse quotidienne, en France 83 % des patients de domicile sont en dialyse quotidienne. Le chiffre français n'est pas représentatif de la totalité du pays mais s'explique par le biais de recrutement. Dans les deux pays, 13 % des patients en hémodialyse à domicile ont été antérieurement traités par dialyse péritonéale avec une période intermédiaire d'hémodialyse en centre ou de transplantation. La durée médiane d'hémodialyse en centre est de 10 mois avec des extrêmes variant de 2 mois à 25 ans. Les patients de DP traités secondairement en hémodialyse à domicile sont principalement des patients jeunes, non diabétiques et autonomes. Une information précoce chez les patients qui ont un risque d'échec de dialyse péritonéale, et la mise à disposition de matériels permettant les deux techniques permettraient de réduire ou abolir un passage transitoire en hémodialyse en centre et assureraient le maintien à domicile chez les patients qui le souhaitent.

Mots clés : hémodialyse à domicile, hémodialyse quotidienne, dialyse à domicile, dialyse péritonéale, transition

Summary

A renewed interest in home hemodialysis (HHD) has emerged in recent years, brought about by the availability of new dialysis machines and encouraging research about daily hemodialysis (HD). Since 2013, the RDPLF, a home dialysis registry, has recorded the data of patients treated with peritoneal dialysis (PD) and those treated with HHD, regardless of technique. Through this organization, nine Belgian centers and fifty-seven French centers communicate information about their patients treated by hemodialysis at home. According to RDPLF, 56% of Belgian HHD patients are treated with daily hemodialysis, while in France 83% of home patients are on daily dialysis. This large number in France, however, is not representative of the whole country but can be explained through the recruitment of new centers already involved in PD and convinced by the interest in continuous daily treatment. In both countries, 13% of HHD patients were previously treated with PD, with an interim period of in-center HD or transplantation. The median duration of in-center HD is 10 months, with extremes ranging from 2 months to 25 years. PD patients treated secondarily through HHD are mainly young, non-diabetic, and independent patients. Early information about patients who have a risk of PD failure and the provision of materials supporting both techniques would reduce or abolish a transient transfer to in-center HD and ensure home care in patients who desire it.

Key words : home hemodialysis, daily hemodialysis, peritoneal dialyis, transition

Abbreviation :
REIN : Réseau Epidémiologique et Information en Néphrologie (Epidemiological and Information Network in Nephrology)
RDPLF : Regsitre de Dialyse Péritoneale de Langue Française (French Language Peritoneal Dialysis Registry)
ISPD : International Society for Peritoneal Dialysis
HHD : Home Hemodiakysis

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INTRODUCTION

While the first dialysis patients were treated with HHD in the early 1970s with a prevalence that sometimes reached 20% [1–2], this prevalence declined rapidly in the early 1980s for multiple reasons: the effect of dialysis on the spouse [3], the need for a training period of several weeks, the development of self-dialysis centers, and the need for the spouse or partner to be present. In France, the possibility of having assisted PD administered by a private nurse [4] for non-autonomous PD patients has resulted in the latter being, practically speaking, the only available home dialysis method. The recent appearance of new HHD machines and the development of daily HD have rekindled the interest in and desire for a growing number of teams to develop an HHD technique. In addition, the presence of the patient's spouse no longer appears essential in Belgium [5] and is requested in France only by certain organizations. Finally, the development of the buttonhole technique for the puncture of the arteriovenous fistula (AVF) and the possibility, still distant in Belgium, for certain patients to have HHD with a central catheter has favored the development of HHD during the last 10 years. Since 2012, the RDPLF has not only continued to follow not only patients on PD but also the fate of all patients on all forms of home dialysis.

The sequential use of PD and HHD may help keep patients at home using their technique of choice. The aim of this study is to assess the numbers and profiles of patients who are transferred from PD to HHD.

PATIENTS ET METHODS

SELECTION

The patients were selected from Belgian and French centers registering HHD patients in the RDPLF database from January 2010 to July 2020.

The RDPLF database comprises two separate databases: one dedicated to patients treated with PD and the other to patients treated with HHD. When an HHD patient has been treated with PD and recorded in the database during this period, there is a link between the two modules that allows the patient's history with each technique to be reconstructed. On the other hand, if there is a transitional period of HD in a center or on transplantation, this period is not followed by the RDPLF, which is devoted only to home dialysis.

