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Le Bulletin de la Dialyse à Domicile

UNDERUTILIZATION OF HOME DIALYSIS IN THE UNITED STATES: MISSED OPPORTUNITIES FOR QUALITY IMPROVEMENT

LA DIALYSE A DOMICILE AUX ETATS UNIS :OPPORTUNITE MANQUEE

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Résumé

La dialyse à domicile, en particulier la dialyse péritonéale présente des avantages potentiels sur l'hémodialyse en centre à plusieurs niveaux, notamment le coût moins élevé des soins et le taux inférieur de la mortalité. Pourtant la Registre nationale de l'Insuffisance Rénale Chronique Terminale aux Etats Unis (The United States Renal Data System-USRDS) indique que l'incidence et la prévalence de la dialyse à domicile restent sous-utilisées par rapport à l'hémodialyse en centre. Un changement de la politique nationale sur la dialyse à domicile pourrait améliorer la qualité des soins et réduire la mortalité et le coût des soins des patients atteints d'insuffisance rénale chronique terminale. Cet article est principalement basé sur le rapport annuel 2017 de l'USRDS, et centré sur une opportunité potentiellement manquée dont la cause est une sous utilisation de l'hémodialyse à domicile et particulièrement la dialyse péritonéale, aux US.

Mots clés : Dialyse à domicile. Dialyse péritonéale. Hé -modialyse en centre. Abords vasculaires d'hémodialyse. Mortalité, Morbidité.

Abstract

Home dialysis may offer many potential advantages over in-center hemodialysis: lower cost, better quality of care and lower mortality. However, the United States Renal Data System (USRDS) which is a national data system that collects, analyzes, and distributes information about chronic kidney disease (CKD) and end-stage renal disease (ESRD) in the United States, indicates that the incidence and prevalence of home dialysis remains under-utilized compared with in-center hemodialysis. Future changes in national policy on dialysis may bring about an increase in home dialysis and potentially improve the care and cost in dialysis. This paper is mostly based on the 2017 USRDS Annual Report and centered on the potential missed opportunity caused by the underuse of home dialysis, especially peritoneal dialysis in the US.

Keywords : Home dialysis. Peritoneal dialysis. In center Hemodialysis. Hemodialysis vascular access. Dialysis Clinical Outcomes. Dialysis mortality. Dialysis Morbidities

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INTRODUCTION

The United States Renal Data System (USRDS) is a national data system that collects, analyzes, and distributes information about chronic kidney disease (CKD) and end-stage renal disease (ESRD) in the United States. USRDS publishes an annual report to characterize the ESRD population; to describe the prevalence and incidence of ESRD along with trends in mortality and disease rates; to investigate relationships among patient demographics, treatment modalities, and morbidity; to report the costs of ESRD treatments and total burden of ESRD program in the United States; and to identify new areas for special renal studies and support investigator-initiated research. The data used in this paper is based essentially on the 2017 USRDS Annual report, which relate to annual data obtained at the end of 2015 (1)

PREVALENCE OF ESRD

At the end of 2015, USRDS reported 703243 prevalent patients with ESRD, an increase by 3.4% compared with 2014.

MODALLITES OF RENAL REPLACEMENT THERAPY

Among prevalent ESRD patients at the end of 2015, 63.2% were on in-center and home hemodialysis (HD), 7.0% on peritoneal dialysis (PD) and 29.6% with functioning kidney transplant (Figure 1)

Among incident ESRD patients in 2015, 87.7% were initiated in incenter and home HD, 9.6% on PD and 2.5% received a kidney transplant (Figure 2)

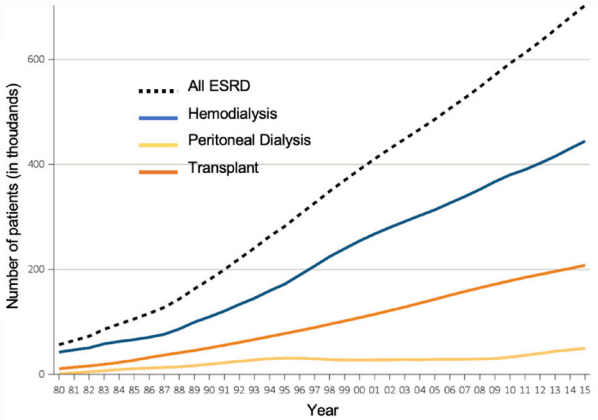

Figure 1. Changes in numbers of prevalent patients by modalities of renal replacement therapies in ESRD population 1980-2015; (United States Renal Data System. 2017 USRDS annual data report: Epidemiology of kidney disease in the United States. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2017. Abbreviation: ESRD, end-stage renal disease)

