www.bdd.rdplf.org Volume 5, n° 1, April 2022
https://doi.org/10.25796/bdd.v5i1.64253
ISSN 2607-9917

Bulletin de la Dialyse à Domicile

Does individualization of dialysis treatment have a positive influence on the quality of life of peritoneal dialysis patients while maintaining adequate dialysis?

(L'Individualisation du traitement de dialyse influence-t-elle positivement la qualité de vie des patients en dialyse péritonéale tout en préservant une dialyse adéquate ??)

Guy Fomegne Ngassa[1], Miguel-Ange Guillen[2], Assma Ballout[2], Andreas Bottiggi[3]

[1,2]Service Service de néphrologie, Centre Hospitalier Epicura, site d'Hornu, Belgium
[3]Performance manager, Centre Hospitalier Epicura, Belgium

Note : ce texte est disponible en Français à la même adresse url : https://doi.org/10.25796/bdd.v5i1.64253

Résumé

Notre objectif est d'évaluer l'impact de l'individualisation du traitement de dialyse sur la qualité de vie de nos patients en dialyse péritonéale tout en leur préservant une dialyse adéquate.

La qualité de vie a été évaluée au moins 3 mois après individualisation de la dose de dialyse, par auto questionnaires en utilisant la version SF-36 (short form) de l'échelle KDQOL (Kidney Disease Quality Of Life). Les résultats du KDQOL-SF36 sont utilisés comme variables quantitatives rapportées à l'obtention d'un Kt/V>1,7. La dose de dialyse a été calculée à partir du dialysat et d'urines de 24 heures, des prélèvements sanguins des patients encodés dans le Registre de Dialyse Péritonéale de Langue Française (RDPLF). https://www.rdplf-db.org. Le test de significativité de Pearson est utilisé pour rechercher une corrélation entre les sous scores du SF-36 de l'échelle KDQOL et le Kt/V.

Quinze patients (huit hommes, sept femmes) d'âge moyen de 65.93 ans ont été éligibles pour l'étude.

Nos résultats n'ont pas montré de lien direct entre le Kt/V et la qualité de vie. On note une corrélation existante mais faible entre les sous-scores «fonctionnement physique» et le Kt/V ainsi qu'entre «limitation des rôles dus aux problèmes physiques" et le Kt/V. Ces corrélations ne semblent pas significatives d'après le test de significativité de Pearson. L'individualisation du traitement semble ne pas avoir d'impact négatif sur le Kt/V et certaines dimensions du score KDQOL SF36 paraissent moins altérées (interactions sociales, support social, vie en relation avec les autres). D'autres études prenant en compte les limites de la nôtre sont nécessaires pour généraliser une telle approche thérapeutique.

Mots clés : individualisation de la dose de dialyse ; KDQOL-SF 36 ; Kt/V ; dialyse péritonéale ; qualité de la dialyse ; qualité de la vie.

Summary

Our objective is to evaluate the impact of individualizing dialysis treatment on the quality of life of our peritoneal dialysis (PD) patients while preserving adequate dialysis. The quality of life was assessed at least three months after the individualization of the dialysis dose via self-questionnaires using the short form (SF-36) version of the Kidney Disease Quality of Life (KDQOL) scale. The results of the KDQOL-SF36 scale are used as quantitative variables related to the achievement of a Kt/V >1.7. The dialysis dose was calculated from dialysate and 24-hour urine and blood samples from patients encoded in the French-Language Peritoneal Dialysis Registry (RDPLF) (https://www.rdplf-db.org). Pearson's significance test was used to determine a correlation between the SF-36 sub-scores of the KDQOL scale and Kt/V. Fifteen patients (eight men, seven women) with a mean age of 65.93 years were eligible for the study. Our results did not show a direct relationship between Kt/V and quality of life, but we found an existing but weak correlation between the sub-scores "physical functioning" and Kt/V as well as between "role limitation caused by physical problems" and Kt/V. These correlations do not appear to be significant according to Pearson's significance test. The individualization of the treatment does not seem to have a negative impact on Kt/V, and certain dimensions of the KDQOL-SF36 score seem to be less altered (social interactions, social support, life in relation with others). Further studies taking into account the limitations of our study are necessary to generalize such a therapeutic approach.

