

Magnitude of urological emergencies and immediate management at Muhimbili national hospital

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**MAGNITUDE OF UROLOGICAL EMERGENCIES AND IMMEDIATE
MANAGEMENT AT MUHIMBILI NATIONAL HOSPITAL**

By

Andrew Gervas Urassa

**A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree
of Master of Medicine (Urology) of**

**Muhimbili University of Health and Allied Sciences
October, 2021**

CERTIFICATION

The undersigned certifies that they have read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: “**Magnitude of Urological emergencies and immediate management at Muhimbili National Hospital**”, in (partial) fulfillment of the requirements for the degree of Master of Medicine (Urology) of the Muhimbili University of Health and Allied Sciences.

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Date

Dr. Steven Nicholas Kaali

(Co – Supervisor)

Date

DECLARATION AND COPYRIGHT

I, **Andrew Gervas Urassa**, declare that, this **dissertation** is my original work and that it has not been presented and will not be presented to any other University for similar or any other degree award.

Signature..... **Date**.....

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DEDICATION

This work is dedicated to my dear and lovely wife, Winfrida for her support, patience and care during the whole period of my studies.

This is also a dedication to my Children Gladness, Ivana and Flaviana. Although they are very young to offer me material support; their waving hands when I left home for school and their whole heartedly hugs when I returned home, always gave me a reason to work harder for their brighter future.

Last but by no means the least, is a dedication to my father in-law and a friend, Mr. Ariustarick Urassa for his support in many unnumbered ways throughout my study period.

ABSTRACT

Background: Urological emergencies can cause morbidity and mortality. There are different forms of urological emergencies like: Acute urine retention, Priapism, Fournier's gangrene, Penile fracture, Gross haematuria with clot retention, Paraphimosis, Genitourinary injury and testicular torsion. When emergency intervention is not taken, it can lead to renal failure, testicular atrophy, penile auto amputation, erectile dysfunction, infertility and death. Despite most urological emergencies ending with emergency surgical intervention performed in the urology department and being associated with short-and long-term morbidities, there is still no available data on magnitude, types, causes, immediate management, and treatment outcome. This study aims at providing data about social demographic characteristics, magnitude, types, causes, immediate management and treatment outcome of urological emergencies at MNH.

Objectives: To assess magnitude of different types, immediate management and treatment outcome of urological emergencies at MNH.

Methodology: A cross-sectional observational study was conducted within seven months from September 2020 to March 2021, involving patients with different Urological emergencies.

A total of 80 patients were involved in this study. Demographic data, clinical presentation, causes, immediate treatment and treatment outcome were recorded using a questionnaire and analyzed by SPSS version 24.

All patients with urological emergencies admitted into the emergency department, MOI and MNH were recruited in the study. A standardized pre-tested english questionnaire was filled by the investigator.

Data were extracted directly from the patients, patients' files/ operation notes and operating staff. Data was presented by using frequency, mean, standard deviation and P value less than 0.05 was considered significant.

Results: During the research period of seven months, there were 80 patients with different types of urological emergencies. During the same period, the total numbers of patients admitted with other urological conditions were 1752, and the proportion of urological emergencies was 4.6%.

The proportion of patients with different types of Urological emergencies at MNH were; acute urine retention 42.5%, Genitourinary injury 18.6%, Gross haematuria with clot retention 15%, Fournier's gangrene 8.8%, Priapism 7.5%, Testicular torsion 3.8% and Paraphimosis 3.8% of the total emergencies.

Immediate treatment of patients with urological emergencies at MNH were; SPC 31.3% and urethral catheterization 15% for patients with AUR, urethral catheterization, clot evacuation and irrigation with normal saline 13.8% for patients with gross haematuria with clot retention, debridement of gangrenous part 8.8% for patients with Fournier's gangrene, laparotomy 7.5% and URS plus DJ stent 2.5% for patients with Genitourinary injury.

Treatment outcome of the patients who were attended at MNH with urological emergencies were 93.8% successful, mortality rate of 3.75% and complication rate of 2.54%.

Conclusion: Acute urine retention and genitourinary injury were the commonest urological emergencies at MNH.

The immediate treatments of patients with urological emergencies at MNH are Urethral catheterization and suprapubic cystostomy.

Treatment outcome of patients with Urological emergencies attended at MNH were mostly successful, with low mortality and complication rate.

There was a significant delay in reporting to the hospital and starting definitive treatment once arriving at the hospital.

