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RESEARCH ARTICLE

PROXIMITY THERAPEUTIC EDUCATION FOR PATIENTS WITH CHRONIC KIDNEY DISEASE: A NEW STRATEGY FOR BETTER MANAGEMENT

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ABSTRACT

The chronic kidney disease is a public health problem in aggravation. The management requires best conditions for dialysis initiation. The national and international recommendations suggest multidisciplinary management of chronic disease. We report here the experience of "Lot-et-Garonne" regarding the benefits of a proximity nurses and dietitians counseling. Since its five years of existence, we would evaluate the impacts of the proximity therapeutic education offered by theses paramedical teams in the management of patients with chronic kidney disease. The main objective is to determine if the Proximity Nurse and Dietitian Counseling could reduce the emergency dialysis. We have selected 212 patients new dialyzed, divided into 3 groups according to the types of consultations which they have benefited. The main objective is to determine if the Proximity Nurse and Dietitian Counseling could decrease the emergency dialysis. The others objectifs are to determine if it could increase the using of native fistula for starting the dialysis, secondly if it could increase the rate of dialysis in satellites dialysis center and finally if it could increase the survival rate one year after starting the dialysis. During this study, patients were divided into 3 groups according to the types of consultations which they have benefited. So, 93 patients were followed exclusively by nephrologists, 76 have had a medical nephrology monitoring and hospital nurse consultation and 43 have benefited the Proximity Nurse and Dietitian Counseling in ad of both previous consultations. The proximity Nurse and Dietitian Counseling allowed to decrease significantly the emergency dialysis in 43% to 20.28%. It could increased significantly also the using of artery veinous fistula passing 44.09% in Groupe 1 to 90,7% in Groupe 3 and the transfert in Satellites Auto-Dialysis Unit or Antennas passing 39.78% to 74.42% in the two previous groupes without changing the survival rate. The presence of the paramedical management including nurse and dietitian counseling are close substitutes consultations. Sometimes, they induce medical consultations required for strict monitoring of patients. Its benefits is not only reducing the emergency dialysis but also promoting the using of artery veinous fistula and the hemodialysis in antennas and so producing different economic impacts at all levels. The proximity educational therapeutic helped for managing the patients with chronic kidney disease. It should be included in their care management.

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INTRODUCTION

Chronic kidney disease (CKD) remains a public health problem in aggravation (Arikan *et al.,* 2012). The management of this disease requires optimal conditions to start hemodialysis. The national and international recommendations suggest to prepare hemodialysis very earlier since stage 4 and to use Arteriovenous Fistula as an an access vascular (High Authority of Health, 2012; Levey, 2012).

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Despite the presence of nephrology medical follows-up, the rate of patient starting dialysis in emergency and using catheter don't stop to increase. The Dialysis Outcomes Practice Patterns Study (DOPPS) concluded that the rate of using catheter in dialysis increased significantly from 58% to 68% between 2005 and 2009 (Pisoni *et al.,* 2009). In Mendelssohn's meta-analysis, eight European studies had shown that starting dialysis in emergency had significantly worsen results than scheduled dialysis (Mendelssohn *et al.,* 2009). In the Center where this study was conducted, the incidence of new dialyzed patients has increased steadingly. In 2008, the center received 57 new dialyzed patients, 37 of them were dialyzed in emergency and 27 started with catheter. These facts was

judged as bad conditions for patients with CKD and required solutions for better management. So, this study focused on the added of the paramedical management interests which several studies had been demonstrated. In addition, the insufficiency of the nephrologists on the center imposed also to find solutions for CKD management. The nephrology department has created paramedical care for CKD including the Hospital Nurse Consultation (HNC) in 1996 and recently in 2009 the Proximity Nurse and Dietitian Counseling (PNDC). The application of the PNDC was accepted by the Regional Agency of Health, was created by financial help of the AURAD Aquitaine (Association d'Utilisation des Reins Artificiels en Dialyse or Association of Using Artificial Kidneys in Aquitaine). Its objective is to promote access to CKD paramedical follows-up through community and its principe based on therapeutic education. The main objective of this study is to determine if the addition of the PNDC to a single nephrology medical consultation could reduce the rate of dialysis in emergency. The other objectives are to determine if PNDC could secondly increase the use of arterio-veinous fistula in the first session, and if it can also promote the dialysis in antennas and finally change the survival rate of patients one year later after starting dialysis.

