

Epidemiological, Etiological, Therapeutic, and Evolutionary Aspects of Acute Obstructive Renal Failure in Adults at CNHU-HKM Cotonou from January 2019 to January 2023

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Abstract: -

Introduction: Acute obstructive renal failure (AORF) in adults is a severe urological condition caused by obstruction in the urinary tract, leading to impaired renal function. Understanding this condition is crucial for improving patient management.

Objectives: General Objective: To study the epidemiological, etiological, and diagnostic aspects of cases of acute obstructive renal failure (AORF) at CNHU-HKM.

Specific Objectives: To describe the epidemiological aspects of AORF at CNHU-HKM, to identify the etiological aspects (causes) and to identify the therapeutic and evolutionary aspects.

Patients and Methods: This retrospective and descriptive study was conducted on adult patients treated for acute obstructive renal failure at the urology and andrology departments and emergency services of CNHU-HKM from January 1, 2019, to January 1, 2023. Included patients had a sudden increase in serum creatinine exceeding 14 mg/L upon admission, associated with urinary tract obstruction confirmed by imaging. Data were collected and analyzed using Kobocollect and Excel software.

Results: 151 cases of acute obstructive renal failure were recorded out of 1720 hospitalizations during this period, representing 8.7%. The mean age of patients was 63 years, with a predominance of males (84.1%), giving a male-to-female ratio of 5.2. The majority of patients were civil servants (48%), followed by artisans and merchants (14% each). Main admission symptoms included lower urinary tract symptoms (55.6%), renal colic (13.6%), and hematuria (10.6%). The most common medical history included hypertension (39.1%) and diabetes (14%). Metabolic disorders observed included hypercreatininemia ranging from 15 to 306 mg/L (mean 64.1 mg/L), hyperuricemia from 0.50 to 1.89 g/L (mean 1.28 g/L); hyperkalemia in 17% of patients versus hypokalemia in 8% (extremes: 2.9 to 8.2 mEq/L); hyponatremia in 0.8% versus hypernatremia in 33.8% (extremes: 115-168 mEq/L); hyperchloremia in 7% and hypochloremia in 17% (extremes: 41-190 mEq/L). The main etiologies were tumors (prostate 59.6%, bladder 9.3%), followed by urinary stones (13.6%). Non-urological causes included cervical tumors in women (3.3%) and colonic tumors (1.3%). The obstruction was mainly subvesical (61%). The most common urinary drainage was urethral catheterization (40%), followed by JJ stent placement (20%). The predominant etiological treatment was transurethral resection of the prostate (15%), with prostatic drilling (14%). Hemodialysis was performed in 6% of patients. Serum creatinine normalized in an average of 10.03 days in 40.3% of patients, serum potassium in 6 days in 75.7%, and serum sodium in 9 days in 84.6%. Progression to chronic obstructive renal failure was observed in 7.9% of patients.

Conclusion: Acute obstructive renal failure is a frequent urological emergency at CNHU-HKM in Cotonou. The main causes are prostatic tumors followed by urinary stones. Rapid and appropriate management is essential to prevent progression to chronic renal failure.

Keywords: Acute obstructive renal failure, prostatic tumors, metabolic disorders, urinary drainage.

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Introduction

Acute obstructive renal failure in adults is defined as a rapid deterioration of kidney function over a few hours to days, secondary to an obstruction in the urinary tract that impairs the kidneys' ability to effectively filter waste and maintain electrolyte and fluid balance in the body. Acute obstruction can lead to a rapid decrease in the excretion of nitrogenous waste (such as creatinine and urea), disruption of electrolyte and acid-base balance, and fluid accumulation, resulting in edema and hypertension. If the obstruction is not promptly relieved, it can progress to acute tubular necrosis and eventually chronic renal failure. This is a medical emergency requiring rapid intervention to remove the obstruction and restore urinary flow to prevent permanent kidney damage.

The etiologies of AORF are diverse, with pelvic tumors being predominant. It is a common reason for urological consultation and can lead to severe complications if not diagnosed and treated in time. This study aims to investigate the epidemiological,

etiological, and therapeutic aspects of acute obstructive renal failure at CNHU-HKM.