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LIST OF ABBREVIATIONS

AUR	Acute Urine Retention
AIDS	Acquired Immunodeficiency Syndrome
BPH	Benign Prostate Hyperplasia
CBI	Continuous Bladder Irrigation
CBC	Complete Blood Count
CT	Computer Tomography
DRE	Digital Rectal Examination
IV	Intravenous
KCMC	Kilimanjaro Christian Medical Center
LUTS	Lower Urinary Tract Symptoms
MNH	Muhimbili National Hospital
Mmed	Master's of Medicine
MUHAS	Muhimbili University of Health and Allied Sciences
SA	South Africa
URS	Ureterorenoscope
DJ Stent	Double J Stent
GUI	Genitourinary injury
Yrs	Years

OPERATIONAL DEFINITION OF TERMS

Urological emergencies: This is a urological emergency that requires immediate medical attention and can be results of long-term neglect of an underlying disorder, infection or a recent trauma [1]

Prevalence: Is the proportion of a population who have urological emergencies in a time period or is the total number of individuals in a population who have urological emergencies at a specific period of seven months, usually expressed as a percentage of the population. Where by proportion will be number of urological emergency over total number urological condition within seven months [2].

Immediate management: Is immediate intervention given to the patient with urological emergencies condition including investigation and treatment [3].

Medical outcome: These are outcome of patients with urological emergencies condition this can be treatment outcome either successful, unsuccessful or complication, treated as outpatient or inpatient, and delay in reporting or treatment [4].

CHAPTER ONE

1.0 INTRODUCTION

GENERAL OVERVIEW

A substantial number of urology admissions constitute emergency cases, and sizeable proportion in urology emergencies are referral cases. There few studies that have been conducted on this, but they rely on geographical variations in the presentations of urological emergencies. Any physician caring for patients must be able to recognize, diagnose, and treat urologic emergencies immediately. Failure to recognize true urologic emergencies may result to renal failure, erectile dysfunction, infertility and death.

Worldwide, the magnitude of urological emergencies was 27.18% in the urological departments [5]. A urological emergency constitutes 6% of all surgical emergencies [5]. The number of Patients admitted with urological emergencies was 15.6% [6]. Common urological emergencies were: renal colic 24.2%, Gross haematuria with clot retention 17.4% and AUR 14.7% [5]. Renal and urogenital injuries occur in approximately 10-20% of abdominal trauma in adults and children [8, 9]. Management should take into consideration anatomic injury, hemodynamic status and the associated injuries [10].

In Africa, the magnitude of urological emergency varies from one place to another due to geographical variation and seasonal [11]. Fifty one percent of patients with urological emergencies were admitted for further management, while 44.6% were treated at EMD and discharged [11]. Although there are other urological emergencies that cause morbidity and mortality, the most common ones are acute urine retention, priapism, Fournier's gangrene, gross haematuria, and genitourinary injury.

In a sub-Saharan country, urological emergencies are still a challenge in district hospitals. Only half of the urological emergencies receive emergency urological management [12]. The remaining half who don't receive emergency treatment endup with morbidity and permanent complication [12].

In Tanzania, 33% of the nurses who participated in the study were not knowledgeable about triage in emergency situation, 13% of the respondent reported that although they had attended workshop still cannot triage patient and 58% of respondent had no knowledge on waiting time for triage [13]. The 48 health facilities were assessed because there was a significant gap in the health capacity on emergency and essential surgical care, deficit exist in human resources, essential equipment and infrastructure [14].

In MNH at the urology department, there are consultations at emergency department and admission in the ward with different forms of urological emergencies and most of them were managed by medical and surgical interventions. Typical urological emergencies at MNH were AUR, Gross haematuria with clot retention, Fournier gangrene, Priapism, genitourinary injury and testicular torsion.

1.2 Literature Review

A study done in Guinea showed that the mean age of patients with AUR was 58.6yrs and high frequency over 60yrs [15]. The mean age for patients with AUR was 42.27 ± 19.1 [16]. Most people with low social-economic status seek medical attention after complication [15]. In Senegal, AUR is a common urological emergency by 58% [15]. Estimated incidence of AUR was between 5 and 25 per 1000 person-years, or 0.5% to 2.5% per year [18]. However, this risk was cumulative and increased with advancing age [17]. Causes of Acute urine retention were categorized as obstructive, infectious and inflammatory, pharmacologic, neurological, neoplasm, trauma, strictures, and valves [16, 19]. Immediate management of patients with AUR were: urethral catheterization 35%, suprapubic cystostomy 23% and others were managed by alpha-blocker and Trial without catheter 25% [16, 19]. In a study which involved 72 patients, 31 patients remained on α -blockers without a further episode of AUR within a minimum of 6 months follow-up, 22 patients were managed by transurethral resection of the prostate, 15 long-term catheterizations, three prostatic stents and one patient died before intervention [18].