MATERIALS AND METHODS

The National Epidemiological Information Registry (REIN) and the Hospital Data allowed us to extract the data of the patients. This is a retrospective study in a single center from 01st January 2009 until 31st December 2013. We selected parameters such as age at starting of dialysis, sex, nephropathy causal and estimated Glomerular Filtration Rate (eGFR) at the first session, types and numbers of comorbidities including smoking, cardiovascular comorbidities, Cancer, chronic respiratory failure. We counted the numbers of medical and paramedical consultations performed one year before dialysis. Patients were divided into 3 groups according to the types of consultations they received. Group 1 included all patients who have been monitored exclusively by nephrologists. Group 2 included patients who were followed by both nephrologists and had benefited HNC. And finally Group 3 were the patients who benefited the PNDC in addition to these 2 types of consultations. The flow chart summarized how we have selected patients (Figure 1). The two paramedical consultations are carried out independently of the medical consultation. As a statistical analysis, we used JMP 10 software from SAS Institute Cary, NC, USA, with analysis of variance for comparisons between 2 value groups and contingency analysis for differences in the distribution of nominal values. As description, the PNDC is an mobile consultation in the 10 satellites dialysis centers in Lot-et-Garonne region in France. These satellites dialysis includes Pont-du-Casse, Boe, Nérac, Ligardes, Pujols, Fumel, Sainte Livrade, Marmande, Tonneins and Casteljaloux antennas. It was created in 2009 and is considered by the Regional Agency of Health (ARS) as a field of therapeutic education. Every patients were advised systematically to follow PNDC in their nearest and proximity antennas. The PNDC is composed by a nurse and a dietitian who have already been trained for therapeutic education. Planning is done every six months. The duration of a consultation remains about 45 minutes per patient. The consultation is done every four weeks in each satellites - dialysis centers. At the end of the consultation, a summary letter is faxed and mailed to the nephrologists and the attending physicians.

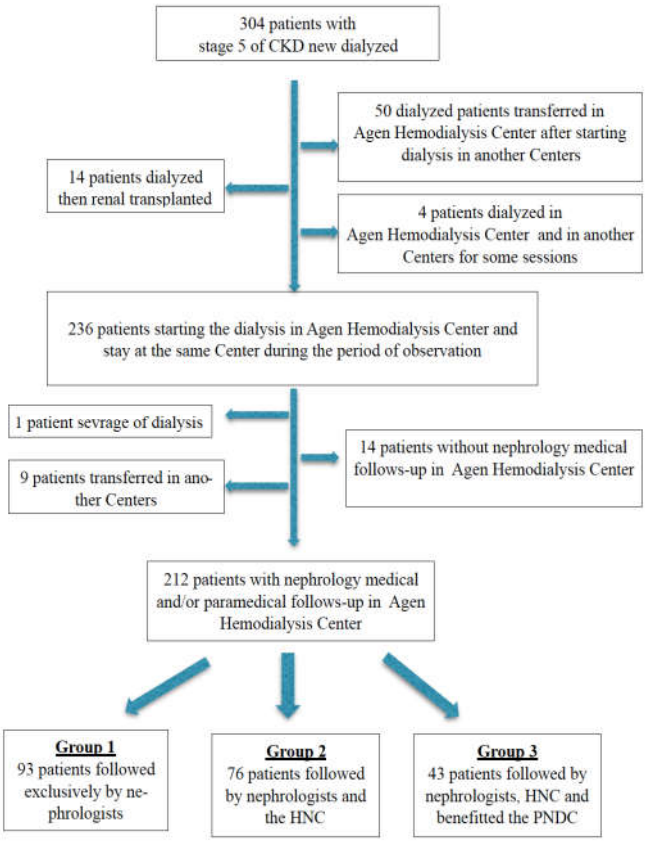

Figure 1. Flowshart for patients selection

RESULTS

During this study, we retained 212 patients with nephrology medical follows-up with or without paramedical management. Patient selection is summarized in Figure 1. Patients's characteristics are summarized in Table I. In the total cohort, the mean age was 75 with extremes of 26 and 96 years old.

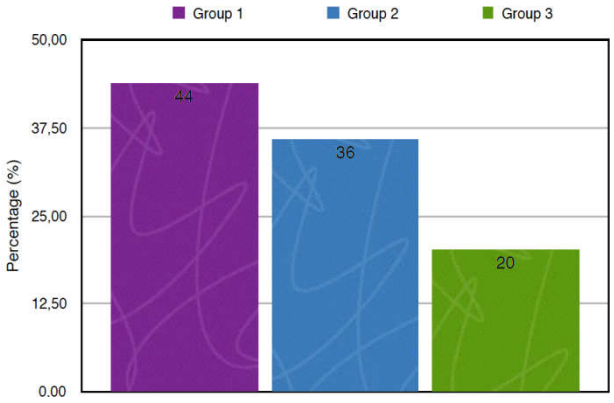

Figure 2. Repartition according to the dialysis initiation in emergency (p value<0.05)

The sex ratio was 1.9 with male predominance. The number of medical consultations was significantly lower in group 1. The mean number of comorbidities was 3 per patient with no significant difference in 3 groups. The mean eGFR at the 1st session was 8.22mg / ml / 1.73 m2 with a eGFR higher in Group 3. Concerning the causes of CKD, Vascular nephropathy, nephropathy associated with diabetes and polycystic disease were the majorities of causes, with no significant difference between the 3 groups.