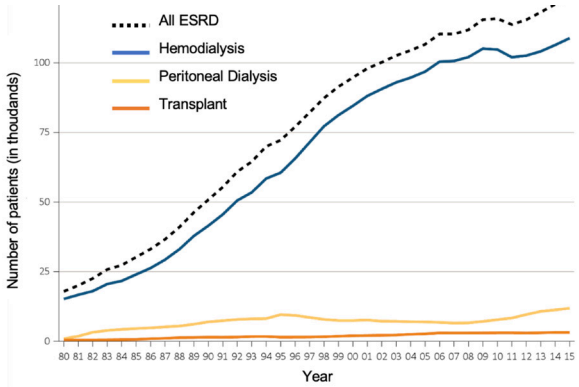

Figure 2. Change in numbers of incident patients by types of renal replacement therapies in ESRD population 1980-2015 (United States Renal Data System. 2017 USRDS)

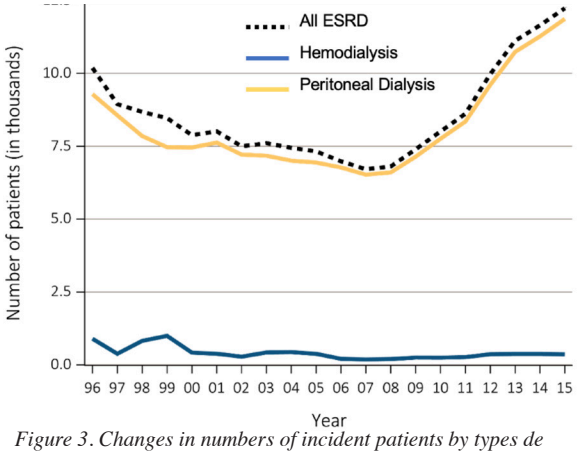

Figure 3. Changes in numbers of incident patients by types de homedialysis in ESRD population 1996-2015 (United States Renal Data System. 2017 USRDS)

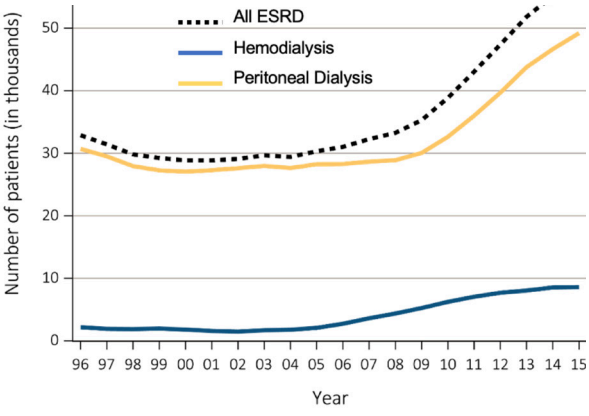

Figure 4. Changes in numbers of prevalent patients per types of home dialysis in ESRD population 1996-2015 (United States Renal Data System. 2017 USRDS)

Incidence of home dialysis had risen during past years. In 2015, home dialysis incidence was 82% higher than in 2007 (Figure 3). This increase was mostly due to a rise in incidence of PD, which remained the predominant modality of home dialysis, compared to home HD, which had remained essentially stable at 3.5%.

Prevalence of home dialysis, both PD and home HD has also increased in recent years, reflecting similar change

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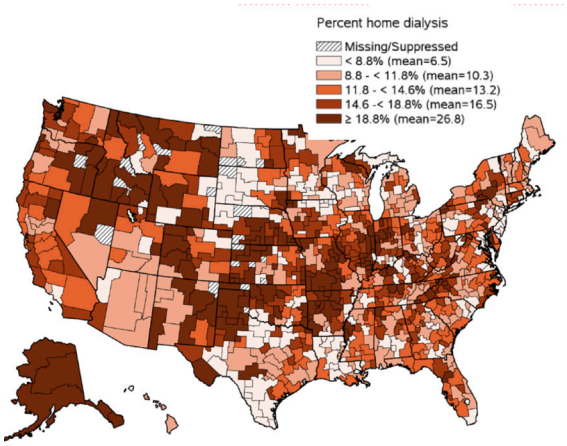

Figure 5. Geographic variations among prevalent patients on home dialysis in ESRD population 2011-2015
(United States Renal Data System. 2017 USRDS)