Patients and Methods:

This was a retrospective and descriptive study of patients treated for acute obstructive renal failure at CNHU-HKM from January 1, 2019, to January 1, 2023, a period of 5 years, in the urology-andrology department. The study included adult patients of both sexes with a confirmed diagnosis of acute obstructive renal failure, having at least a creatinine dosage, urinary tract ultrasound, or non-contrast abdominal-pelvic CT scan, abdominal-pelvic MRI, cystoscopy, or UCRM. The diagnosis of acute obstructive renal failure was based on a sudden increase in creatinine levels above 14 mg/L at admission, associated with an obstruction in the urinary tract confirmed by imaging.

The variables studied included the epidemiological, etiological, and therapeutic aspects of acute obstructive renal failure.

Results:

A total of 151 cases were collected during the study period.

Epidemiological Aspects:

Age of Patients:

Table I shows the distribution of patients with acute obstructive renal failure from 2019 to 2023 at CNHU-HKM.

Age	Frequency	Pourcentage	Moyenne
18 - 20 years	2	1,3%	63years
20 -34 years	6	4,0%	
35 - 49 years	11	7,3%	
50 - 64 years	48	31,8%	
65 -79 years	61	40,4%	
80 -94 years	23	15,2%	
Total	151	100%	

The average age of patients with acute obstructive renal failure at CNHU-HKM between 2019 and 2023 was 63 years, with the majority in the age ranges of 65-79 years (40.4%) and 50-64 years (31.8%).

Sex of Patients:

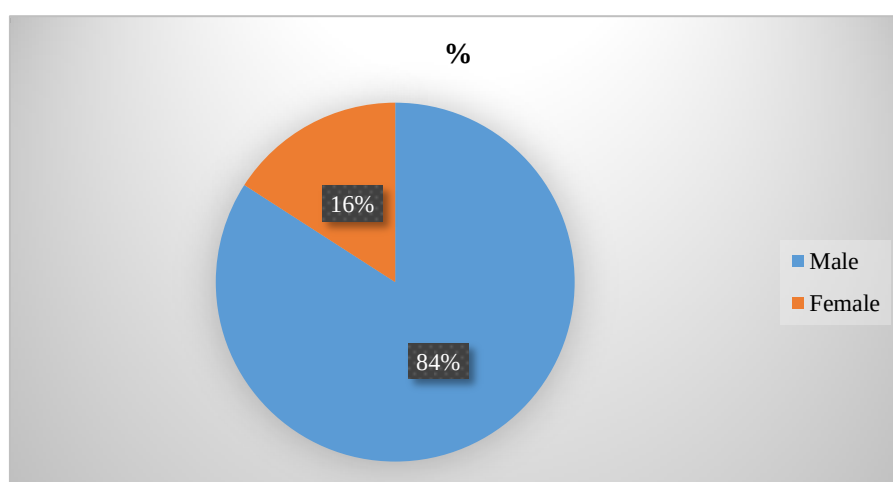


Figure 1: Distribution of patients with acute obstructive renal failure at CNHU-HKM from 2019 to 2023 by sex

From 2019 to 2023, acute obstructive renal failure predominantly affected males (84.1%) compared to females (15.9%).

Patient Occupation

Figure 2 shows the occupation of patients with acute obstructive renal failure at CNHU-HKM from 2019 to 2023.