Key words : individualization dialysis dose; KDQOL-SF 36; Kt/V; Peritoneal dialysis; quality of dialysis; quality of life

To cite this article : Fomegne G, Guillen M-A, Ballout A, Bottiggi A. Does individualization of dialysis dose positively influence the quality of life of peritoneal dialysis patients while preserving adequate dialysis?. Bull Dial Domic [Internet]. 2022Mar.9 [cited 2022Mar.25];5(1). Available from: https://doi.org/10.25796/bdd.v5i1.64253

INTRODUCTION

When patients reach the stage of terminal uremia, three therapeutic options can be offered—hemodialysis, an extra-renal purification technique mainly carried out in a hospital environment; renal transplantation, which initially depends on transplant list registration that, of course, takes into account the different comorbidities of patients; and finally, peritoneal dialysis (PD), a technique of extra-renal purification performed at home [1]. PD is the least common method of extra-renal purification; it is a continuous technique because it is practiced daily. Listening to these patients and, above all, asking for their opinion or feelings is the best way to identify the weak points of the technique so as to remedy them, improve the patients' quality of life, and avoid burnout in the long term for these patients.

Kidney Disease Quality of Life (KDQOL) is a quality-of-life measurement scale validated by several studies [2–5]. It is a questionnaire based on the SF-36 (short form) and whose questions essentially measure two components, the mental and the physical, along with parts specific to the dialysis patient. A higher score shows a better quality of life [2, 6]. This also helps predict the subsequent occurrence of adverse events such as death or hospitalization: the lower the quality of life, the higher the risk of occurrence of these events [2, 7].

Urea Kt/V measures dialysis dose and urea clearance [8, 9]. Its result reflects the number of times the patient's total water volume has been purified. Urea is taken as a control of the accumulation of uremic toxins and serves as a reference substance to quantify clearance [8, 9]. Similarly, clinical and biological characteristics such as hemoglobinemia, albuminemia, and the presence of comorbidities as well as therapeutic characteristics such as taking medication and especially the individualization of PD treatment could have a positive influence on their quality of life and limit the risk of burnout.

MATERIELS ET METHODES

This is a monocentric cross-sectional study conducted in March 2021 through a self-administered questionnaire. It was administered using standardized instruments to patients treated by PD in the nephrology department of the Epicura hospital center at the Hornu site in Belgium. This questionnaire was completed after the individualization of the dialysis dose in our patients. We used the following inclusion criteria:
1) All adult patients in the PD center for at least three months
2) Consenting patients
3) Patients older than 16 years

Patients with peritonitis or hospitalized within the last three months were excluded. Two of the seventeen patients at the center were excluded—one on manual dialysis hospitalized for peritonitis and the other also on manual dialysis who died at the start of the study during data collection. Both were under four exchanges a day. All the patients at our center benefit from health and disability insurance. Their medical data was collected from medical records. Their quality of life was assessed either on dialysis by the nurses in the department or at their homes using the KDQOL scale. Once the data was collected, the nephrologist calculated the score for each dimension with the help of the hospital statistician. A higher score signifies a better quality of life in this dimension. The KDQOL-SF36 has two cores [3–6]:

A generic core that studies the two components, mental and physical, in eight dimensions:
1) Physical functional status (ten questions)
2) Physical health (four questions)
3) Pain (two questions)
4) General perception of health (five questions)
5) Emotional well-being (five questions)
6) Emotional health (three questions)
7) Social relations (two questions)
8) Energy/fatigue (four questions)

A specific core that studies eleven dimensions:
1) The symptoms of the disease (twelve questions)
2) The burden of kidney disease (four questions)
3) The effect of kidney disease (eight questions)
4) Professional status (two questions)
5) Cognitive functions (three questions)
6) The quality of social interactions (three questions)
7) Sexual function (two questions)
8) Sleep (four questions)
9) Social support (five questions)
10) The encouragement of the caring staff (two questions)
11) Patient satisfaction (one question)

The referent nephrologist then collected the clinical and biological data. The dialysis dose was calculated from the 24-hour dialysate as well as 24-hour urine collections and blood samples obtained from the patient records and entered into the French-Language Peritoneal Dialysis Registry (RDPLF) (https://www.rdplf.org). The glomerular filtration rate (GFR), the mean weekly total creatinine clearance, and the mean weekly Kt/V of urea were obtained using the data entered in the registry and calculated with the “adequate and nutrition module” of the database. We were thus able to collect the adequate dialysis doses (Kt/V) before and after the individualization of the treatments in our patients. We used the results of the KDQOL-SF36 as quantitative variables in relation with a Kt/V >1.7. [3, 4, 10].

STATISTICAL ANANLYSIS

For the analysis of the KDQOL-SF36 questionnaire sub-scores, we also used the free online SF-36 score calculator OrthoToolKit (https://orthotoolkit.com/sf-36/). The Pearson significance test was used to determine a correlation between the SF-36 sub-scores of the KDQOL scale and Kt/V. The eight generic scores and the two summary scores as well as the three specific scores were calculated if at least half the items that make up each dimension were completed. *The eight generic scores and three specific scores were standardized in such a way that 0 corresponds to the worst quality of life and 100 to the best quality of life*.