In a study done at KCMC, 78% of patients with testicular torsion had 13yrs with a mean age of 16.92 [21]. Testicular torsion involves twisting of spermatic cord and its contents and is a surgical emergency affecting 3.8 per 100,000 males younger than 18 years annually [22]. It accounted for 10% to 15% of acute scrotal disease in children and resulted to 42% rate of orchiectomy in boys undergoing surgery for testicular torsion [20]. The most commonly adopted treatment option by 55.4% for the treatment of testicular torsion was orchiectomy of the affected testis and fixation of the unaffected testis [21]. Eighty four percent of the patients had firm and smooth testis at follow up of three months, with 16% having atrophic testis at three months in both groups [21].

There was a bimodal distribution of Priapism, with incidence occurring between 5 and 10 years in children and 20 to 50 years in adults [23]. The annual incidence rate of Priapism was 5.34 per 100,000 males, and the rate of visits was 31.4% higher in summer months than in winter [23]. In a study done in Nigeria, the proportion of Priapism was 39.1% [24]. First-line

therapy for patients with episodes of acute ischemic Priapism was an aspiration of blood with irrigation of the corpora cavernosa with α -agonist injection therapy [25]. A greater resolution of ischemic Priapism was obtained after injection of a sympathomimetic agent with or without irrigation (43–81%) than after aspiration with or without irrigation alone (24–36%) [25]. If aspiration of blood with irrigation of the corporal cavernosa failed, immediate surgical shunting was done. The goal of surgery was to create a channel or fistula that allowed the deoxygenated blood to be drained outside of corporal cavernosa [25]. There were four shunts: percutaneous distal shunts, open distal shunts, open proximal shunts, and vein anastomosis/shunts [25]. A study done by Henry P. Gottsch in the USA 2012 showed that factors that caused priapism were: drug-induced 38%, neurogenic priapism 19% and SCD 18% [26].

In a study done in Rio de Janeiro, there were 40 patients with Fournier's gangrene, of these 29(72.5%) were men and 11(27.5%) were women [27]. The mean age was 51.7+-16.3years [23]. The overall incidence of Fournier's gangrene was 1.6/100,000 males [28]. The proportion of Fournier's gangrene were 8.6% by CK Okeke [19]. The most common foci include the gastrointestinal tract (30–50%), followed by the genitourinary tract (20–40%), and cutaneous injuries (20%) [29]. Comorbid systemic disorders at risk for Fournier's gangrene were: diabetes mellitus, alcohol misuse, extremes of age, malignancy, chronic steroid use, cytotoxic drugs, lymphoproliferative diseases, malnutrition, and HIV infection [29]. A research study at Bugando hospital showed that factors that caused Fournier's gangrene were: diabetes mellitus 16.7% and HIV positive 11.3% [30]. The best treatment modalities of Fournier's gangrene were resuscitation, broad-spectrum antibiotics and debridement [29]. Fournier's gangrene is still a disease with high mortality rates, and physician should suspect, diagnose it early and have an aggressive treatment approach to achieve better outcomes [29].

Ninty five point four percent of patients with penile fracture had a mean age of 34.5 years (range: 18–60) [31]. Penile fracture had an incidence of 1.02 per 100,000 male subjects per year. The causes of penile fracture was abrupt bending of the erect penis by blunt trauma, which may occur during sexual intercourse, masturbation, rolling over on the bed, or falling

onto the erect penis [32]. Sixty three point nine percent were treated non-surgically and discharged from the ED, 25.7% underwent surgical repair, and 10.3% were transferred to other institutions for further management [32]. Fracture of the penis is also a surgical emergency that can be best managed by immediate surgical repair with excellent results even in the presence of urethral injury [31]. Patients with penile fractures undergoing delayed repair had preserved erectile potency, and overall sexual function was maintained [31].

