

Management of Obstructive Renal Failure in Adults at the Sylvanus Olympio University Hospital

Yawovi Mawufemo Tsevi¹, Edoé Viyomé Sewa², Abago Balaka³, Ablavi Adani-Ifè³, Eyram Yoan Amekoudi¹, Komi Daniel Dokouvi¹

¹Department of Nephrology and Hemodialysis, Sylvanus Olympio Hospital, Lomé, Togo

²Department of Urology, Sylvanus Olympio Hospital, Lomé, Togo

³Department of Internal Medicine, Sylvanus Olympio Hospital, Lomé, Togo

Email: tseviclaude@gmail.com

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Abstract

Background: Obstructive nephropathies are a topical issue in urology and nephrology consultations, but no study has yet been conducted on the subject in our country. **Objective:** Describe the epidemiological, clinical, therapeutic and evolutionary profile of obstructive nephropathies at the Sylvanus Olympio University hospital of Togo. **Method:** It was a descriptive and cross-sectional study with a collection of retrospective data over a period of 08 years (2012-2019) which focused on obstructive nephropathies in the Urology-Andrology, Nephrology and Internal Medicine departments at the medical clinic of CHU SO. The diagnosis of obstructive nephropathy is retained on the basis of radiological and medical imaging results. **Results:** The study population included 131 patients. The annual hospital frequency was 2.84 cases for 100 admissions. The mean age was 56.72 ± 17.76 years. These patients were mostly male (72.52%). The most frequent age group was 60 - 80 years. Common symptoms at presentation were loin pain (45.75%) and dysuria (25.95%). The average length of probable course of the disease before hospitalization was 636.94 ± 258.88 days (21 months). The etiologies of obstructive nephropathy were largely dominated by prostatic tumors in half of the cases (45.80%). Among these patients, 121 have presented renal failure (92.36%). The average serum creatinine at admission was 59.01 ± 21.56 mg/l. Of the 121 patients with obstructive nephropathy presenting renal failure, 54 (44.63%) had decreased their serum creatinine at the output of more than 25%. The open surgery (54.20%) was the main treatment. There was an improvement in kidney function in patients who had a shorter duration of disease progression and who did not have a history of loin pain, oliguria and that the etiologies of the disease were not tumors. Tumoral etiologies, the presence of a history of

high blood pressure, oedema of the lower members, oliguria, and a longer duration of disease progression and sex were factors associated with the occurrence of end-stage renal disease. **Conclusion:** Renal failure is the main complication of obstructive nephropathy in Togo, hence the importance of an early diagnosis for better care.

Keywords

Obstructive Nephropathy, Renal Failure, Etiologies, Lomé (Togo)

1. Introduction

Obstructive renal failure reflects the functional and organic deterioration of the kidneys, linked to an obstruction to the normal flow of urine in the excretory tract. It results from obstructive nephropathy, which may be acute or chronic, progressively leading to interstitial fibrosis and tubular atrophy [1] [2]. In Ivory Coast, the prevalence is 9% in the population of elderly subjects with chronic kidney failure [3]. The symptoms are non-specific and the causes are multiple, dominated by pelvic tumors in adults and congenital malformations in children [4]. Early diagnosis and drainage of the urinary tract are necessary to prevent the progression of chronic renal failure, the treatment being surgical first before nephrological [5]. In our country, obstructive nephropathies are a topical issue in uro-nephrology consultations, but no study has yet been conducted on the subject. The objective of our study was to describe the epidemiological, clinical, therapeutic and evolutionary profile of obstructive renal failure in the hospital population of the Sylvanus Olympio University Hospital in Togo.

2. Patients and Methods

Our study took place in the Nephrology, Urology, and Internal Medicine services of the Sylvanus Olympio University Hospital of Lomé. It was a descriptive cross-sectional study with retrospective data collection covering the period from January 1, 2012 to December 31, 2019 (8 years). The included patients were admitted in the aforementioned services for impaired renal function and obstruction of urinary excretory tract on imaging. Patients with renal failure without urinary tract obstruction were not included in our study. The parameters studied were socio-demographic characteristics (age, sex, socio-economic level), antecedents, reason for admission, imaging data, condition involved, treatments carried out and evolution. Renal function was assessed by calculating creatinine clearance according to the simplified MDRD and impaired renal function was considered to be creatinine clearance of less than 90 ml/min. End-stage renal disease corresponded to a creatinine clearance of less than 15 ml/min. The rate of reduction of blood creatinine, defined as the ratio of output to input creatinine multiplied by 100, was determined to evaluate the effect of treatment on the evolution of renal function. Thus, a reduction of more than 25% of the output creatinine

compared to that of the input was considered favorable.