The SF-36 physical (PCS) and mental (MCS) summary scores were calculated to allow easy comparison with the general U.S. population. Indeed, if the values observed for these two scores are lower than 50, this means that the quality of life is worse than that of the general American population. *The interpretation of the results is different from that of the other dimensions; varia-*

tions of 5 points are even more significant because these scores vary from 10 to 70.

RESULTS

The form was completed in the majority of cases at home (thirteen patients) with the help of the PD nurse (eight patients). Only five of the fifteen patients were able to complete the form without help, and two benefited from the help of relatives.

Characteristics of Patients at the Time of Measuring Quality of Life

More than half of the patients are men (53.33%), and the average age of the participants is 65.93 years. Most of the patients were retired at the time of the study. One patient started dialysis in 2017, two in 2018, six in 2019, and finally five in 2020. The time between starting dialysis and measuring quality of life therefore ranges from seven months to four years. Of the fifteen patients (Table Ia), eight were on CAPD (double-bag Baxter) and seven on an automated PD (APD) using Baxter Homechoicepro® (three on continuous cyclic PD (CCPD) and four on tidal PD). Dialysis treatment was individualized in six of the eight patients on CAPD (the last two continuing their four daily exchanges per day) and two of the seven patients on APD (Table Ib). This individualization had been done in these patients at least three months before the start of our study in March 2021. Of the six patients on CAPD with individualized treatment, two perform four daily exchanges five days a week and only two long exchanges on weekends (icodextrin, one bag per twelve hours), while one performed four daily exchanges six days a week and two icodextrins on Sundays. Finally, three of the six patients performed three exchanges every day (empty peritoneal cavity for four hours a day) with two bags of isotonic solution and one bag of icodextrin. For patients on APD (seven patients), they now perform their treatment with Baxter's new connected machine, the Claria Share Source®, one of the seven patients in CCPD, four in tidal mode. On the other hand, two patients (individualized treatment) alternate between tidal APD (for two months) and CAPD, with three exchanges per day the following month (for one month). These last two patients greatly preferred this option because they felt a little "liberated" from the machine for a month while benefiting from better ultrafiltration during CAPD (Table Ib). Finally, eight of our fifteen patients followed these changes to the treatment plan, and the singular dialogue was woven with these chronic patients. Therefore, one of their requests was met—to lighten the exchanges, especially those during the weekend, along with the desire for more social contact and adaptation in relation to the way of life.

Of the fifteen patients, six are diabetic (40%), and most are on subcutaneous insulin (five of the six patients). Ten patients (66.66%) were hypertensive, and most of the patients had a residual diuresis greater than one liter (100–1,900 ml/day). In addition, two patients presented with a hypo-permeable membrane, eight patients with a moderately permeable membrane, and five patients with a hyperpermeable membrane.

Table I. Treatment at the initiation of peritoneal dialysis and at the time of the quality of life study

a: On initiation of peritoneal dialysis			
Class	System	Number of patients	Percentage
Manual peritoneal dialysis	Baxter® double bag (CAPD)	8	53,33%
APD		7	47%
CCPD	Home choice® Cyclic continuous PD	3	20,00%
Tidal PD	Tidal Home choice PD	4	26,67%
	Total patients	15	
b: At the time of the quality of life study			
Class	System	Number of patients	Perrcentage
	Baxter® double bag	8	53,33%
	4 exchanges/d; 7d/7	2	so 13,33%
Manual peritoneal dialysis	4 exchanges/d; 5d/7 and 2 icodextrines		
	week-end exchanges	2	so 13,33%
	4 exchanges/d; 6d/7 and 2 icodextrines		
	exchanges on Sunday	1	so 6,66%
	3 exchanges/d;7d/7	3	so 20%
APD		7	46,66%
CCPD	Claria ShareSource®	1	so 6,66%
Tidal PD	Tidal Claria ShareSource®	4	so 26,66%
	Tidal Claria ShareSource®/PDm	2	so 13,33%

APD: Automated Peritoneal Dialysis; d: day; CAPD:Continuous Ambulatory Peritoneal Dialysis; PD:Peritoneal Dialysis;CCPD : continuous cyclic peritoneal dialyis

Results Obtained from the Adequate Dialysis Module of the RDPLF Database Before and After the Individualization of Dialysis Doses