Table 1. Characteristics of the patients (n= 212)

	Group 1	Group 2	Group 3
Mean age (years old)*	76+/-1,4	73+/-1,6	77+/-2,1
Sex ratio (M/F)*	1.9	1.8	1.9
Numbers of co morbidities*	3	2	3
eGFR at the first session* (ml/mm/1.73m^2)	8.009	8.08	9.48
Number of medical nephrology consultation one year before starting dialysis	5	7	7
Number of HNC one year before starting dialysis**	0	1	2
Number of PNDC one year before starting dialysis**	0	0	2

*: non significative statistical test; **: p value < 0.05

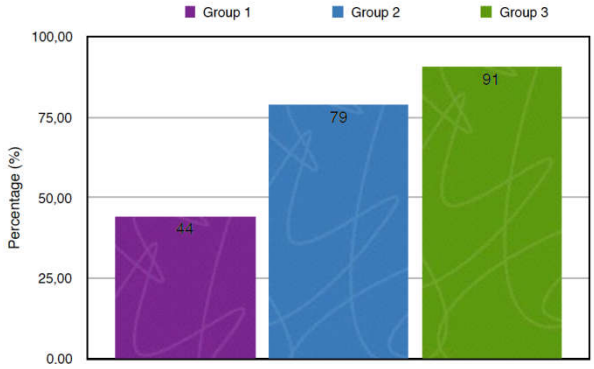

Figure 3. Repartition according to the using arteriovenous fistuia in the firest session (p value < 0.05)

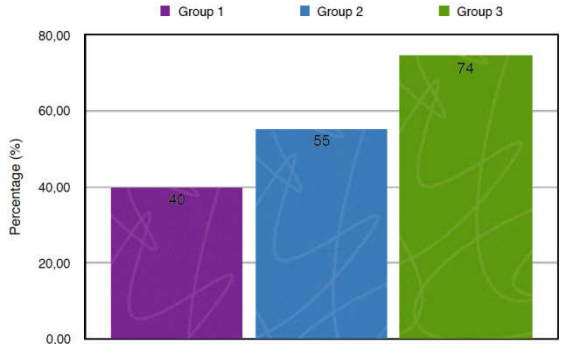

Figure 4. Repartition according to the transfert of the patients to the satellites Auto-Dialysis Unit (p value < 0.05)

The results respecting the achievement of the various objectives are summarized in Figures 2-5. The rate of emergency dialysis in Group 1 was 43.87%. The addition of HNC reduced it significantly to 35.85% in Group 2 and only 20.28% in Group 3. The addition of paramedical consultations promoted also significantly the using of arteriovenous fistula as well transferring patient in Satellites Auto-Dialysis Unit. They were respectively 44.09% and 39.78% in Group 1, 78, 95% and 55, 26% in Group 2, 90.7% and 74.42% in Group 3. Concerning the survival rate one year after starting dialysis, it was 82.08% in total cohort, with no significant difference between the 3 groups.

DISCUSSION

The decision to start dialysis in patients with CKD remains difficult. It should not be too early to upset the daily life of patients nor too late pour to lose the patients. The KDOQI guideline suggests preparing patients for prophylaxis treatment from Stage 3b, creating the FAV in Stage 4 and starting dialysis in Stage 5 (Levey, 2012). Despite the presence of nephrology medical follows-up, several patients began dialysis with catastrophic conditions such as emergency dialysis or using catheter, inducing high morbidity and mortality.

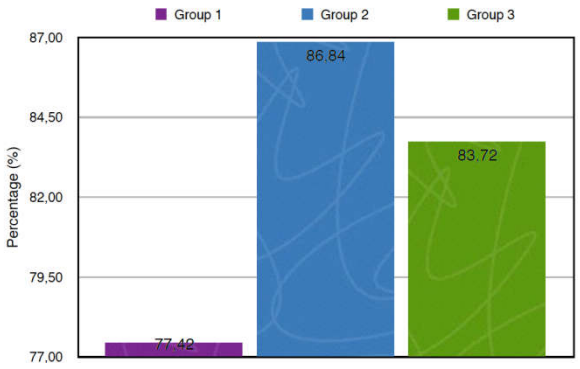

Figure 5. Répartition according to survival rate on year after dialysis initiation (p valu non significative)