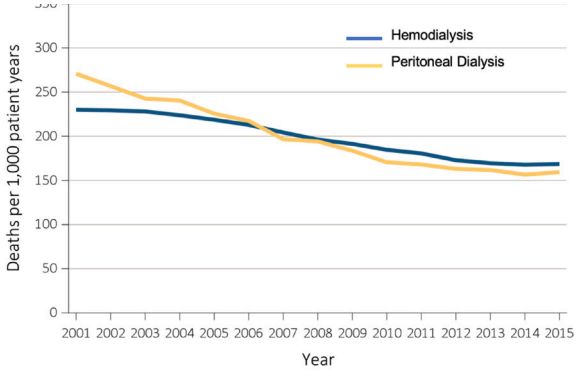

Figure 6. Change in mortality among Hemodialysis (HD) and Peritoneal Dialysis (PD) population between 2001-2015
(United States Renal Data System. 2017 USRDS)

in incident patient population (Figure 4). Prevalent

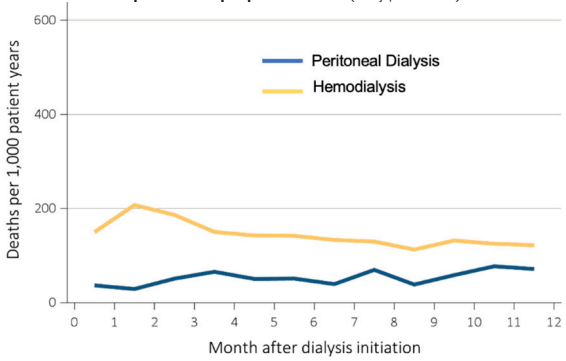

Figure 7. Adjusted Mortality during the first 12 months of dialysis among HD and PD patients younger than 65 in 2014
(United States Renal Data System. 2017 USRDS)

home HD rose by 8.6% in 2015, compared with an increase of 4.4% in 2008.

Geographic variations of prevalent home dialysis across the nation were important, going from 0% to 79% (Figure 5). Few geographic patterns were apparent, supporting the likelihood that differences in home dialysis use were largely driven by variations between

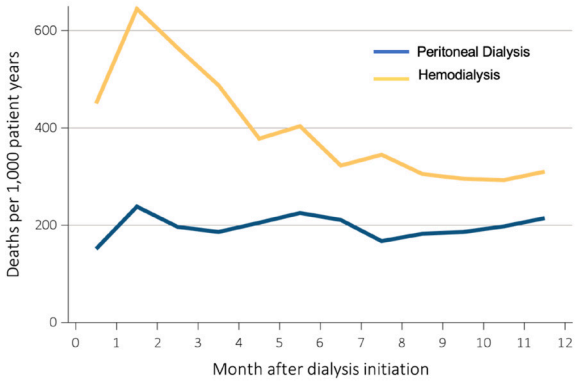

Figure 8. Adjusted Mortality during the first 12 months of dialysis among HD and PD patients older than 65 in 2014. Mortality was adjusted for age, gender, diagnosis and duration of dialysis.
(United States Renal Data System. 2017 USRDS)

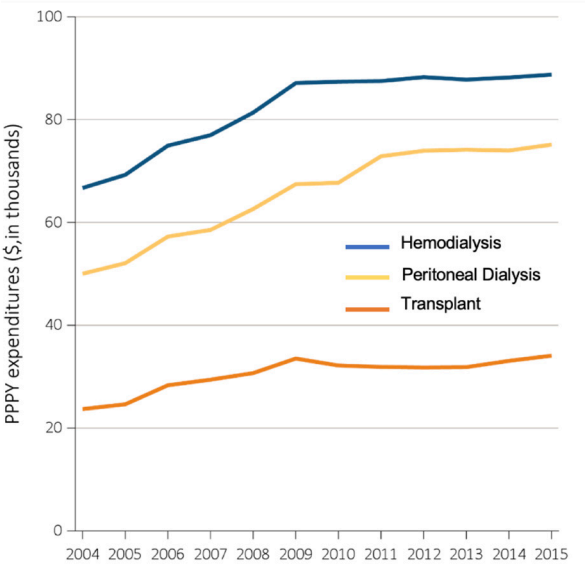

Figure 9. Total Medicare cost per patient per year by types of renal replacement therapies between 2004-2015
(United States Renal Data System. 2017 USRDS)

individual dialysis centers or groups of centers, rather than by large-scale regional effects.