We took the last annual assessment carried out before and after the individualization of the treatments. Before individualization, the median GFR was 4 ml/min/1.73 m2, and the ratio of patients with diuresis less than 300 ml is 14.29%. The mean weekly total creatinine clearance was 95.4 L/week/1.73 m2, and the ratio of patients with weekly creatinine clearance <50 L/week/1.73 m2 was 7.14%. Finally, the average weekly Kt/V (dialysis dose (average Kt/V urea)) is 2.2 (Figure 1a). Twelve patients (80%) reached the target of Kt/V urea >1.7 (Figure 1a).
After individualization, the median GFR was 6 ml/min/1.73 m2, and the ratio of patients with diuresis less than 300 ml is 7.69%. The mean weekly total creatinine clearance was 97.31 L/week/1.73 m2, and the ratio of patients with weekly creatinine clearance <50 L/week/1.73 m2 was 7.2%. Finally, the average weekly Kt/V (dialysis dose (average Kt/v urea)) is 2.15 (Figure 1a). Eleven patients (73.33%) reached the target of Kt/V urea >1.7 (Figure 1a)

Quality of Life Measured by SF36

Figure 2 shows the results in our fifteen patients of their quality of life by sex and age group. Only one patient, female, is under 45 years old. She presented with impaired quality of life in almost every dimension except mental health, life and relationship with others, and vitality.

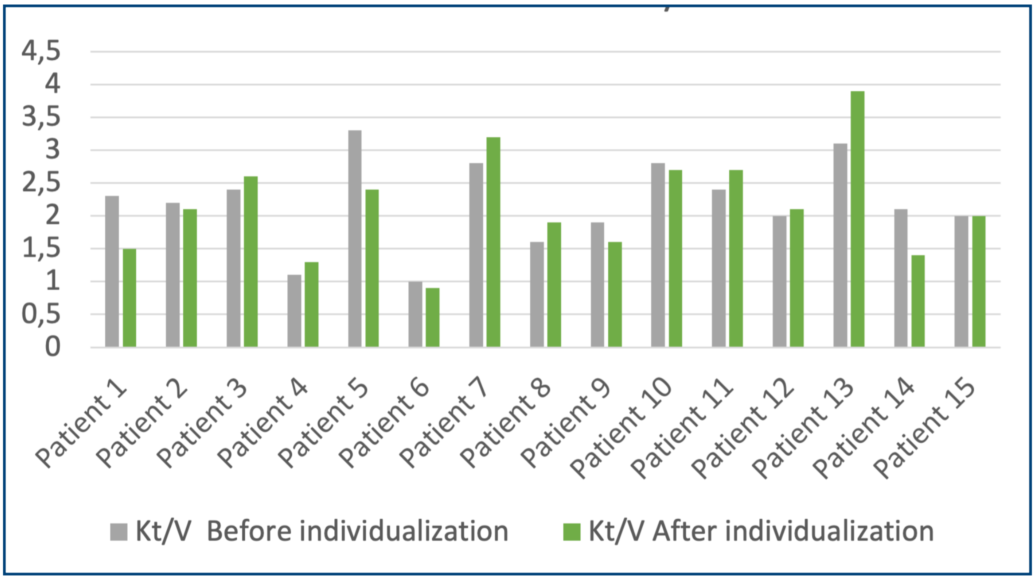


Figure. 1a. Kt/V of urea for each patient before and after indivdualization of dialysis doses

