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Short Report

Management of diabetes patients during the year prior to initiation of dialysis in France

P. Tuppin^{a,*}, A. Cuerq^a, S. Torre^a, C. Couchoud^b, A. Fagot-Campagna^a

^a Caisse nationale de l'assurance maladie des travailleurs salariés, direction de la stratégie des études et des statistiques, 26-50, avenue du Professeur-André-Lemierre, 75986 Paris cedex 20, France

^b Registre REIN, Agence de la biomédecine, 1, avenue du stade de France, 93212 Saint-Denis La Plaine cedex, France

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Abstract

Aim. – This study looked at the management of diabetes patients during the year prior to the initiation of dialysis.

Methods. – For this observational study, data were extracted from the National Health Insurance database for general-scheme beneficiaries (77% of the French population). Diabetes patients were identified by at least three reimbursements for antidiabetic drugs in 2012, while the initiation of dialysis was identified by specific refunds in 2013.

Results. – Of the 6412 patients initiating dialysis, 37% ($n=2378$) had diabetes (men: 61%, median age: 71 years, haemodialysis: 92%). Six months prior to dialysis, 68% had filled at least one prescription for insulin, 38% for other antidiabetics (25% glinides, 8% sulphonylureas, 8% metformin, 6% DPP-4 inhibitors), 69% for three or more classes of antihypertensive drugs and 55% for erythropoiesis-stimulating agents. Within 12 months to 1 month of dialysis, 81% were hospitalized, 28% with a main diagnosis of kidney disease. No nephrologist referral or hospitalization was identified at 6–0 months before dialysis in 6% of patients or in 24% at 12–7 months. One in five patients with diabetes consulted a private endocrinologist within 6 months of dialysis. An arteriovenous fistula was created 1 month before haemodialysis in 43% of patients.

Conclusion. – The quality of preparation for dialysis was variable despite frequent hospitalizations. These data illustrate the need to mobilize patients with diabetes, and for healthcare professionals to more effectively anticipate and coordinate dialysis.

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Keywords: Diabetes; Dialysis; End-stage renal disease; Healthcare use; Observational study

1. Introduction

The prevalence of people treated for diabetes in France was estimated to be 5.3% in 2014, reflecting an annual growth of 2.9% from 2012. The estimated cost of management of patients with diabetes is €10 billions [1]. In 2013, the French end-stage renal disease (ESRD) replacement therapy registry, the Renal Epidemiology and Information Network (REIN), reported that 38% of dialysed patients had diabetes [2].

Early management of patients with chronic kidney disease (CKD) can avoid or delay initiation of renal replacement

therapy, limit emergency dialysis and improve survival with dialysis [3–7]. Specific guidelines for patients with diabetes were established by the National Health Authority (HAS) in France in 2012 and in Europe in 2015 [8,9]. Among other things, these guidelines emphasized the need for even earlier management of these patients over the course of CKD, and promoted the prescription of angiotensin-converting enzyme (ACE) inhibitors, lowering of the cut-off point for the indication of antihypertensive therapy during the earliest stages of CKD, and adjustment of the choice and doses of antidiabetic drugs, with limitation of catheter-based dialysis.

The objective of the present observational study was to describe the management of general-scheme health insurance patients with diabetes in the year preceding initiation of dialysis for ESRD in 2013.

* Corresponding author. Tel.: +33 1 72 60 25 26; fax: +33 1 72 60 17 26.
E-mail address: philippe.tuppin@cnamts.fr (P. Tuppin).

2. Patients and methods

The French National Health Insurance database (SNIIRAM) comprehensively and individually compiles all reimbursed prescriptions and procedures delivered on an outpatient basis or at private healthcare institutions [10], but includes no clinical information concerning results related to visits, prescriptions or examinations. Reimbursed drugs are identified by their Anatomical Therapeutic Classification (ATC) codes and medical procedures, whether delivered on an outpatient basis or at private healthcare institutions, and laboratory tests are identified by standard nomenclatures. However, laboratory tests performed in hospital are not included in the SNIIRAM database. All this information is linked to data collected in the public and private hospital-discharge database (PMSI), which also includes public hospital outpatient visits. Hospital stay diagnoses (main diagnosis [MD], related diagnosis [RD] and associated diagnosis [AD]) are coded according to the International Classification of Diseases, 10th revision (ICD-10).