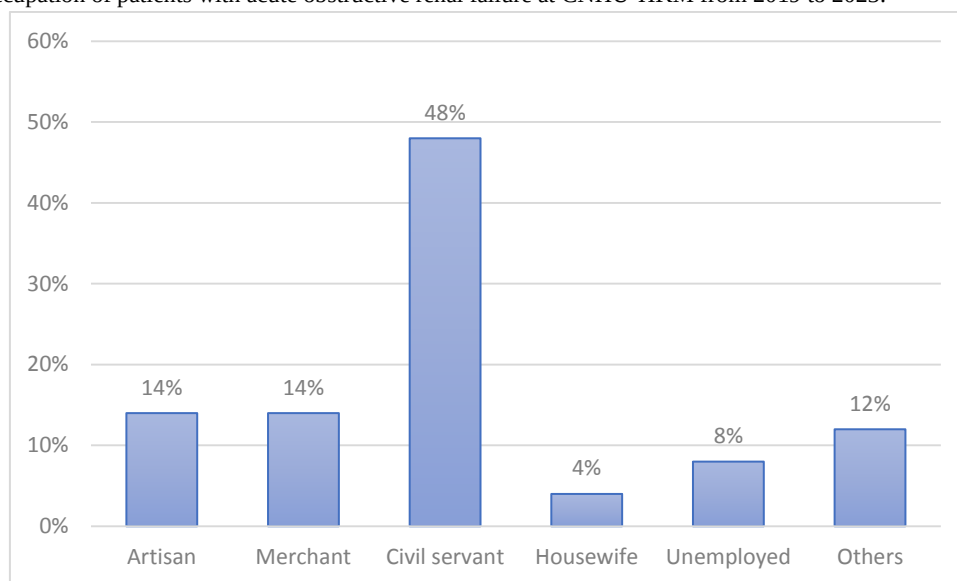


Figure 2: Distribution of patients with acute obstructive renal failure at CNHU-HKM by occupation

Patients with acute obstructive renal failure at CNHU-HKM between 2019 and 2023 were mostly civil servants (48%), followed by artisans (14%) and traders (14%).

Clinical Aspects:

Reasons for Admission

Table II: Distribution of admission reasons for patients with acute obstructive renal failure at CNHU-HKM

	Effectif	Pourcentage
"Lower Urinary Tract Symptoms (LUTS)	84	55,6
Renal colique	18	11,9
Hematuria	16	10,6
Lower back pain	12	7,9
Oligoanuria	7	4,6
Hypogastric pain	5	3,3
Complete urinary retention	5	3,3
General deterioration	2	1,3
Lower lim edema	2	1,3

The primary initial complaint of patients with acute obstructive renal failure at CNHU-HKM between 2019 and 2023 was lower urinary tract symptoms (LUTS) (55.6%), followed by renal colic (11.9%), hematuria (10.6%), and lumbar pain (7.9%).

Patient History

Table III: Distribution of patient history for those with acute obstructive renal failure at CNHU-HKM

ANTECEDENT	Effective	Pourcentage
Appendicectomy	2	1,3
Stroke	3	2,0
Bilharziose	6	4,0
Cardiopathy	1	0,7
Cure inguila herny	1	0,7
Diabetes	22	14,6
HIV	1	0,7

High blood pressure	59	39,1
Reccurent urinary infectionss	9	6,0
Hemorrhoidal disease	2	1,3
Bone tuberculosis	1	0,7
Gastro duodenal ulcere	1	0,7
Without any particular history	43	28,5

The most common antecedents were hypertension (39.1%), diabetes (14.6%), recurrent urinary infections (6%), and urogenital bilharzia (4%).

Renal Assessment at Admission

Table IV: Renal assessment at admission for patients with acute obstructive renal failure at CNHU-HKM between 2019 and 2023

	min	max	moy
Serum creatinine	15	306	64
Serum urea	0,50	1,89	1,28

The creatinine levels ranged from 15 to 306 mg/L with a mean of 64.1 mg/L, and urea levels ranged from 0.50 to 1.89 g/L with a mean of 1.28 g/L.

Electrolyte Imbalances at Admission

Table V: Distribution of electrolyte imbalances at admission for patients

	Low (%)	Normal (%)	high (%)	min (mEq/l)	Max (mEq/l)	Moyenne (mEq/l)
Natremia	33,8	65,5	0,7	115	168	135
Kaliemia	7,9	75,5	16,6	2,9	8,2	4,55
Chloremia	17,2	76,2	6,6	41	190	98,19

Between 2019 and 2023, 65.5% of patients had normal sodium levels at admission, 33.8% had hyponatremia, and 0.7% had hypernatremia. Nearly a quarter had potassium excretion disorders, with 7.9% having hypokalemia and 16.6% hyperkalemia. For chloride, 17.2% had hypochloremia and 6.6% had hyperchloremia.