The data thus collected was recorded in the statistical software SPSS and their processing were realized by using the statistical software STATA version 16. The results were expressed as mean \pm standard deviation for quantitative data and as percentage (%) for the qualitative data. In order to highlight the possible existence of dependence between the variables, we used the Khi-2 test with a significance level of p less than or equal to 0.05.

The confidentiality of the data was ensured by reserved access to the files and by the respect of anonymity in the publication of the results.

3. Results

We recorded a total of 121 cases of obstructive renal failure out of 4619 admissions. This represented an annual hospital frequency of 2.62%. It was respectively 5.08%, 2.32% and 0.71% in the departments of Urology, Nephrology and Internal Medicine. The average age of the patients was 56.72 ± 17.76 years with extremes of 16 and 99 years. The most represented age group was that of 60 - 80 years (**Figure 1**). The sample was made up of 90 men (74.38%) and 31 women (21.62%), a sex ratio of 2.9. The main reasons for admission were lumbar pain and dysuria representing 45.75% and 25.95% respectively, as shown in **Table 1**. Hematuria was found as an antecedent in 23.7% of patients, and high blood pressure (30.58%) was the main antecedent of systemic illness (**Table 2**). The mean duration of symptoms evolution was 636.94 ± 258.88 days (21 months); 49.60% of the patients had a median duration of disease evolution of more than 3 months. The clinical examination data are recorded in **Table 3**. Biologically, the mean creatinine on admission was 59.01 ± 21.56 mg/L and the mean blood urea level was 1.04 ± 1.01 g/l. Anemia was present in 43 patients (35.53%), with a mean hemoglobin level of 9.8 ± 8.10 g/dl.

Regarding imaging exploration, abdomino-pelvic ultrasound was performed in all patients. It had made it possible to demonstrate a dilation of the pyelo-caliceal cavities (**Table 4**). Thirty-four (34) patients, (28.09%), had performed

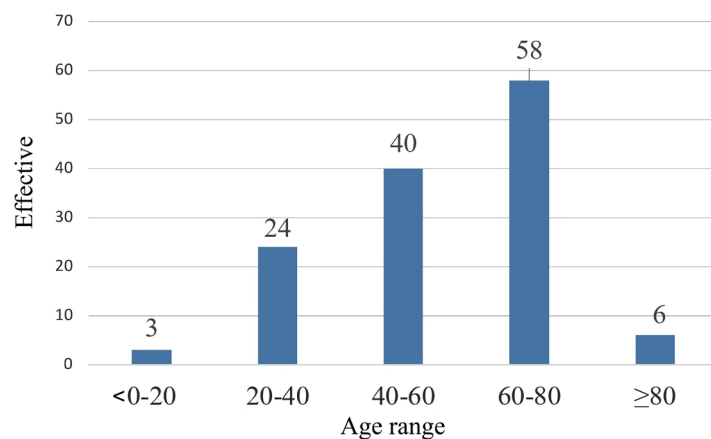


Figure 1. Distribution of patients by age group.

Table 1. Reasons for admission.

	Effective	Percentage
Lower back pain	56	45.75
Dysuria	34	25.95
Oliguria	29	22.13
Edema of the lower limbs	28	21.37
Hematuria	11	8.40
Anuria	7	5.34

Table 2. Distribution of patients according to antecedents.

	Effective	Percentage
<i>Urological (n = 52)</i>		
Hematuria	29	23.7
Acute urine retention	15	12.39
Renal colic	6	4.95
Urogenital bilharziasis	2	1.65
<i>Nephrology (n = 20)</i>		
Edema of the lower limbs	19	15.70
Renal failure	1	0.82
<i>General illness (n = 44)</i>		
Arterial hypertension	37	30.58
Diabetes	7	5.78

Table 3. Clinical examination data.