MORTALITY

Mortality adjusted for age, gender, race, diagnosis and duration of dialysis has improved between 2001 and 2015. The degree of improvement in PD patients was higher than for incenter HD, reducing mortality in PD since 2007: in 2015, mortality rates were 159 per 1,000 patient-years for PD patients and 169 for HD patients (Figure 6)

Furthermore, mortality was also lower during the first year of PD compared with HD among group of patients younger than 65 (Figure 7). Difference between mortality rates of PD and HD was even higher for patients older than 65 (Figure 8)

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HEALTHCARE EXPENDITURES FOR PATIENTS WITH ESRD

Total Medicare (Federal government health insurance agency) costs per patient per year for PD were lower than for HD: 75 140 dollars for PD and 88 750 dollars for HD in 2015. (Figure 9)

DISCUSSION

Total Medicare costs for ESRD patients had doubled between 2004 and 2015, reaching 40 billion dollars in 2015 (Figure 10). However, this only represented 75% of total costs, the difference was covered by other sources of health insurance, including Medicaid and private insurances. Hence, dialysis costs have become favorite targets for politicians who have mandated that Medicare implement measures to reduce public health care costs and to ensure quality of care improvement (2,3).

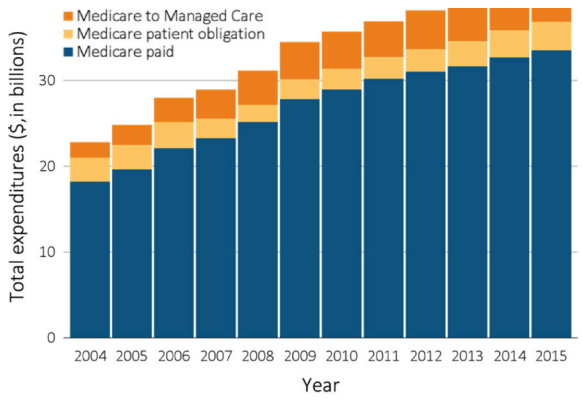

Figure 10. Progression in total annual Medicare cost for renal replacement therapies between 2004-2015
(United States Renal Data System. 2017 USRDS)

At present time, medical providers have little incentive to adhere to Medicare dual goals, since they are still reimbursed per medical act (fee-for-service). Poor patient care leads to higher level of medical services rendered and may enhance incomes of providers.

Medicare has recently launched a new pilot ESRD initiative, Seamless Care Organization (ESCO) (2), "which is a group of dialysis facilities, nephrologists and other health care providers working together to integrate care for dialysis patients. ESCOs are part of Medicare's Comprehensive ESRD Care Model and were created to measurably improve clinical outcomes and patient experience while reducing total cost of care. The model encourages dialysis providers to think beyond their traditional roles in care delivery and supports them as they provide patient-centered care that will address beneficiaries' health needs, both in and outside of the dialysis clinic". It is expected that if ESCO findings show improvement of patient care and lower costs, supporting Medicare's Comprehensive ESRD Care Model, Medicare may adopt 'Global Capitation' model of reimbursement, in which whole networks of dialysis providers, hospitals and physicians band together to receive single fixed monthly payments for enrolled health plan members to cover the total cost of medical care for plan members. The providers then must determine a method of dividing up the capitated check among themselves. As monthly payment is fixed, providers must assume financial risks, ie. higher cost of care will reduce providers' revenue. Sharing financial risks will fundamentally change approaches to medical practice, taking into account financial cost, improvement of quality of care and of mortality rates.

Under this future practice environment, selection of modalities of renal replacement therapy that can provide better care and lower cost will become crucial. USRDS data suggest that total Medicare health care expenditure per patient per year for PD were lower than for HD. Furthermore, PD patients have had lower mortality than HD patients. However, interpretation of USRDS data which are based on an observational study is limited by selection bias. Patients recruited into PD may be in better overall health, may be more emotionally independent, may have better social or familial support or may be under better and more dedicated medical supervision. Therefore, future randomized and prospective studies will be required to validate observational findings by USRDS that favored PD over HD.

However, despite USRDS observational data limitations, PD may still be a better incident modality of renal replacement under current catastrophic HD vascular access practice in the US: in 2015, 80% of all new HD patients initiated dialysis with a HD catheter (Figure 11). This predominant use of HD catheter has not changed

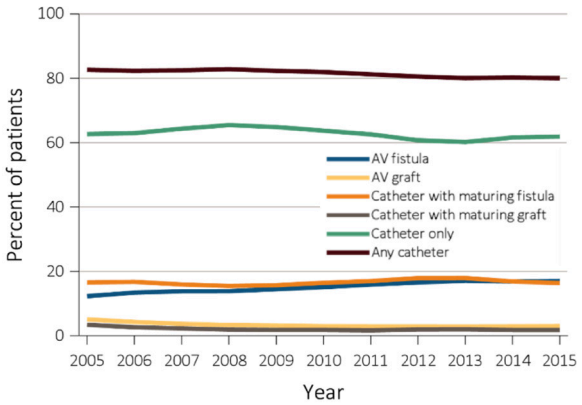

Figure 11. Types of Vascular Access among incident patients initiated on hemodialysis between 2005-2015
(United States Renal Data System. 2017 USRDS)

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since 2005, despite improvement in prevalent AV fistula use brought on by Fistula First Initiative.