Etiological Aspects:

Location and Nature of Obstruction

Table VIII: Different etiologies of acute obstructive renal failure at CNHU-HKM from 2019 to 2023

Obstacle localisation	Etiologie	Effectif	Percentage
Suprabladder	Ureteral stones	19	12,6
	Cervical neoplasia	5	3,3
	pyelo-Ureteral jonction syndrom	5	3,3
	Compressive abdominal tumor	2	1,3
	Colonic tumor	2	1,3
	Endometriel tumor	3	2,0
	renal tumor	6	4,0
bladder	Bladder stone	2	1,3
	Bladder tumor	14	9,3
Sub bladder	Uretral stenose	3	2,0
	Prostatic tumor	90	59,6

The leading causes of acute obstructive renal failure at CNHU-HKM between 2019 and 2023 were prostatic hypertrophy (12.6%), ureteral stones (12.6%), and bladder tumors (9.3%).

Diagnostic and Therapeutic Aspects:

Mode of admitting patients

Table IX: Different modes of admitting patients with acute obstructive renal failure at CNHU-HKM from 2019 to 2023

mode	percentage
Emergency	41%
Consultation	33%
Others services	26%

This table show that The main mode of admitting patients was emergency followed by outpatient consultation

Therapeutic Aspects:

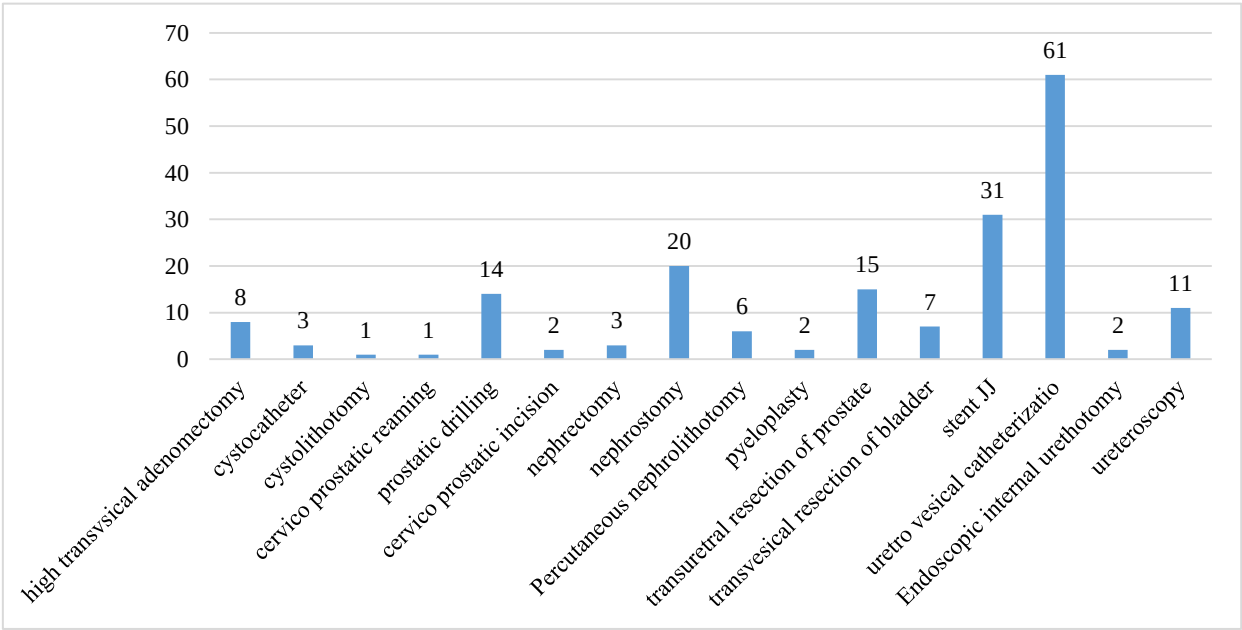
Between 2019 and 2023, all patients admitted to CNHU-HKM for obstructive acute renal failure (OARF) received medical treatment, which was combined with surgical treatment in 89% of cases and/or emergency hemodialysis in 6% of cases.

Type of Medical Treatment Used per Patient:

Analgesics were used in the majority of patients (94.4%), antibiotics in 88.1%, and alpha-blockers in 20.5%. Only 18.5% of patients received other treatments (including phytotherapy).