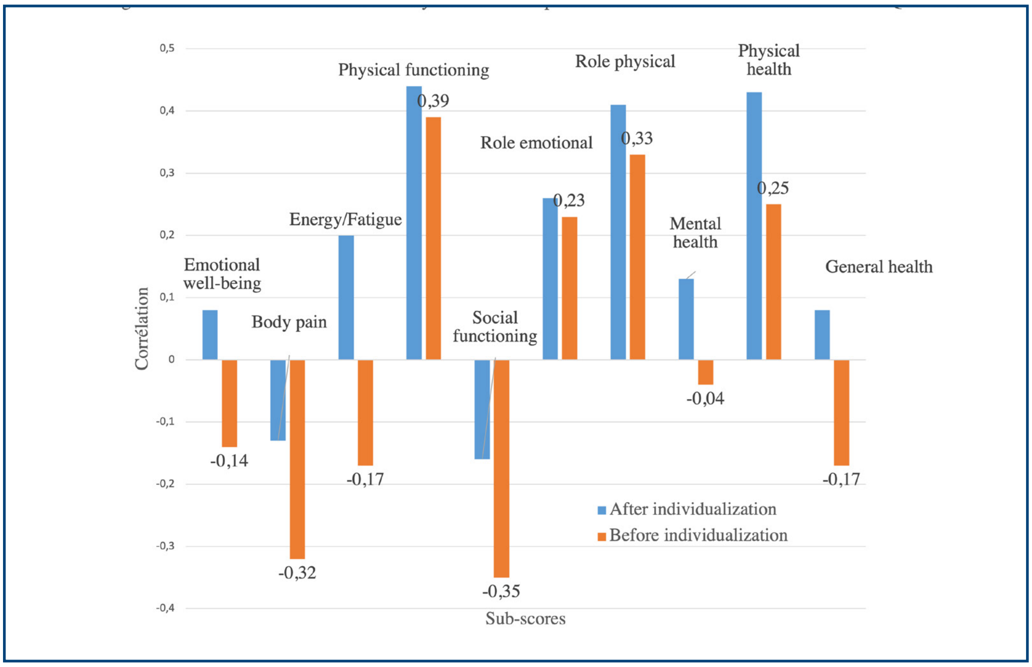
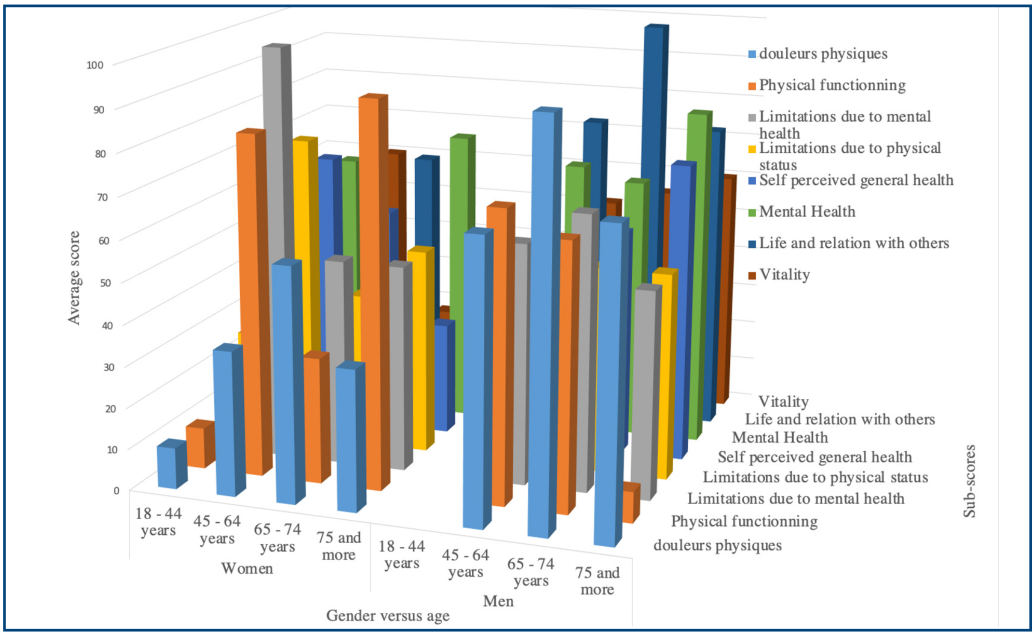


Figure 1b. Correlation between the Kt/V dialysis dose before/after individualization and the subscores of the KDQOL SF-36

The “physical pain” score is among the lowest, especially in the female subjects. The women on dialysis in almost all age groups reported a lower quality of life than the men in almost all dimensions of the SF36, with the exception of the dimension “limitations caused by mental state.” The women also had a lower quality of life than the men for the summary physical score. Overall, the quality of life of dialysis patients tends to decrease sharply with age in the physical component dimensions (physical functioning, limitations caused by physical condition, physical pain, and general health) as well as for the physical score summary for both men and women. We also note a decrease with age in the scores relating to the “limitations caused by mental state” and “vitality” dimensions. We find these results to be consistent in many previous articles described in the literature [11–15].

The proportion of subjects with a very impaired quality of life varies from 0% to more than 40% in the dimensions with a physical component and from 7% to more than 33% for the dimensions with a mental component. This alteration in quality of life was highest in both dimensions in patients under the age of 45. Overall, despite this impaired quality of life in the physical and mental components of SF36, the patients describe somewhat less impaired general health compared to the results described in the literature [3, 4, 10], no doubt a possible favoring role of the individualization of their treatment.

