



## The etiologies of renal failure in diabetics at the C.H.U in Brazzaville

R. LOUMINGOU\*, G. MAHOUNGOU

Service de Néphrologie C.H.U de Brazzaville

---

### ABSTRACT

*INTRODUCTION : Diabetic nephropathy is the leading cause of kidney failure in diabetics. The aim of this work is to list the other etiologies of renal failure in diabetics to optimize overall care. Patients and methods: Retrospective study from January 1<sup>st</sup> to December 31<sup>st</sup> 2016 at the university and hospital center of Brazzaville. Records of patients hospitalized in the nephrology department of the university and hospital center of Brazzaville were collected. Results: 237 out of 346 hospitalized patients 68,49% had renal insufficiency 101 of 237 patients with renal insufficiency 43% were diabetic. The main etiologies of renal failure were: Diabetic nephropathy 42% of cases, followed by nephroangiosclerosis 20% of cases and VIH nephropaty 10% Conclusion :Diabetic nephropathy is the leading cause of kidney failure in diabetics. Other etiologies must be sought to optimize overall case.*

**Keywords :** etiologies, renal insufficiency, diabetes.

---

### INTRODUCTION

Kidney failure (RI) is a real public health problem with diabetes mellitus (1). The number of new patients reaching terminal RI due to diabetes has been increasing for 30 years (2). Diabetes became the leading cause of chronic terminal RI in 44% of incident patients in the United States in 2008 (3), 34% in New Zealand in 2008 (4) 11 to 35% depending on the country in Europe in 2004 (5) and 22% in 2008 in France (6). Diabetic nephropathy is the leading cause of RI in diabetics. The occurrence of IR in a diabetic patient, however, requires careful etiological research to detect these potentially curable causes of IR.

We report a hospital series of RI observations in diabetic patients in order to identify the etiologies in our environment for global management.

### MATERIALS AND METHOD

Retrospective study from January 1, 2016 to January 31, 2016 at the C.H.U in Brazzaville. The files of patients hospitalized in the nephrology service of the C.H.U of Brazzaville were collected.

The parameters studied were; age, sex, known course of diabetes, serum creatinine, serum creatinine clearance estimated using the modification of diet in renal diseases (MDRD) formula (7).

We defined RI according to the criteria of the national agency for health accreditation and

evaluation (ANAES) (8); glomerular filtration rate (GFR) less than 60 ml / min / 1.73m<sup>2</sup> of body surface.

The IR stage classification for serum creatinine clearance is that of: the American Diabetes Association (ADA) (9).

RI was moderate if GFR between 30 and 59 ml / min

Severe IR if GFR between 15 and 29 ml / min

Terminal IR if GFR lower than 15ml / min

RI was considered to be acute if the deterioration in renal function was sudden, reversible or had progressed for less than 3 months

RI was chronic if it had progressed for more than 3 months, or if the deterioration in kidney function was irreversible.

The diagnosis of diabetic nephropathy was retained before a microalbuminuria considered positive if the rate was between 30 and 300mg / 24h, or before a positive proteinuria with a rate higher than 300mg / 24h associated with diabetic retinopathy documented at the back of the eye a history of treatment with panphoto coagulationretinienne by laser.

The diagnosis of nephroangiosclerosis was made in the face of renal failure in the context of old hypertension, associated with hypertensive retinopathy at the back of the eye, electrical signs suggestive of the electro cardiogram.

## RESULTS AND DISCUSSION

346 patients were hospitalized in the nephrology department during the study period.

237 patients or 68.49% had renal insufficiency.

22 patients or 9.28% had an ARI.

215 patients or 90.71% had a CKD.

101 patients with renal impairment (43%) were diabetic.