	Effective	Percentage
Alteration of general condition	89	73.55
Pelvic shield	69	57.02
Chronic urine retention	18	14.87
Lumbar mass	2	1.53

Table 4. Distribution of patients according to ultrasound results.

	Effective	Percentage
Dilation of pyelocal cavities	121	100
Prostatic hypertrophy	38	31.4
Urinary lithiasis	18	14.87
Intravesical budding tumor	11	9.09
Uterine fibroid	3	2.48
Ovarian mass	1	0.82

an abdomino-pelvic scan to objectify a dilation of the pyelo-caliceal cavities in all 34 (100%) patients. A biopsy was performed in 56 patients (46.28%). The etiologies of obstructive nephropathies were dominated by prostatic tumors which

represented 48.76%. The main tumor etiology was prostate cancer 34 (28.1%). The other causes are shown in **Table 5**. First-line urine drainage was performed in 45 patients. Urethrovessical catheterization was the most frequent drainage method, in 51.11% (**Table 6**). No endoscopic gesture of ureteral stent grafting had been performed. Surgery was performed in the management of obstructive nephropathies in 83 patients, (68.59%) of cases. The surgical procedures are recorded in **Table 7**. Dialysis was performed in 15 patients, (12.39%) and no patient underwent radiotherapy (**Table 8**). An improvement in renal function was noted in patients with a shorter duration of disease progression ($p = 0.03$) and who did not have an uro-nephrological antecedent (lumbar pain $p = 0.01$; oliguria $p = 0.01$), and that the causes of obstructive nephropathy were not tumoral ($p = 0.01$) (**Table 9**). End-stage renal disease occurred in 40 patients (30.53%). Factors associated with the occurrence of this end-stage renal failure were tumor causes ($p = 0.02$), the presence of an antecedent of oliguria ($p = 0.01$) and arterial hypertension ($p = 0.03$), a duration of progression of more than 3 months ($p = 0.04$) and gender male ($p = 0.03$) (**Table 10**).

Table 5. Distribution of patients according to cause.

	Effective	Percentage
<i>Tumor causes</i>		
• Malignant		
Prostate cancer	34	28.1
Bladder cancer	14	11.57
Cervical cancer	9	7.42
Lymphoma	3	2.48
Adenocarcinoma of the rectum	1	0.82
• Benign		
Prostate adenoma	25	20.66
Uterine fibroid	3	2.48
<i>Non-tumor causes</i>		
Urinary lithiasis	24	19.83
Urethral stricture	3	2.48
Pyelo-ureteral junction syndrome	2	1.65
Stenosis of the ureterovesical junction	2	1.65
Retroperitoneal fibrosis	1	0.82
Total	121	100

Table 6. Urinary drainage mode.

	Effective	Percentage
Urethrovessical survey	23	51.11
Suprapubic cystostomy	13	28.89
Percutaneous nephrostomy	9	20
Total	45	100

Table 7. Distribution of patients by surgical procedure.

	Effective	Percentage
Prostatic adenomectomy	25	30.12
Pyelo/ureterolithotomy	24	28.92
Bilateral testicular pulpectomy	20	24.09
Total cystoprostatectomy	4	4.8
Urethroplasty	3	3.61
Hysterectomy	2	2.4
Pyeloplasty	2	2.4
Utero-vesical reimplantation	2	2.4
Hysterectomy	1	0.83
Total	83	100

Table 8. Distribution of patients according to treatments performed.

	Effective	Percentage
Dialysis	15	12.39
Medicated hormone therapy	14	11.57
Chemotherapy	13	10.74
Therapeutic abstention/symptomatic treatment	7	5.78
Corticosteroid therapy	1	0.82

Table 9. Comparative characteristics of patients with renal failure depending on whether or not they experienced a decrease in their output creatinine.