The KDQOL-SF36 scale has two cores [3–6]: a generic core, which studies the two components, mental and physical, in eight dimensions; and a specific core, which studies eleven dimensions. Figure 3 shows the results of the specific and generic cores of the KDQOL™ -SF36 Scoring Program (v2.0) among the fifteen patients of the study: essentially, three out of eleven dimensions of the specific core alter the quality of life of our patients (the symptoms, the burden of kidney disease, and the effect of kidney disease). Few of the patients wished to respond to certain dimensions such as sexual function and professional status. As for the other dimensions of the specific core of the SF36 (cognitive functions, quality of social interactions, sleep, social support, encouragement from treating staff, patient satisfaction), the scores were rather in favor of a less impaired quality of life, with the patients insisting on the beneficial effect of adapting their treatment to their lifestyle. For the generic core of KDQOL-SF36 (Figure 3), physical health, although impaired, was uniform in most patients. Only five patients described less impaired physical health, while mental health was clearly impaired in six of the fifteen patients, with the remaining nine reporting stable or improved mental health.



⬆ *Figure 2. average quality of life score of chronic renal failure patients treated by PD, versus sex, age category and sub-score.*

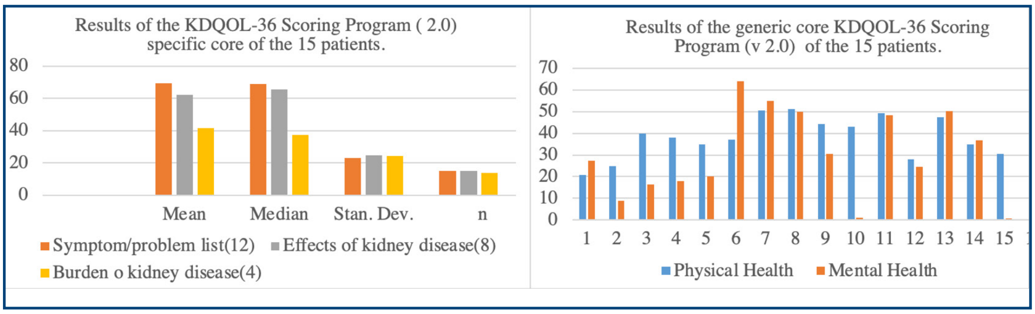


Figure 3. Results of the specific scores and the generic scores of the KDQOL™ -36 Scoring Program (v 2.0) in the 15 patients of the study. The other dimensions of the specific nucleus are not included because they are below the required score. At the level of the generic nucleus, mental health is strongly impaired in six of the fifteen patients. Physical health, although impaired, is more even. Five patients do not describe any deterioration in their physical health.

DISCUSSION

Fifteen patients from our center were included in this study. In CAPD, patients usually perform four daily exchanges per day; in APD, these exchanges generally take place at night [6, 16–18]. Two of the eight CAPD patients had only two exchanges of icodextrin over the weekend, one of which was the whole weekend and the other only on Sunday. This individualized treatment not only met their expectations but also made it possible to improve their poorer average ultrafiltration on isotonic dialysates at the end of the week. On the other hand, two of the seven patients on APD alternated between tidal APD (for two months) and CAPD with three exchanges per day (for one month). These last two patients greatly preferred this option because they felt a little “liberated” from the machine for a month while benefiting from better ultrafiltration during CAPD. Incidentally, on average one day once a month, both the APD and CAPD patients performed only two icodextrin exchanges when they were planning family events or activities during the day. These treatment adaptations of our patients compared to the usual regimens [19, 20] led us to carry out this work so as to assess their real impact on their quality of life while preserving adequate dialysis.

According to our results above (Figure Ia), the dialysis dose (Kt/V) remains satisfactory in our patients [10]. Individualization does not seem to have a negative impact on Kt/V. Seven out of the fifteen patients also show Kt/V equal or even close to the initial Kt/V during the second measurement, after individualization of the dialysis treatment. We note an existing but weak correlation between the “physical functioning” sub-scores and Kt/V as well as between “limitation of roles caused by physical problems” and Kt/V (Figure 1b). These correlations do not appear to be significant according to the Pearson significance test. Indeed, from what is commonly accepted, a non-zero correlation is weak if it is less than 0.5 (positive relationship) or greater than –0.5 (negative relationship). In this case, none of the sub-scores show a strong correlation with the measurement of Kt/V before and after the individualization of the dialysis dose (significance test: r (n 1;0.05): r (14;0.05) = 0.4973 if 0.4973 > correlation coefficient, no significant relationship). Our results do not show any real links between the measurement of quality of life and Kt/V (Figure 1b). As found in the literature [5, 6, 12, 13], the quality of life is altered both in the generic core and in the specific core of the SF36 questionnaire (Figure 3), mainly in their physical components (symptoms of kidney disease, effects and burden of kidney disease, physical health). Mental health is also impaired in some of these patients, as similarly described in previous articles [19, 20]. However, in most of our patients, some dimensions of these scores seem less altered, in particular everything concerning social interactions, social support, and life in relation to others. Individualized treatment compared to conventional schemes in PD, taking into account the lifestyle and specificity of each patient, would therefore, in our opinion, contribute to better social interaction and more social support. We believe that this individualization of treatment in relation to their lifestyle would therefore allow better therapeutic compliance and would contribute to not omitting the prescribed peritoneal exchanges. Indeed, two studies have shown that patients' disrespect of the prescription of peritoneal exchanges was correlated with a poorer quality of life and more frequent uremic complications requiring the use of hemodialysis sessions [21, 22].