The HHD entry form includes an item indicating whether the patient has been treated with PD and recorded under this treatment in the RDPLF. It is, therefore, possible to individualize the PD centers with patients who had used both methods. We have secondarily studied the characteristics of the patients treated in these centers.

RESULTS

Number of centers:

BELGIUM: 9
FRANCE: 57

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Table I. Patients included and treatment modalities

Country	Total number of HHD patients in RDPLF	Patients with history of PD treatment	1–4 HD sessions per week	5–6 HD sessions per week	7 HD sessions per week
Belgium	225	32 (13.3%)	14 (44%)	18 (56%)	0
France	486	64 (13.5%)	8 (12%)	53 (83%)	3 (%)

STATISTICS

The analyzes were carried out using R software, version 4.0.2.
Comparisons of patient profiles transferred or not transferred to HDD were made for both continuous and categorical variables.

ETHICS AND QUALITY CONTROL

The RDPLF database is declared to the Commission Nationale de l'Informatique et des Libertés (CNIL) under the approval number 542668. The centers undertake that each patient included in the database receive a form consent and can request access and/or deletion of their data. The data entered is subjected to a plausibility algorithm and visual inspection by a trained secretary and two dedicated nurses; a check-up by a nephrologist is carried out in case of difficulty and, if doubt persists, the centers are contacted.

Prescribing HHD for patients previously treated with PD

Of the 32 total patients in Belgium, 17 (53%) were on a low-dialysate-flow rate machine compared to 52 of 64 (81%) in France.

Transplant history

Nine patients came directly from transplantation.

Of the former PD patients, 42 were transferred to HHD after a previous period of in-center HD, but, among these, 13 left PD for transplantation and therefore were selected for HHD instead of PD after transplant failure without knowing whether this was a choice made by the nephrologist or the patient.

The time patients returning from kidney transplant spent in PD before transplantation did not differ significantly between patients who secondarily stayed on in-center HD (18.9 months ± 16) and those who transferred to HHD (18.9 ± 16).

In-center HD vintage in PD patients who were administered in-center HD before being treated at home

Forty-six patients were released from PD for transfer to HD; the median time between the date of transfer of PD to HD in a center and that of starting HHD was 10 months; the mean duration was not retained due to extreme differences over a period of up to 25 years in two patients, one of whom had received a transplant once on HD and the other of whom had a long period of HD in the center.

Number of PD centers with patients transferred from PD to HHD

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Secondary selection: Of the 57 centers participating in the HHD module, 38 had patients with a history of PD before HHD (Group A centers). In the remaining centers, no PD patients were known to have been treated with HHD. In other words, none of their HHD patients was known to have been treated with PD in the past (Group B centers).

We selected all patients from the Group A centers and within these compared the profiles of the patients transferred to HD according to whether they had been secondarily transferred to HDD. Their characteristics are summarized in Table II.

Table II shows the profile of patients who maintained HD in France after transferring from PD treatment versus patients who received secondary HHD. Only centers that had had some patients transferred from PD to HHD were selected.

Table II. Patients profiles of PD patients maintained on hemodialyisis in center or at home

Variable	Maintained on in-center hemodialysis N = 1350	Secondary transferred to home hemodialysis N=41	p-value
Sex			>0.999
Female	510	15	
Mae	840	26	
Diabetes			**0.007**
Yes	465 (34.44%)	6 (14.63%)	
No	885 (65.56%)	35 (85.37%)	
Cause of peritoneal dialysis transfer to hemodialysis			0.600
Miscellaneous	366	9	
Peritonitis	246	8	
Psycho-social	85	2	
Catheter infection or dysfunction	138	2	
Under dialysis or loss of ultra-filtration	368	16	
Insufficient ultrafiltration	136	4	
Autonomy			**<0.001**
Assisted patients	558 (41.33%)	5 (12.20%)	
Autonomous patients	792 (58.67%)	36 (87.80%)	
Peritoneal dialysis vintage			0.791
Number	1287	40	Wilcoxon rank-sum
Mean (SD)	22.89 (23.32)	23.82 (22.93)	
Median (IQR)	16.00 (24.00)	16.50 (21.25)	
Missing	63	1	
Age			**<0.001**
Count	1350	41	Wilcoxon rank-sum
Mean (SD)	61.87 (17.12)	45.85 (15.70)	
Charlson			**<0.001**
Mean (SD)	5.70 (2.52)	4.07 (2.07)	
Missing	3	0	
Modified Charlson			0.084
Count	1346	41	Wilcoxon rank-sum
Mean (SD)	3.81 (1.85)	3.37 (1.71)	
Missing	4	0	

