AMERICAN JOURNAL OF MEDICAL AND CLINICAL SCIENCES, 2023
VOL 9, NO. 1, PAGE 1 – 3

RESEARCH ARTICLE

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Urinary Infections in the Elderly: Socio-Demographic, Clinical and Paraclinical Aspect about a Multicenter Study in Niamey (Niger)

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ABSTRACT

Introduction: Urinary infections in the elderly are common with atypical clinical signs that can impair quality of life. The objective of the study was to describe the sociodemographic, clinical and paraclinical aspects of urinary infections in the elderly at Niamey through a multicenter study.

Material and Methods: This is a descriptive cross-sectional study carried out over a period of 3 months from June 1 to August 31, 2022. The study population consisted of all urine samples collected in the laboratories of the three major hospitals in Niamey for Cytobacteriological Exam of Urin (CBEU) and concern patients aged at least 60 years.

Results: Of a total of 3757 samples, 110 (2.4%) were at least 60 years old. The average age was 70.8 years with standard deviation 7.4 and extremes of 60 and 93 years. The sex predominance was male in 77.3% with a majority of external origin urine collect (83.6%). The clinical complains for requesting ECBU were urinary burning in 57.3% of cases and infectious reason findings in 24.5%. Comorbidities were hypertension and diabetes found in 30 and 3.6% respectively. The appearance of urine was cloudy in 95.5%, the presence of bacteria in 96.4%, leukocytes in 95.5% and the species frequently isolated were *Escherichia coli* (60.9%) and *Klebsiella spp* (25.4%).

Conclusion: The risk of complications from urinary tract infection in the elderly is common in both sexes. The clinical signs are polymorphics and the isolated germs are dominated by gram-negative bacilli, notably *Escherichia coli* and *Klebsiella spp*. Keywords: urinary infection, demography, clinic-paraclinic, geriatric, Niamey.

ARTICLE HISTORY

Received 10 Dec 2023
Accepted 18 Jan 2024
Published 25 Jan 2024

KEYWORDS

Urinary tract infections.

Introduction

Urinary tract infections (UTIs) are one of the most common infections worldwide. UTIs are defined as an infection of the urinary system that involves the kidneys, urethra, bladder, or ureter, accompanied by infectious manifestations. It is associated with a decrease in the quality of life of patients and a significant clinical and economic burden. The UTIs burden including incidence, mortality, and DALYs among elderly people tended to increase with age, and the annual increasing trend was more obvious for people over 60 years of age in most sociodemographic index (SDI) regions [1,2]; In west Africa, the mortality was 2,3% reported by Xiaorong et al. [3]. UTIs are heterogeneous with regard to their etiology, clinical manifestations, and disease course, which range from simple (urethritis and cystitis) to severe (pyelonephritis, bacteraemia and septic shock [4]. There is sometimes an atypical clinical presentation in elderly, Furthermore, the pathogenic microorganisms of UTI are various, with significant changes by years and differences by countries or regions [5,6]. Several studies realized by authors in Mali, Tunisia, Morocco found variables prevalence from 14 to 17% and different clinical and paraclinical aspects [7-9]. In Niger, there is no data about urinary track infectious.

Methods

This was a descriptive cross-sectional study carried out over a period of 3 months from June 1 to August 31, 2022. The study population consisted of all urine samples collected in the laboratories of the three hospitals in Niamey. (General Reference Hospital, Niamey National Hospital and Amirou Boubacar Diallo National Hospital) for ECBU. Included in the study were samples collected and analyzed in the three hospitals in Niamey during the study period from subjects aged 60 and over. These samples came from hospitalized patients (internal patients), or from other extra-hospital (external) health structures. Samples collected and analyzed whose results were lost or illegible during our study period. Three strata were considered according to the laboratory department of each hospital in Niamey. In each

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hospital the sampling was exhaustive. A documentary review of the laboratory department registers of the three Hospitals was used as a database. A pre-established survey sheet served as data collection and extraction tools (see appendices). An input mask created on Epi Info (version 7.2.3) served as a tool for recording data from the creation of the database. A descriptive analysis of the variables in the form of tables and figures was carried out. We had previously received research authorization of the authorities of the three hospitals in Niamey. The variables studied were. Average age, gender, origin of urine, clinical complains, macroscopic appearance, bacteriuria, leukocyturia and bacteriological species identified.

Results

The average age was 70,8 years olds standard deviation 7.4 and extremes of 60 and 93 years.

Species *E coli* is frequent in women and *Klebsiella* is major in men without statistically difference. Urinary burning, abdominal pain and dysuria is major in patients with *E coli* but Fever were found only with *klebsiella.*

Table 1: Sociodemographic, clinical and paraclinical aspects of CBEU.

Socio demographic aspect	n = number	Percentage (%)
Sex:		
Female	25	22,7
Male	85	77.3
Origin of urine		
External	92	83,6
Internal	12	16,4
Reasons of CBEU		
Urinary burning	63	57,5
Infectious reasons	27	24,5
Dysuria	8	7,2
Abdominal Pain	10	9
Fever	2	1,8
Comorbidities		
HBP	33	30
Diabetes	4	3
HBP+ diabetes	2	2
No precised	71	65

There is a predominance of male, major origin external and frequent complains about urinary urning in elderly.