The source population comprised National Health Insurance general-scheme beneficiaries, who constitute around 77% of the 66 million inhabitants of France. Adults initiating dialysis were identified by a first dialysis procedure in 2013 and the absence of dialysis over the previous year, and the absence of renal transplantation or follow-up for renal transplantation over the previous 4 years. People treated by dialysis for >45 days were considered as treated for ESRD. ICD code N18 was used to identify chronic renal failure, and ICD codes N00 to N18 were used to identify kidney disease. The type of dialysis was defined according to the modality of the first dialysis procedure used in 2013—peritoneal dialysis (PD) or haemodialysis—performed at a dialysis centre or elsewhere. Patients with diabetes were identified by at least three reimbursements for antidiabetic drugs in 2012.

For each time period under consideration, the use of a drug treatment, laboratory test, procedure or medical consultation was defined by at least one reimbursement, while hospitalizations were defined by at least one hospital stay. Referral to a nephrologist or other physician as well as laboratory tests may have been performed during hospitalization, but such information is not coded for in the PMSI. Therefore, our conservative hypothesis proposed that specialist referrals or specific laboratory tests were performed during hospital stays regardless of diagnosis (nephrologist, serum creatinine) or with a diagnosis of diabetes (diabetologist, blood glucose and HbA_{1c} assays).

SAS version 4.3 software was used for all statistical analyses (SAS Institute Inc., Cary, NC, USA).

3. Results

In 2013, 6412 general-scheme adult beneficiaries initiated renal replacement therapy by dialysis. Of these people, 2378 (37%) had diabetes (men: 60.7%, median age: 71 years) and 90% of them initiated dialysis at a haemodialysis centre (men: 60.5%, median age: 71 years), of whom 8% received PD (men: 61.1%, median age: 71 years).

No private or hospital nephrologist consultation (apart from hospital stays) was identified during the 6–0 months before dialysis for 25% of the newly dialysed diabetes patients or during the 12–7 months prior to dialysis for 42% of them (Table 1). Using the hypothesis that referral to a nephrologist took place during hospitalization, the lack of referral to a nephrologist was identified for only 6% of patients in the 6 months before dialysis and for 24% in the 12–7 months prior to dialysis. No outpatient or private diabetologist consultation was identified for around 80% of patients within a year of starting dialysis.

In addition, no serum creatinine assay was performed in a private laboratory for 8% of the newly dialysed patients within 6–0 months or for 16% within 12–7 months of dialysis. However, after taking into account all hospitalizations regardless of diagnosis, these percentages decreased to 3% and 11%, respectively. During the 6 months before initiation of dialysis, no microalbuminuria or urinary protein assay was performed at a private laboratory in 50% of patients, no urinary creatinine was done in 67% and no HbA_{1c} assay was carried out in 22%. On taking into account only hospitalizations with a diagnosis of diabetes, the absence of HbA_{1c} assay decreased to 8%.

In the 6 months preceding initiation of dialysis, an antidiabetic treatment was refunded at least once to nearly 90% of those with diabetes: for insulin in two-thirds of cases; and for oral antidiabetic drugs in 38% of cases—mostly glinides (25%), but also sulphonylureas (8%) and metformin (8%). A very slight increase in the use of insulin was observed between 12–7 months and 6–0 months (from 65 to 68%) before dialysis, whereas the use of metformin (from 13 to 8%) and sulphonylureas (from 12 to 8%) decreased, and the use of glinides remained stable (from 24 to 25%). At least one antihypertensive treatment in the 6 months prior to initiation of dialysis was identified for 97% of patients, involving calcium-channel blockers (76%), renin-angiotensin system (RAS) inhibitors (71%) and diuretics (69%).

Overall, 81% of patients with diabetes were hospitalized at least once, regardless of diagnosis, within 12 months to 1 month of dialysis (Table S1; see supplementary materials associated with this article online). In 73% of cases, a diagnosis of kidney disease was made during the hospital stay and, in 28% of cases, this was the MD. Specific catheter placement in the year preceding PD was identified in 90% of patients, while the creation of an arteriovenous fistula (AVF) at 24 months to 1 month before dialysis was identified in 43% of those treated at a haemodialysis centre.

4. Discussion

The present study reveals a rather large percentage (37%) of diabetes among those initiating dialysis; indeed, the national REIN dialysis registry expects regular growth in the incidence of ESRD in France, essentially related to progression of diabetic nephropathy [11]. Guidelines recommend follow-up by a nephrologist from stage-3B CKD. Yet, in our study, no hospital or private nephrologist referral was identified for 42% of patients with diabetes at 12 to 7 months or for 25% of those with diabetes at 6 months before initiation of dialysis, although these figures were markedly decreased to 24% and 6%, respectively,

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