Types of surgery Treatment

Table X: Types of treatments used for acute obstructive renal failure at CNHU-HKM



CLINICAL EVOLUTION

The clinical outcome was favorable in 71% of patients with obstructive renal insufficiency (ORI) at CNHU-HKM between 2019 and 2023, with resolution of the admission reason after treatment, compared to 21% who had no clinical change.

Renal Function Evolution

On average, 10 days after the various therapeutic approaches used for ORI, only 40.4% of patients saw their renal function normalize, with creatinine levels dropping to less than 14

Ionic disorders

Table XIII: The Evolution of Natreミア and Kalemia After Treatment of OARF Cases at CNHU-HKM Between 2019 and 2023

Ionic Disorders	Min Value (mEq/L)	Max Value (mEq/L)	Average (mEq/L)	Improvement Rate (%)	Average Improvement Time (Days)
Natreミア	114	148	135.7	84.6	5.8
Kalemia	2.5	9.8	4.1	75.7	8.6

For excretory function improved in 84.6% of cases for natremia and 75.7% for kalemia over respective periods of 6 and 9 days on average.

Progression to Chronic Renal Failure:

We observed that between 2019 and 2023, only 7.9% of patients admitted with obstructive acute renal failure (OARF) at CNHU-HKM progressed to chronic renal failure.

Mortality:

11.9% of patients with OARF died as a result of their condition.

Discussion:

Epidemiological, Etiological, Therapeutic, and Evolutionary Aspects of Acute Obstructive Renal Failure in Adults at CNHU-HKM Cotonou

In our study examining the epidemiological, etiological, therapeutic, and evolutionary aspects of acute obstructive renal failure (AORF) in adults at the CNHU-HKM in Cotonou, we identified 151 cases of AORF out of 1,720 hospitalized patients, representing 8.7% of the hospitalized cases. This proportion is higher compared to the 57 cases (4.7%) reported by F. Hodonou et al. [1] in Cotonou and the 11.7% reported by Moussa Tondi et al. [4] in Niger. This increase might be related to the rising number of patients at CNHU-HKM over the years, the aging population which increases the risk of tumors, climate change, and delayed consultations.

The average age of patients was 63 years (range: 18-94 years), with a predominance in the 65-75 year age group (40.4%). These figures are higher compared to the average age of 51.9 years (range: 16-87 years) reported by A. S. Allodé et al. [2] in Tanguiéta.

Males predominated, accounting for 84.1% of cases compared to 15.9% females, resulting in a male-to-female ratio of 5.2. This predominance can be explained by the focus of the study in the urology-andrology department, where obstructive uropathies are predominantly due to male-related conditions such as prostatic tumors, and mixed conditions with a male predominance like urethral strictures and bladder tumors. The male predominance with a ratio of 7.3 is consistent with observations by Lanzy et al. [3] in Brazzaville.

The predominant mode of admission was through emergency services in 41% of cases, indicating delays in consultation and an increase in cases of AORF. This late consultation often leads to delayed diagnosis, with most patients only presenting at the stage of complications requiring emergency management.

This late presentation may also be attributed to the low socio-economic status of the population, lack of health insurance for some patients, and illiteracy. Indeed, 48% of patients were civil servants, 14% were artisans and traders, and 12% were unemployed or housewives.

Clinical Aspects:

The asymptomatic nature of some lower urinary tract obstructions or certain ureteral stones, which progress silently to hydronephrosis and renal parenchyma destruction, often leads to diagnostic delays. This aligns with findings by Giovanni S. M., Fabio C. V., Manoj M. et al. [8].

The dominant reason for consultation was lower urinary tract symptoms (LUTS) in 58% of cases, followed by renal colic in 11.9% and lumbar pain in 7.9%. These results are consistent with Halle MP et al. [13], where LUTS were predominant (42%), contrasting with Benghanem Gharbi M et al. [4] where lumbar pain was the major symptom (75%).

In our series, nearly half of the patients with AORF had no significant medical history (43%). Among those with history, hypertension was found in 39.1% of cases, diabetes in 14.6%, recurrent urinary infections in 6%, and urogenital bilharzia in 4%. The predominance of hypertension aligns with studies by Natchagande et al. in Cotonou (33.33%) and Khalil et al. [10] in Morocco (36.40%). The prevalence of diabetes (14.6%) is higher than reported in some studies [6] (5.88%) but lower than others [10].