Table 2: Macroscopic paraclinics aspect of CBEU.

Paraclinic	N = number	Percentage (%)
Macroscopic test		
Cloudy	104	95,5
Clear	5	4,5
Hemorrhagic	1	0,9
Leukocyte		
Leukocyturia	105	95,5
Normal	5	4,5
Bacteria		
Bacteriuria	106	96,4
Normal	4	3,6

Profile of isolate species.

Table 3: Distribution of germs isolates by symptoms.

Symptoms Espèces	Urinary burning	Abdominal pain	Dysuria	Fever
Escherichia coli	40	7	5	0
Klebsiella spp	13	1	3	2
Serratia spp	4	2	0	0
Enterobacter spp	3	0	0	0
Citrobacter spp	2	0	0	0
Proteus spp	2	0	0	0

Urinary burning was frequently found with E coli

Table 4: Distribution of isolate germs by, sex and symptoms.

		Male/ Female	P value	Urinary burning	Abdominal Pain	Dysuria	Fever
E Coli	No	36 7					
	Yes	49 18	0.14	40	7	5	0
Klebsiella. Spp	No	61 21					
	Yes	24 4	0.94	13	1	3	2
Serratia Spp	No	80 23					
	Yes	5 2		4	2	0	0
Enterobacter spp	No	41 24					
	Yes	4 1		3	0	0	0
Citrobacter spp	No	83 25					
	Yes	2 0		2	0	0	0
Proteus Spp	No	83 25					
	Yes	2 0		2	0	0	0

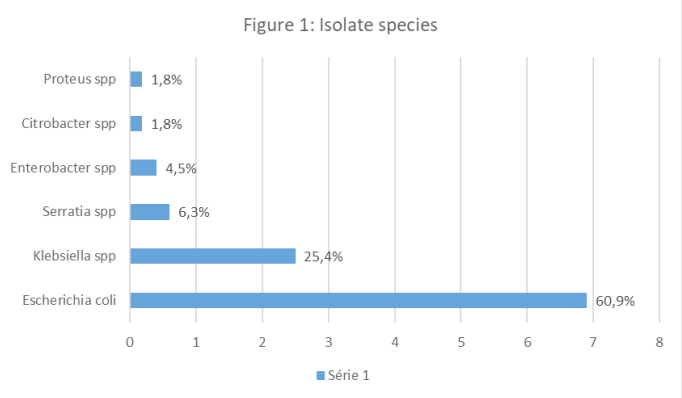

Figure 1: *Escherichia coli et klebsielle spp* are germs species frequently found.

Discussion

The prevalence of UTIs in our study was 2,3%, an average age about 70,8 years old and men predominant in 77,3% of cases. Sangaré et al in Mali found 14,4%, 69 years for average age

and women predominance and Saka and al reported the same results in Nigeria [7,10]. In North Africa the prevalence varies from 10,3 to 16,6%, an average age from 68 to 70 years and men predominance like in our study [8,9]. In European countries, the incidence is higher in oldest women with average age over than 75 years for example 140 for 1000 elderly women patient than men with 50 for 1000 elderly men patient [11-13]. European and America countries is characterized by oldest population higher than Africa in which the age of inclusion for study is variable. The women predominance could be explained by the greater distance between the urethral meatus and the anus, a dry environment and anti-bacterial secretions from the prostate in men. Older women are more prone to UTIs than older men; the incidence of UTIs in women is 12.8% compared to men, which is only 7.8% [14] Urinary infectious symptoms frequently found in our study are urinary burning in 63 cases, fever 28 cases, abdominal pain in 10 cases and dysuria in 8 cases. In Mali, Sangaré et al. found the same predominance for urinary burning and fever but reported confusion in 8 cases [7]. Chandrani D et al. found atypical presentation of UTI in elderly patient respectively delirium or confusion in 28,9% of cases, Hypotension in 20% of cases, Tachycardia 11,1% of cases and fever 11% of cases [15]. In our study the absence of atypical sign like delirium could be explained by the ignorance of atypical signs of infectious in elderly, also Nigerien's medical physicians are not educated about geriatric domain. On macroscopic exam, the apparency of urine was cloudy in 95% of cases, leukocyturia and bacteriuria in respectively in 95% of cases. In Saka A et al. study, more than half percent of participant had no significant bacteriuria [10]. In the case of a UTI, urine microscopy shows the presence of more than 10 leucocytes per high-power field, which is termed pyuria, and the presence of bacteria termed bacteriuria [2,19]. Urine culture and sensitivity are considered the gold standard for diagnosis of UTI, the presence of more than 1,00,000 colony-forming bacteria of a single organism in urine is diagnostic of UTI [16,17]. In our study, *E coli* in 60% of cases and *Klebsiella spp* in 25% of cases are frequently found. The literature review corroborates our results [7-11]. The bacilli gram positive are secondary found with *Streptococcus sp* species in 10,7% of cases, *Streptococcus and coagulase-négative Staphylococcus* in 3,7% of cases[18].

Conclusion

The risk of complications from urinary infection in the elderly is common in both sexes. The clinical signs are polymorphic and atypical and the bacterial ecology is dominated by gram-negative bacilli, notably *E coli* and *Klebsiella*.

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