	Decrease < 25% (n = 67)	Decrease > 25% (n = 54)	P
Male gender	49 (73.13)	36 (66.67)	0.48
Median age > 60 years	27 (40.30)	27 (50)	0.26
Antecedent of high blood pressure	12 (17.91)	12 (22.23)	0.06
<i>Urological antecedents</i>			
Hematuria	10 (14.92)	09 (16.67)	0.69
Lower back pain	19 (28.36)	03 (5.56)	0.01
Renal colic	5 (7.46)	01 (1.49)	0.56
Acute urine retention	5 (7.46)	02 (3.70)	0.89
Dysuria	16 (23.88)	21 (38.89)	0.07
Pollakiuria	09 (13.43)	15 (27.78)	0.06
<i>Nephrological antecedents</i>			
Oliguria	2 (2.98)	9 (16.67)	0.01
Evolution of nephropathy > 3 months	48 (71.64)	21 (38.89)	0.03
<i>Tumor cause</i>	41 (61.20)	17 (31.48)	0.01

Table 10. Factors of occurrence of End-Stage Renal Disease (ESRD).

	ESRD (n = 40)	Lack of ESRD (n = 91)	p
Male gender	24 (60)	71 (78.02)	0.03
Median age > 60 years	21 (52.50)	43 (47.25)	0.58
Antecedent of high blood pressure	16 (40)	26 (28.57)	0.03
<i>Urological antecedents</i>			
Hematuria	08 (20)	21 (23.07)	0.69
Lower back pain	09 (22.50)	23 (25.27)	0.73
Renal colic	01 (2.50)	05 (5.49)	0.45
Acute urine retention	06 (15)	09 (9.89)	0.39
Dysuria	17 (42.50)	30 (32.96)	0.29
Pollakiuria	11 (27.50)	23 (25.27)	0.78
<i>Nephrological history</i>			
Oliguria	07 (17.50)	04 (7.69)	0.01
Edema of the lower limbs	14 (35)	07 (7.69)	0.01
Evolution of nephropathy > 3 months	24 (60)	18 (19.78)	0.04
<i>Tumor cause</i>			
	22 (55)	16 (17.58)	0.02

4. Discussion

The limits of our study lie not only in the difficulty of finding certain files, but also of finding incomplete files with sometimes certain examinations were not realized because of financial difficulties. In fact, the minimum interprofessional growth wage is 35,000 FCFA (52 €), only insured patients manage to honor all the examinations requested.

The occurrence of renal failure may be of urological or nephrological cause. The annual hospital frequency in the urology department is higher than that of the nephrology department. Indeed, most of our patients have presented urological antecedent of dysuria and pollakiuria, which makes them consult at urology service. It's only for the presence of renal failure that they are sometimes referred to the nephrology department for medical treatment. Male subjects were more affected: this male predominance was confirmed by studies carried out in Côte d'Ivoire by Lagou *et al.* [5], and in India by Dilip *et al.* [4]. This is justified by the fact that urinary tract obstructions are predominantly dominated by male causes in particular prostatic diseases in adults. Indeed, the average age of our patients was 56.72 ± 17.76 years and the 60 - 80 years' age group was the most represented. Similar results have been reported in Africa and more particularly in Cameroon by Halle *et al.* [6] who found an average age of 50 years.

The mean duration of the disease evolution in our study was 636.94 ± 258.88 days (21 months). This duration of development is less than that reported by Lagou *et al.* [5] who found an average duration of evolution of the pathology before hospitalization which was 103.32 months with a median duration of evo-

lution of 55.20 months. This average duration of evolution found in our study is upper than that reported by Natchagande *et al.* [7] where the duration of evolution of the disease was 10 months. All these studies show a delay in consultation, which can be related to the low socio-economic level of the patients, the lack of information and the absence of universal health coverage.

The symptomatology of obstructive nephropathies varies depending on the site, severity and speed of onset of the obstruction. Pain is common when acute obstruction distends the excretory tract or the renal capsule. In our work, lower back pain was the most frequent sign on admission, 45.95% followed by dysuria (25.95%). Similar results were observed by Dilip *et al.* [4] where lumbar pain represented 64.74% of the signs on admission. These results contrast with those of Halle *et al.* [6] where asthenia was the main symptom present on admission and with those of Natchagande *et al.* [7] where voiding disorders were the main signs of obstructive nephropathies. This difference can be explained by the clinical variability of obstructive nephropathies and the stage of the disease progression in patients seen.