They concluded that home visits by the nursing staff as well as the involvement of another person of the entourage were a good way to encourage the patient to be more observant [25]. Our results show that adapting the PD treatment regimen to each patient does not necessarily have unfavorable effects on the different components of SF36 and are also close to data collected in the literature [3, 6, 15, 17, 26]. Better yet, while some of our patients describe more vitality, the burden of kidney disease seems more accepted, which may be due to their greater social interaction and support. Nor does it seem to have a negative impact on Kt/V, an essential criterion for measuring the dialysis dose.

However, our work suffers from certain limitations. In addition to the limited number of patients, we believe that the questionnaire could have been completed before and after the individualization of treatments to measure the effect on the sub-scores of quality of life. We were only able to perform a correlation analysis between the sub-scores and Kt/V given the lack of means for this purpose (statistical software etc.) and of usable data. It is undoubtedly necessary to plan other subsequent studies taking into account these limits and including a larger number of patients while also exploring other parameters of adequacy (nutritional aspect, ultrafiltration, long-term maintenance of residual diuresis, parameters of infections) to generalize such an approach in the follow-up of these chronic patients.

CONCLUSION

End-stage renal failure has an unfavorable impact on the lives of patients, in particular through the limitations of their activities, social restrictions, the burden of renal disease, the heaviness of treatments, etc. Our study, subject to the small number of patients included, seems to show that the individualization of the treatment compared to the usual schemes and taking into account the specificity of each patient would not have an unfavorable impact on the dose of dialysis (dialysis adequate). This confirms, as in the literature, an alteration in the quality of life in certain dimensions of the SF36 sub-score, particularly in their physical components. Conversely, the increase in social interactions and support could contribute to improving their quality of life while maintaining an adequate dose of dialysis as a result of better therapeutic compliance. Other studies with a larger number of patients and other adequacy parameters are necessary to generalize this therapeutic approach.

Authors of the text : Guy Fomegne ensured the design and writing of the article, ensured the search for bibliographical references and participated in the collection of data and the statistical interpretation. Miguel Guillien participated in the search for references and proofread the text. Assma Ballout participated in the search for references and proofread the text. Andreas Bottiggi

participated in the design of the article, carried out the data encoding, carried out the statistical analyses, designed the graphics, proofread the text.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this article.

ACKNOWLEDGMENTS

We would like to thank Sophie Viart and Lorella Gaddi, coordinators of clinical studies, who helped us to complete this article. We also thank Christine Piesen who helped us resolve the ethical details before submitting the article to our hospital's ethics committee.

REFERENCES

1 - Rosenberg M. Overview of the management of chronic kidney disease in adults. https://www.uptodate.com/contents/search. Accessed April 26, 2021.

2 - Kalender B, Ozdemir AC, Dervisoglu E, Ozdemir O. Quality of life in chronic kidney disease: effects of treatment modality, depression, malnutrition and inflammation. Int J Clin Pract. 2007;61:569–76. 10.1111/j.1742-1241.2006.01251.x [PubMed] [Google Scholar]

3 - Salim K. Mujais, Ken Story, John Brouillette, Tomoko Takano, Steven Soroka, Catherine Franek,† David Mendelssohn, and Frederic O. Finkelstein. Health-related Quality of Life in CKD Patients: Correlates and Evolution over Time. Clin J Am Soc Nephrol. 2009 Aug; 4(8): 1293–1301.

4 - Cohen, D.E., Lee, A., Sibbel, S. et al. Use of the KDQOL-36™ for assessment of health-related quality of life among dialysis patients in the United States. BMC Nephrol 20, 112 (2019). https://doi.org/10.1186/s12882-019-1295-0

5 - Kurella M, Luan J, Yaffe K, Chertow GM. Validation of the Kidney Disease Quality of Life (KDQOL) cognitive function subscale. Kidney Int 2004;66(6):2361-7.

6 - https://www.agence-biomedecine.fr/R-E-I-N-Reseau-Epidemiologique-et-Information-en-Nephrologie. Les chiffres du REIN. Enquête qualité de vie. Mise à jour 24 juin 2021.