Biological Aspects:

Creatinine levels ranged from 15 to 306 mg/L, with an average of 64.1 mg/L. Higher averages were observed in Cotonou [1] (127.5 mg/L) and Tanguiéta [1] (84.7 mg/L). Urea levels were found in 92.8% of cases (range: 0.50-1.89 g/L) with a mean of 1.28 g/L. The late consultation, leading to diagnostic delays, may contribute to these results.

Regarding electrolyte imbalances at admission, hyperkalemia was observed in 17% of patients and hypokalemia in 8%, with extremes ranging from 2.9 to 8.2 mEq/L. Hyponatremia was seen in 0.8% and hyponatremia in 33.8% (extremes: 115-168 mEq/L). Hyperchloremia was found in 7% and hypochloremia in 17% (extremes: 41-190 mEq/L). Similar reports include hyperkalemia in 12% of patients, hypokalemia in 4%, hyponatremia in 9.3%, and hyponatremia in 13.3% [2].

Etiologies:

The main etiologies of AORF at CNHU-HKM were benign and malignant prostatic tumors (59.6%), followed by urolithiasis (13.9%). These findings are consistent with those reported in Niger [11] with 72% of benign prostatic hypertrophies and 11% of urolithiasis, and Kassogue et al. [15] with 52% of benign prostatic hypertrophies and 17% of urolithiasis.

Non-urological cancers included cervical cancer invading the urethra (3.3%) and uterine myomas (3.12%), which were among the gynecological causes of AORF in our series. Rakototiana et al. in Madagascar found a similar result (3.9%), while Nedjim et al. in Morocco reported a higher frequency (23.7%). The high incidence of cervical cancer found at the stage of complications was the main gynecological cause of AORF.

The search for the site of obstruction revealed that infra-vesical obstructions were found in 93 patients, supra-vesical in 42 patients, and vesical in 16 patients (bilateral obstructions or on a single functional kidney), similar to data from Brazzaville [15].

Therapeutic Modalities:

Urethro-vesical catheterization was performed in 61 patients (40%), JJ stenting in 31 patients (20%), nephrostomy in 20 patients (13%), and cystostomy in 3 patients (0.02%). Similar figures were reported in Cotonou with 62% urethro-vesical catheterizations [1]. Adjuvant medical treatment was observed in most patients, with 94.4% receiving analgesics and 88.1% receiving antibiotics.

Among patients who received etiological treatment, transurethral resection of the prostate (TURP) was predominant at 15%, followed by prostatic drilling (14%), ureteroscopy (11%), and AVH (8%). The predominance of prostatic tumors as an etiology of AORF explains these data.

Hemodialysis was performed in 6% of cases, either in emergency situations where hydroelectrolytic complications or overload threatened short-term vital prognosis, or after the ineffectiveness of short-term urological treatment with the same risk.

Disease Evolution:

Guerrot et al. [4] reported that clinical and biological reversibility of acute obstructive renal failure is generally possible if permeability restoration is done early. In our study, 71% of patients experienced improvement in the main complaint at admission, with 29% showing no regression. Additionally, 40.3% of patients had normalized creatinine levels within an average of 10.03 days. Potassium levels normalized in 75.7% of patients within an average of 6 days, and sodium levels normalized in 84.6% within an average of 9 days.

Chronic renal failure developed in 7.9% of patients. However, due to the presence of comorbidities such as hypertension and diabetes in some patients, it was challenging to determine whether this chronic renal failure was exclusively due to the obstruction or rather to these comorbidities.

Mortality was 11.9% in our series, primarily due to late diagnosis and management. This figure is lower compared to that reported by Lanzy A et al. in Brazzaville (13.23%) and by Coulibaly et al. in Côte d'Ivoire (29.23%).

Conclusion:

Acute obstructive renal failure at CNHU-HKM Cotonou presents a significant medical challenge, with a predominance of cases among elderly men. The main etiologies include prostatic tumors and urolithiasis. While prompt management improves prognosis, delayed consultation remains a major barrier. Ongoing efforts are needed to raise public awareness for early detection and enhance therapeutic strategies to reduce mortality and associated complications.

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