89 diabetic patients had a CRI 88%

12 patients had CRI 12%

By gender: 61 men, 40 women

Sex ratio: M / F 1.5

The average age of diabetic kidney patients was  $55.9 \pm 10.4$  years

The average known duration of progression of diabetes was  $12.14 \pm 2$  years

Extreme: 1-23 years

The main etiologies of RI in diabetic patients were:

- Diabetic nephropathy 42%
- Nephroangiosclerosis 20%

- HIV nephropathy 10%
- Acute post infectious nephritis glomerulo 4%
- Acute pyelonephritis 4%
- Glomerulonephrite chronique 4%
- Toxic nephropathies 4%
- Chronic interstitielle nephropathies 4%
- Obstructive kidney disease 3%
- Hyperuricemic nephropathies 1%
- Nephropathies of undetermined causes 4%

#### Discussion

The exact prevalence of RI is difficult to establish. Patients with diabetic renal failure hospitalized in the metabolic diseases department are not taken into account. Not all patients with AKI are hospitalized in the nephrology department.

Diabetic nephropathy was the number one cause of RI in our study. JUNGER *et al* in France (10) BOUZID *et al* in Tunisia (11) also reported diabetic nephropathy as the leading cause of chronic terminal RI. This is not the case in the African literature consulted (12; 13) for which hypertension and chronic glomerulo nephritis are the primary causes. The exact distinction between diabetic nephropathy and nephroangiosclerosis is not easy to establish due to the frequent association of diabetes and hypertension especially in type II diabetics (14; 15).

The discriminating nature can be brought by the known duration of development of diabetes, and the associated diabetic or hypertensive retinopathy.

In the absence of renal histology the diagnosis of diabetic nephropathy is presumptive, the term of diabetic renal disease is currently proposed by the working group of the national kidney foundation of kidney diseases (16).

HIV nephropathy is the third leading cause of chronic terminal RI in African American patients aged 20 to 64 (17). In our study, 10% of diabetic patients with kidney disease are infected with HIV. Kidney damage is poly factorial; linked to the toxicity of antiretrovirals (18), directly induced by HIV (19) and by comorbidities linked to HIV.

Kidney failure secondary to acute post-infectious glomerulonephritis was related to skin infections; erysipelas and superinfection of diabetic foot.

The diagnosis of chronic glomerulonephritis was evoked mainly on clinical, biological and evolutionary criteria in the absence of renal histology. The criteria retained were the notion of persistent and old glomerular proteinuria associated with hematuria which is conventionally absent in diabetic nephropathy (20).

The IR secondary to toxic and toxic nephropathies were totally or partially resolved when the poisoning was stopped.

The drugs involved in our study were; diuretics, anti-inflammatories, ACE inhibitors, and iodine-

based contrast media.

The pathologies associated with diabetes and the advanced age of type II diabetics explain the frequent use of these drugs (21).

Chronic tubular interstitial nephropathies have been mentioned in diabetic patients with CKD with reduced kidneys, irregular contours on ultrasound associated with the concept of repeated urinary tract infections and probably reflux phenomena on diabetic neurogenic bladders. (22).

Obstructive nephropathies were essentially prostatic barriers in elderly diabetics.

The hypothesis of hyperuricemic nephropathy was raised in a patient with a history of gout evolving for 15 years, an old hyperuricemia treated with allopurinol, a diabetes of recent discovery without diabetic retinopathy, nor hypertensive. This etiology is probably underestimated due to the frequent association of metabolic syndrome and hyperuricemia in type II diabetics (23).

The not insignificant frequency of RIs of undetermined cause is linked to the limited means of investigation and the late recourse to the nephrologist (24).

### CONCLUSION:

The main diabetic nephropathy causing RI in diabetics should not be systematically discussed in front of any RI. Other etiologies should be carefully researched to optimize recovery of kidney function and delay or prevent the installation of active IR.