The excessive use of incident HD catheter persists despite high risk of catheter sepsis compared to AV fistula or grafts. A Canadian study (4) showed higher relative risk of sepsis among patients dialyzed with a catheter during the first 6 months of dialysis, 8.49 (95% confidence interval 3.03–23.78) vs. 1.47 (95% confidence interval 0.36-5.96) in those dialyzed with an AV graft.
The Centers for Disease Control and Prevention reported 37 000 cases of sepsis among catheter patients in 2013, associated with a cost estimated at 23 000 dollars by hospitalization (5,6). Therefore, use of catheter can increase health care cost due to catheter associated infectious complications.

Furthermore, septic complications of catheters may account for higher mortality rate among HD patients compared with PD patients during the first year of dialysis (Figure 7,8). Interestingly, the observed gradual reduction of mortality rate in HD patients after the second month of dialysis may indicate a gradual conversion of HD catheters to either AV fistula or graft, while mortality among PD patients remained stable during the first year of dialysis and consistently below HD.

Therefore, strategies to reduce the incidence of HD catheters could significantly reduce cost and improve morbidity and mortality of dialysis in the US. Of note, geographic variations of incident HD patients with only a catheter without either an AV fistula or graft is very high, going from 50% to 100% (Figure 12). This geographic difference may reflect local medical practices. National efforts through Fistula First Initiative has failed to change providers medical practice since incident catheter use had not changed (Figure 11). Financial risks associated with HD catheter within Comprehensive ESRD Care Model may play a powerful financial incentive for providers to change practice behavior. Clearly, incident PD may be a better alternative option for incident patients without a functioning AV fistula.

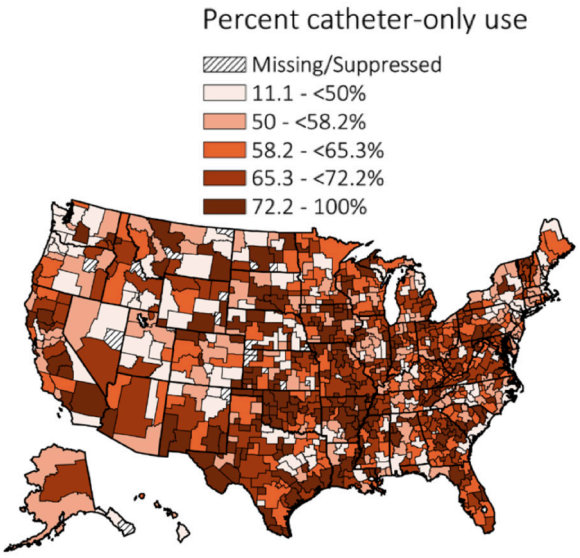

Figure 12. Geographic variations in percent of catheter-only use without AV fistula or AV graft at initiation of Hemodialysis in 2015 (United States Renal Data System. 2017 USRDS)

Furthermore, the U.S. Department of Health and Human Services (HHS) has recently announced new policy changes in ESRD, one of which promotes home dialysis by directly adjusting providers' reimbursement rates to the percent of home dialysis (3)

CONCLUSION

USRDS data have suggested that home dialysis, especially peritoneal dialysis may have potential advantages over in-center hemodialysis: lower cost of care and lower mortality rates.

Furthermore, despite the limitations related to the nature of USRDS observational data, PD may still be a better incident modality of renal replacement under current HD vascular access practice in the US with extremely high rate of incident HD catheter use. These HD catheters are associated with higher cost, morbidity and mortality due to higher septicemic risks.

Future randomized and prospective studies will be required to validate observational findings by USRDS that favored PD over incenter HD using either a HD catheter or an AV fistula.

Regardless, current changes in Federal government policy may ultimately lead to changes of providers practice and behavior with possible rise in the incidence and prevalence of home dialysis in the US in the future.
After Fistula First, the new national initiative should be PD First.

DISCLAIMERS

The author declares no conflict of interest

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