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DISCUSSION

The general description of the 57 HD centers in the RDPLF shows a marked difference between Belgium and France in each's use of low-flow dialysate machines and daily HD: while 44% of Belgian patients are dialyzed 5 times or more per week, almost all French patients (83%) are using low-dialysate-flow machines. In the French REIN registry (Couchoud, personal communication), however, the percentage of HHD patients treated by daily dialysis was around 50%, identical to the percentage in Belgium. This can be explained by the recruitment bias of the RDPLF: while REIN is exhaustive in hemodialysis, the RDPLF only has about half of its centers and patients on HDD, and those that do are usually centers that have started HHD more recently and even then only in daily HD, whereas the old centers have had a long practice of conventional HHD.

The aim of this work was not to propose a predictive factor for transfer from PD to HHD, an approach recently taken by Nadeau-Fredette et al. [6]. In their study, 5% of PD patients were transferred to HDD within 180 days of the cessation of PD, the time between PD and HDD being spent on in-center HD. The predictors of PD–HDD transfer were young age, male sex, obesity, and duration of PD. While the RDPLF is relatively exhaustive for patients treated with PD in France, only around 40% of patients on HHD in France are included. In addition, the data are exhaustive for the French-speaking part of Belgium, but only a few Dutch-speaking centers participate in the RDPLF. This makes it impossible to analyze all the PD-to-HDD transitions throughout the entire population of Belgian and French dialysis patients.

We selected in the RDPLF database the PD centers that had at least some patients who had been successively treated on PD and HHD. The aim was to assess the PD-to-HD transition policy within teams that obviously offered both treatment methods to their patients. Thus, of the 66 teams that communicate HHD data to the RDPLF, only 38 had patients who had used both techniques at their centers. This does not mean that the remaining teams do not offer both methods, simply that they did not have this scenario. Restricting the analysis to 38 centers that had transferred from one method to another allowed us to be certain that the two techniques were freely available there.

Table II summarizes the characteristics of the patients in these centers depending on whether, after transfer to HD in a center, they were subsequently transferred to HHD. The only elements that seem to favor this transfer are younger age (45.8 ± 15 years in those transferred to HDD versus 61.8 ± 17 in those who remained on in-center HD), the absence of diabetes, and those who had been autonomous in their PD. Paradoxically, in this series there is no difference in sex, whereas, across the whole HHD population, HDD patients are more often men than women; this does not seem to work in the case of those who transfer from PD to HDD. The overall Charlson index differs significantly between the two groups, but age has an important weight in this index; if the modified Charlson index which does not take age into account is used, there is no difference. A multicenter study [7] has reported that peritonitis was the main cause of emergency transfer to HD in a center, whereas inadequate dialysis was the main cause of planned transfers to dialysis. Regarding the present study, which relates only to patients transferred to HHD, we saw no difference in the proportions of the cause of PD failure dropout in patients remaining on in-center HD versus those secondarily treated with HHD.

A recent general review [8] in Canada underlined that the choice of the next treatment in the event

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of the failure or end of efficacy of PD should be based more on the needs and life choices of the patients themselves than on strict medical criteria that have so far not been proven justified. This is in line with the latest ISPD guidelines that recommend a prescription based on the patient's goals [9], which were recently translated in this review [10].

HHD patients who were transferred after PD treatment without an intermediate transplant period had a highly variable period of in-center HD, with a median duration of 10 months in this series. We do not have in the RDPLF information on the period of in-center HD of these patients, and a study with the French REIN registry could probably better analyze the reasons for a period of prolonged in-center HD; this would then enable researchers to study the survival of patients transferred to in-center HD after PD.