7 - Mapes DL, Lopes AA, Satayathum S, McCullough KP, Goodkin DA, Locatelli F, Fukuhara S, Young EW, Kurokawa K, Saito A, Bommer J, Wolfe RA, Held PJ, Port FK. Health-related quality of life as a predictor of mortality and hospitalization: the Dialysis Outcomes and Practice Patterns Study (DOPPS). Kidney Int 2003;64(1):339-49.

8 - Michael Rocco J. Michael Soucie, Stephen Pastan, and William M. Mc Clellan. Peritoneal dialysis adequacy and risk of death. Kidney International, Vol. 58 (2000), pp. 446–457

9 - Scott J. Schurman Lawrence R. Shoemaker, Bradley A. Warady. Urea kinetic analysis of automated peritoneal dialysis allows calculation of a CAPD-equivalent Kt/Vurea. Kidney Internation¬nal 2000 ;58(3) :1318-1324.

10 - Al Borgi yassine, El Alaoui A, Benlachhab Z, Toutti W, SaghirBahah M, Jerghich K, Ghita B, Amal Chouhani B, Kabbali N, El Rhazi K, Sqalli T. Relation entre la dose de dialyse et la qualité de vie des patients en dialyse péritonéale. Bull Dial Domic [Internet]. 9déc.2019. Volume 2, n° 4, Décembre 2019 https://doi.org/10.25796/bdd.v2i4.23553

11 - Maria Carolina Cruz, Carolina Andrade, Milton Urrutia, Sergio Draibe, Luiz Antônio Nogueira-Martins, Ricardo de Castro Cintra Sesso. Quality of life in patients with chronic kidney disease, CLINICS 2011;66(6):991-995

12 - Judith Tommel, Andrea W.M. Evers, Henk W. van Hamersvelt, Rien Jordens, Sandra van Dijk, Luuk B. Hilbrands, Henriët van Middendorp, For the E-HELD Study Group. Predicting health-related quality of life in dialysis patients: Factors related to negative outcome expectancies and social support Patient Education and Counseling 104(2021) 1474-1480.

13 - Bakewell AB, Higgins RM, Edmunds ME. Quality of life in peritoneal dialysis patients: decline over time and association with clinical outcomes. Kidney Int 2002;61(1):239-48.

14 - Wu AW, Fink NE, Marsh-Manzi JV, Meyer KB, Finkelstein FO, Chapman MM, Powe NR. Changes in quality of life during hemodialysis and peritoneal dialysis treatment: generic and disease specific measures. J Am Soc Nephrol 2004;15(3):743-53.

15 - Baiardi F, Degli EE, Cocchi R, Fabbri A, Sturani A, Valpiani G, Fusarol M. Effects of clinical and individual variables on quality of life in chronic renal failure patients. J Nephrol 2002;15(1):61-67.

[16] K/DOQI. K/DOQI clinical practice guidelines for peritoneal dialysis adequacy.
Am J Kidney Dis 2005; 20(Suppl. 9): S1.

17 - Bernardini J, Price V, Figueiredo A, Peritoneal dialysis patient training, 2006. Perit Dial Int 2006; 26:625–632.

18 - Peritoneal dialysis adequacy. Am J Kidney Dis 2006 Jul;48 Suppl 1:S98-129

19 - Ginieri-Coccossis, P Theofilou, C Synodinou, V Tomaras1 and C Soldatos. Quality of life, mental health and health beliefs in haemodialysis and peritoneal dialysis patients: Investigating differences in early and later years of current treatment. BMC Nephrology 2008, 9:14 doi:10.1186/1471-2369-9-14

20 - Baiardi F, Degli EE, Cocchi R, Fabbri A, Sturani A, Valpiani G, Fusarol M. Effects of clinical and individual variables on quality of life in chronic renal failure patients. J Nephrol 2002;15(1):61-67.

21 - Bernardini J, Nagy M, Piraino B. Pattern of noncom¬pliance with dialysis exchanges in peritoneal dialysis patients. Am J Kidney Dis. 2000 Jun;35(6):1104-10.

22 - JC Korevaar, Validation de KDQOL-SF ™ : une me¬sure de santé ciblée sur la dialyse. Recherche sur la qua-lité de vie 2002;11(5) : 437-447.

23 - Bernardini J, Piraino B. Compliance in CAPD and CCPD patients as measured by supply inventories du-ring home visits. Am J Kidney Dis. 1998 Jan;31(1):101-7.

24 - JC Korevaar, Validation de KDQOL-SF ™ : une me¬sure de santé ciblée sur la dialyse. Recherche sur la qua-lité de vie 2002;11(5) : 437-447.

Received 2022/01/24 accepted after revision 2022/02/27, published 2022/04/06