In this study, despite the medical follows-up of nephrologists, the rate of emergency dialysis was very high in 43.87% of cases. According to Hoffman, its rate was 48% due especially to pulmonary acute edema and dialysis on a femoral and tunneled catheter were respectively 17% and 15% (Hoffmann *et al.,* 2006). Since 2012, the High Authority of Health (HAS) suggested to take in charge in multidisciplinary management the CKD (Chantrel *et al.,* 2010). The presence of the PNDC reduced significantly the rate of emergency dialysis. It is not a consultation for the replacement of a medical consultation but rather a substitution. It can lead to significant medical consultations, such in case when a nephrologist is needed for prescription of some medecines. These paramedical consultation adds up medical consultations wich increases frequently the monitoring of patients. In this study, we did not find a correlation between dialysis in emergency with age nor cause of the CKD nor comorbidities nor numbers of comorbidities. But it depends significantly on the level of eGFR : « The lower the GFR is , the higher the risk of emergency dialysis is ». Elisabeth et al, found in their study that the presence of a multidisciplinary care could slow down the annual decline of the eGFR (Bayliss *et al.,* 2011). Moreover, dialysis on a artery venous fistula remains the current first-line vascular access due to its longevity and also the exposure to a lower rate of complications including thromboses and infections (Bourquelot *et al.,* 2009; Canaud *et al.,* 1999). Preparing patients for extra renal therapy is also one goal of the PNDC. Dialysis on arteriovenous fistula is usually used during a scheduled dialysis. We have nevertheless found some special scheduled dialysis in 20% using catheter, lower rate than in Chantrel's observation with 24% scheduled dialysis using catheter (Chantrel *et al.,* 2010). The reasons were mainly the mediocrity of the patient's vascular condition because of elderness. Concerning the transfer in Satellites Auto-Dialysis Unit, the rate was very high compared to the national average. This can be explained by the preferential transfer of the service. But it could also be linked by the attractive role played by these paramedical teams.

Until its existence, the prevalence of new dialyzed in Center didn't stop to increase and there were few patients who were dialyzed in antennas. In 1996, when the HNC was created for paramedical management of CKD, the numbers of patients dialyzed in Center and in Satellites Auto-Dialysis Unit were equals and remained stable. But from the moment when the PNDC was created in 2009, there was a considerable growth of patients dialyzed in Satellites Auto-Dialysis Unit. One Canadian study concluded that the presence of an education Therapeutic performed by nurses during the initiation of dialysis could offer to the patients different modality of treatment such as dialysis out center including peritoneal dialysis, home dialysis and renal transplantation (Hanko *et al.,* 2011). Although in some American studies, the presence of paramedical follows-up can improve patient survival rate (Tamura *et al.,* 2013), this study could not demonstrate this hypothesis despite the presence of PNDC. Age and comorbidities limited survival rate. The tendency to a non-significant increasing survival rate in Group 2 and 3 can be explained by the effect of Therapeutic Education promoted by these paramedical teams. Our study has some limits because of its retrospective nature with few population. But, the strong points was mainly the homogeneity of three groups compared particularly on the age, the numbers of comorbidities and also on the eGFR. This is a mobile strategy which could bring some benefits for patients and for the State such as saving time, offering comfortable life due to the existence of the diatetitian counseling, decreasing the morbidity. Every patients with scheduled dialysis started dialysis in antennas and didn't need hospitalisation. Using arteriovenous fistula exposed too less infectious complication that using catheter. So, PNDC could reduce or avoid hospitalization and it decreases the total costs of hemodialysis session. Several study concluded that dialyzing in antennas are less expensive than dialysis in hemodialysis center.

Conclusion

The multidisciplinary management of CKD can be beneficial for patients and it is necessary mainly during the period of preparatory of extra renal therapy. In this study, we report the impacts of the multidisciplinary management of CKD and specify the interests of the proximity paramedical counseling through community based on therapeutic education. The PNDC could decrease the dialysis in emergency and could promote the using of arteriovenous fistula and the transfer in Satellites Auto-Dialysis Unit or Antennas. But, it could not unfortunately improve survival because of age and comorbidities. These short-term as well as long-term benefits could be evaluated at different levels not only for the patient but also for the state. In a developed country, the decrease in the frequency of dialysis in emergency, and the development of starting dialysis with fistula decrease the morbidity of CKD. While in a developing country the implementation of these paramedical counseling to follow up patients with CKD could substitute a lack of nephrologists and help patients who live far from hospital, perhaps it could also slow the progression of CKD or delay dialysis. One similar study in Madagascar could be effected.

Conflict of interest: None

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