A recent study published in the United States using the USRDS registry demonstrated, after adjusting for associated factors, that patients transferred to HHD after stopping PD had better survival than those who remained on in-center HD after transfer [11].

The results presented above show that a majority of patients treated with HHD with a history of treatment with PD are patients who had been transplanted, either as a cause of discontinuing PD or following a transfer to HD. This does not seem to be related to a longer transplant waiting period, which raises fears of a decrease in the function of the peritoneal membrane. On the other hand, it has been demonstrated in the RDPLF that patients treated with PD after transplant failure have lower technical survival [12]; the French High Health Authority (HAS) considers there to be an increased risk of peritonitis with this sequence, but finds that the PD associated with the maintenance of the immunosuppressive treatment can facilitate the presence of preserved diuresis. There is strong agreement that, after transplant failure, as well as HHD AS PD can be used [13].

The main weakness of our study is its lack of exhaustivity of the population of HHD patients registered in the RDPLF, which represents less than 50% of the patients on HHD in France. The inclusion of HHD patients in the RDPLF is recent: less than 10 years old. Its main advantage is its comparison of two groups of centers that offer both techniques to their patients.

A significant proportion (13% in both Belgium and France) of patients treated with HHD after a history of treatment with PD underlines the possibility of complementarity between the two techniques. Patients who initially made the choice of HHD are generally resistant to being transferred to in-center HD, and this can lead to a delay in transfer, with greater co-morbidities. The risk of mortality after transfer to in-center HD is higher in the initial period following transfer [14]. HHD should be offered very early to PD patients in whom a risk of a deterioration of the criteria of adequate dialysis, an increased risk of peritonitis, or an unresolved psychosocial problem is detected. Given the perspective on staying at home, the transfer from PD to HD would not be seen as a failure by either the patient or the team in charge of his or her treatment, and a planned early transition between dialysis methods would reduce the risk of complications after the transfer.

The design of out-of-hospital dialysis units where both techniques are offered should be favored; otherwise, one problem in the management of transfers is the fear for patients of changing care teams when they must transfer from PD to HHD.

It is then necessary to plan sufficiently early for the realization of a vascular approach. Ideally,

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HHD machines should offer the possibility of automated PD. This is all the more justified since young patients are generally those who are already being treated with PD on a machine. If this machine could provide both treatments, the transition from PD to HHD could happen without transfer to in-center HD or at least with a shorter duration. It would then be logical to consider in transplantable patients an initial treatment sequence of PD, then transplantation. Then, in the event of the failure of the latter, the possibility of HHD if the vascular accesses were initially preserved could be facilitated.

CONCLUSION

The PD patients treated secondarily with HHD are mainly young, non-diabetic, and independent patients. Early information in patients who are at risk of PD failure and the availability of machines allowing both techniques would make it possible to reduce or abolish a transient transition to HD in a center and would ensure home care in patients who desire it. A significant number of patients who have stopped PD for transplantation have chosen, in the event of graft loss, HHD rather than PD again; this underlines the importance of preserving their vascular access during their initial treatment with dialysis.