### REFERENCE

- [1] Halimi JM et al Rein et diabète Rev Med interne **2004** : 25
- [2] Ritz'E, RychlikI, Locatelli F, Halimi S End-stage renal failure in type 2 diabetes: a medical catastrophe of worldwide dimensions Am J kidney Dis **1999** : 34 : 795 – 808
- [3] Middleton RJ, et al The unrecognized prevalence of chronic kidney disease in diabetes Nephrol Dial Transplant **2006**;21 : 88 – 92
- [4] Villar E, Zaoui P Diabète et maladie rénale chronique: ce que nous apprend l'épidémiologie NéphrolTher **2010** ; 6 (7) : 585 – 90
- [5] Van Dijk PC, Jager KJ, Stengel B, Gronhagen – Riska C, Feest TG, Briggs JD, renal replacement therapy for diabetic end stage renal disease : data from 10 registries in Europe (1991 – 2000) Kidney int **2005**; 67 : 1489 – 999
- [6] Couchoud C, Villar E, Frimat L, Fagot – Campagna A, Stengel B l'insuffisance rénale chronique terminale associée à un diabète : fréquence et conditions d'initiation du traitement de suppléance. France 2006, Bull épidémiolHebd **2008**.
- [7] Levey AS, Coresh J, Greene T, Stevens LA, Zhang VL, Hendriksen et al using standardized serum créatinine values in the modification of diet in renal disease equation for estimating glomerular filtration rate. Ann intern Med **2006** ; 145 : 247 – 54
- [8] Anaes. Diagnostic de l'insuffisance rénale chronique chez l'adulte ; 2009 American diabetes association. Standard of medical care in Diabetes. Diabetes care **2009** ;32 (suppl 1) : S28
- [9] Jungers P, Robino C, Choukroun G, Evolution de l'insuffisance rénale chronique et prévision des besoins en dialyse de suppléance en France Néphrologie **2001** ; 22 : 91

- 
- [10] Bouzid C, Smida H, Kacem A, Turki Z, Bensalem L, Benrayana C, Benslama C l'insuffisance rénale chez les diabétiques de type 2 tunisiens hospitalisés : Fréquence et facteurs associés la Tunisie Médicale **2011** ; vol 89 (n°1) : 10-15
- [11] Diallo AD, Niamkey E, Beda Yao B, l'insuffisance rénale chronique en Côte – d'Ivoire étude de 800 cas Santé Publique.
- [12] Olutayo Alebiosu C, Odusami O, Jaiyesimi A, Morbidity in relation to stage of diabetic nephropathy in type 2 diabetic patients. Journal of the national medical association **2003**; 95 n°11.
- [13] Ford ES, Giles WH, Mokdad AH, increasing prevalence of the metabolic syndrome among US adults diabetes care **2004**; 27 : 2444 – 2449
- [14] Doucet J, Druet L, Capet C et al Risk factors and management of diabetes in elderly French patients Diabetes Metab **2008** ; 34 (6) : 574 – 80
- [15] National kidney foundation KDOQI clinical practice guidelines and clinical practice recommendations for diabetes and chronic kidney disease Am J Kidney Dis **2007** ; 49 : 51 – 80
- [16] UNITED STATES renal data system (URSDS) annual stage renal disease incidence and prevalence **2007**.
- [17] Izzedine H, Launay – Vacher, Deray G antiviral drug – induced nephrotoxicity Am J Kidney Dis **2005** ; 45 : 804 – 817
- [18] Leslie A, Bruggeman, PJ Nelson Controversies in the pathogenesis of HIV associated renal diseases Nature Reviews Nephrology Vol 5, October **2009**, 579 –2009
- [19] Hommel E, Carstensen H, Skot P et al Prevalence and cause of microscopic haematuria in type I diabetic patients with persistent proteinuria **Diabetologia** **1987** ; 30 : 627 – 630
- [20] Charpentier G, Riveline JP, Varroul – Vial M Management of drugs affecting blood glucose in diabetic patients with renal failure Diabetes Metab **2000** : 26 (S4) : 73 – 85
- [21] Dracon M, Lemaitre L, Infections urinaires de l'adulte Leucocyturie. Rev Prat **2003** ; 53 : 1137 – 42
- [22] Kramer HJ, Choi HK, Atkinson K, Stampfer M, Curhan GC ; The association between gout and nephrolithiasis in men : The health professional's follow – up study kidney int, **2003** ; 64 : 1022 – 1026
- [23] Frimat L, Loos – Ayav C, Panescu V, Cordebar N, Briancon S, Kessler M, Early referral to a nephrologist is associated with better outcomes in type 2 diabetes patients with end-stage renal disease. Diabetes Metab **2004** : 30 : 67 – 74