Biologically, the mean creatinine on admission in our patients was 59.01 ± 21.56 mg/L. The blood creatinine level is indeed the indicator of the functional state of the kidneys. Its rise, associated with a decrease in hemoglobin levels, reflects the importance of kidney damage. Our results overlap with those of Lagou *et al.* [5] and Halle *et al.* [6] who respectively reported an average hemoglobin rate of 8.33 ± 2.67 g/dl and 8.40 ± 2.40 g/dl. The chronic obstruction stage in which patients are seen is often associated with chronic kidney failure which is responsible for anemia in some patients.

In our study, all patients underwent abdomino-pelvic ultrasound which made it possible to note a pyelocaliceal dilatation. Radiological exploration of obstructive uropathy is an essential step in their management. Ultrasound remains the examination of choice to confirm the diagnosis of obstructive nephropathy by demonstrating dilation of the pyelocaliceal cavities, it also allowed to analyze the size of the kidney, to measure the thickness of the renal parenchyma (cortical index), to visualize a lithiasis (posterior shadow cone), to appreciate the retro-peritoneal organs, and look for a possible pelvic tumor (bladder, prostate) thus, it help to establish the etiological diagnosis [8]. It is most often completed by a scanner, which makes it possible to find the exact nature of the obstruction and a complete and finer exploration of the urinary tree. This is how it was achieved in 25.95% of our patients.

The etiologies of obstructive nephropathies were largely dominated by prostatic tumors. The main tumor etiology was prostate cancer in 28.1% of patients. Our results are similar to those of Lagou *et al.* [5] where prostatic tumors were the leading etiology. Other authors, notably Coulibaly *et al.* [9], Muhammad *et al.* [10] in Nigeria found cervical cancer and bladder cancer respectively as the primary cause of obstructive nephropathies. Most patients are admitted to the Internal Medicine department at very advanced stages of the disease, with dete-

rioration of the general condition, where pelvic invasion is frequent resulting in obstructive nephropathies.

In terms of management, drainage of the urinary tract was initially performed in 45 patients and consisted of urethrovesical catheterization in 51.11% of cases. For Coulibaly *et al.* series [9], percutaneous nephrostomy was the most performed. Indeed, these gestures allow a decompression of the renal cavities and thus a relative improvement of the renal function while awaiting a definitive treatment. They thus allow to appreciate the efficiency of a clearing gesture of the renal function.

Treatment of the etiology of the obstruction was surgical in 68.59% of patients. It's indeed the first-line treatment to permanently unblock the urinary tract once the diagnosis of nephropathy has been established. Nephrological management only intervenes in the event of need for dialysis to supervise the decompression surgery or in the event of no improvement of renal function after surgery. No patient had undergone radiotherapy or endoscopic treatment, the technical platform relating to these types of treatment does not exist in our care structure.

There was a statistically significant difference between improvement in renal function and the absence of antecedents of lower back pain, oliguria, non-tumor causes, and a median disease course of less than 3 months. Lagou *et al.* [5] found the absence of diuresis disturbances on admission, non-tumor causes and a shorter duration of disease evolution as factors associated with improvement in renal function. The evolution can also be done towards end-stage renal failure, as was the case in 40 patients in our series: a benign cause does not formally mean a favorable evolution of the nephropathy. Early markers of irreversible lesions were thus determined. Morozov *et al.* [11] in Russia, showed that in 167 children with congenital uropathies, the values of CRP in serum, IL6 and IL8 in urine were correlated with the severity of the inflammation of the urinary tract and the development of chronic obstructive nephropathy regardless of the level of obstruction. Xie *et al.* [12] in China have showed that urinary markers including NGAL (Neutrophil Gelatinase associated Lipocalin), uKIM-1 (Urinary Kidney Injury Molecule-1) and ul-FABP (Liver type Fatty Acid Binding Protein) are positively correlated with the level of renal function. Else, when we combined their preoperative and 72 hour postoperative values, they predict renal prognosis with great precision.

5. Conclusions

At the end of this study, it emerges that the treatment of obstructive nephropathy is first surgical before being medical. The prognosis depends essentially on the cause, the duration of the obstruction, and the presence or absence of other comorbidities.

The priority therefore lies in the early diagnosis, and the rapid management of obstructive nephropathies before the evolution to chronic kidney failure.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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