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DISCLOSURE

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REFERENCES

1 - Philippe Brunet. Bull. La dialyse au domicile des patients : l'autonomie des patients vis à vis d'un organe artificiel est-elle possible ? Acad. Natle Méd., 2018, 202, nos 3-4, 549-558, séance du 6 mars 2018. http://www.academie-medecine.fr/wp-content/uploads/2018/03/18.3.6-BRUNET-site.pdf [consulté Aout 2020]
2 - Meyrier A. Naissance, croissance, décadence et renaissance de l'hémodialyse à domicile. Bull Dial Domic [Internet]. 23déc.2018 [cité 30août2020];1(3):99-103. Disponible sur: https://doi.org/10.25796/bdd.v1i3.56
3 - Marjorie Roques, Nadine Proia-Lelouey. La dialyse à domicile : quelles motivations et quels retentissements sur le couple ? Dialogue 2015/4 (210), 110-122
https://www.cairn.info/revue-dialogue-2015-4-page-111.htm [consulté Aout 2020]
4 - Pierre-Yves Durand, Christian Verger. The State of Peritoneal Dialysis in France. Perit Dial Int. 2006;26: 654-657. https://doi.org/10.1177/089686080602600608
5 - Cécile Couchoud, Emilie Savoye, Luc Frimat, Jean-Philippe Ryckelynck, Ylana Chalem, Christian Verger, Working Group. Peritoneal Dialysis» of the French REIN Registry. Variability in case mix and peritoneal dialysis selection in fifty-nine French districts. Perit Dial Int. Sep-Oct 2008;28(5):509-17.
6 - Annie-Claire Nadeau-Fredette, Carmel Hawley, Elaine Pascoe, Christopher T Chan, Martine Leblanc, Philip A Clayton, Kevan R Polkinghorne, Neil Boudville, David W Johnson. Predictors of Transfer to Home Hemodialysis after Peritoneal Dialysis Completion. Perit Dial Int. 2016 Sep-Oct; 36(5): 547–554
https://dx.doi.org/10.3747%2Fpdi.2015.00121
8 - Lucie Boissinot, Isabelle Landru, Eric Cardineau, Elie Zagdoun, Jean-Philippe Ryckelycnk and Thierry Lobbedez
Is Transition Between Peritoneal Dialysis and Hemodialysis Really a Gradual Process?
Perit Dial Int July-August 2013 vol. 33 no. 4 391-397
https://doi.org/10.3747/pdi.2011.00134
8 - Sheru K. Kansal, Jose A. Morfin, Eric D. Weinhandl. Survival and Kidney Transplant Incidence on Home versus In-Center Hemodialysis, following Peritoneal Dialysis Technique Failure
Peritoneal Dialysis International, 2019 Vol. 39, pp. 25–34

https://doi.org/10.3747/pdi.2017.00207
9- Edwina A Brown, Peter G Blake, Neil Boudville, Simon Davies, Javier de Arteaga, Jie Dong, Fred Finkelstein, Marjorie Foo, Helen Hurst, David W Johnson, Mark Johnson, Adrian Liew,Thyago Moraes, Jeff Perl, Rukshana ,Shroff, Isaac Teitelbaum, Angela Yee-Moon Wang and Bradley Warady. International Society for Peritoneal Dialysis practice recommendations: Prescribing high-quality goal-directed peritoneal dialysis. Peritoneal Dialysis International2020, Vol. 40(3) 244–253
https://journals.sagepub.com/doi/pdf/10.1177/0896860819895364
10- Max Dratwa, Christian Verger. Traduction des Recommandations de pratique de la Société internationale de dialyse péritonéale: prescrire une dialyse péritonéale de haute qualité dirigée par un objectif . Bull Dial Domic [Internet]. 9avr.2020 [cité 2sept.2020];3(1):5-18. Disponible sur: : https://doi.org/10.25796/bdd.v3i1.54453
11 - Benoit Imbeault1 and Annie-Claire Nadeau-Fredette. Optimization of Dialysis Modality Transitions for Improved Patient Care.Can J Kidney Health Dis. 2019;6:1–10
https://dx.doi.org/10.1177%2F2054358119882664
12- Myriam Benomar, Clement Vachey, Thierry Lobbedez, Julie Henriques, Didier Ducloux, Dewi Vernerey, Cécile Courivaud
Peritoneal dialysis after kidney transplant failure: a nationwide matched cohort study from the French Language Peritoneal Dialysis Registry (RDPLF)
Nephrology Dialysis Transplantation, Volume 34, Issue 5, May 2019, Pages 858–863, https://doi.org/10.1093/ndt/gfy290
13 - Indications et non-indications de la dialyse péritonéale chronique chez l'adulte
Consensus formalisé. Juin 2007.
https://www.has-sante.fr/upload/docs/application/pdf/2008-10/dialyse_peritoneale_chronique_chez_ladulte_-_recommandations.pdf
14 - Jenny H. C. Chen, David W. Johnson, Carmel Hawley, Neil Boudville, and Wai H. Lim.Association between causes of peritoneal dialysis technique failure and all-cause mortality. Sci Rep. 2018; 8: 3980
https://dx.doi.org/10.1038%2Fs41598-018-22335-4

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