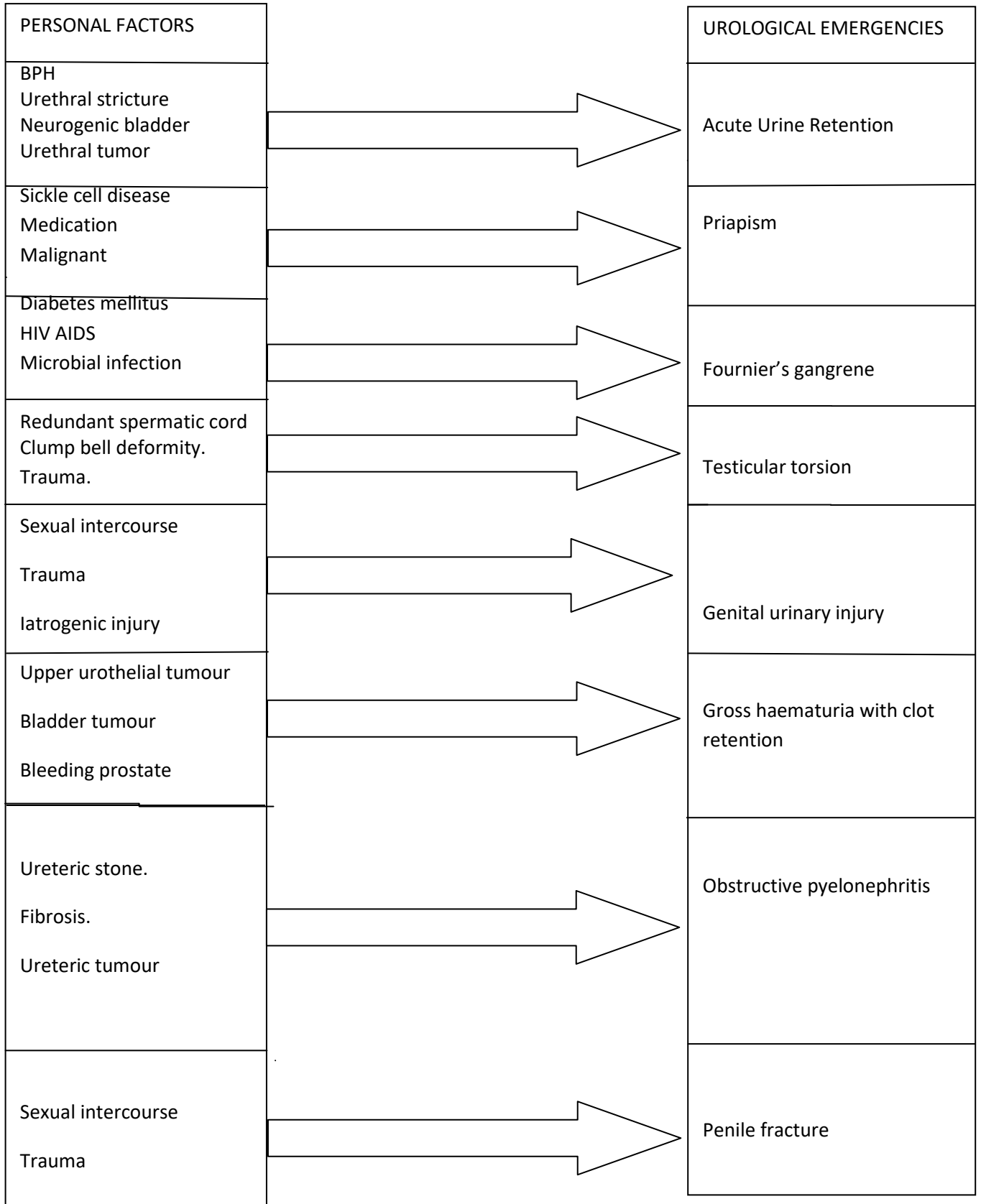
Men were approximately five times more likely to have a urethral injury than women [33]. A recent population-based study found an incidence of renal injury of 4.9 per 100,000 populations [34]. Urethral trauma responsible for 2.5% of GU trauma [33]. Three-point six per cent of patients presenting with a pelvic fracture had a concomitant bladder injury [34]. A urethral injury in the trauma population, accounting for approximately 4% of GU trauma [34]. The proportion of GUI is 10-20% [35]. The causes of genitourinary injury were: blunt injury, penetrating injury and iatrogenic injury [34]. The management of kidney and urogenital trauma is multidisciplinary; when feasible, non-operative management should always be considered the first option [33]. For this reason, the anatomy of the injury, its physiological effects, and the associated injuries should always be considered to define the best treatment strategy [33].

In uncircumcised children, four months to 12 years old, with foreskin problems, the proportion of paraphimosis was 0.2% to 1% less common than other penile disorders [36]. In adults, paraphimosis most commonly was found in adolescents [36]. It would occur in about 1% of all adult males over 16 years of age [36]. Paraphimosis usually caused by poor hygiene, chronic balanoposthitis, or forceful retraction of the prepuce leading to tight fibrotic ring procedures such as penile examination, urethral catheterization, cystoscopy, or endoscopic surgery of the bladder or urethra without replacing the prepuce in its reduced position [37]. Treatment of paraphimosis involved reducing penile oedema and restoring the prepuce to its original position to cover the glans penis [37]. Manual reduction of the prepuce should first be attempted by displacing the edematous fluid out of the glans and prepuce and then manipulating the constricting band over the glans [37]. An invasive procedure was indicated

after simple manual reduction had failed, puncture to one or several openings into the edematous prepuce distal to the constricting ring allowed edematous fluid to escape from the puncture sites with manual compression of the glans and prepuce [37]. If manipulation failed, the dorsal slit could be done using 1% lignocaine penile block; the constricting preputial band was identified at the 12-o'clock position, perpendicular to the corona, and sharply incised [37].

Macroscopic haematuria is more concerning and warrants a thorough investigation, as the prevalence of urinary tract carcinomas among patients with macroscopic haematuria has been reported to be as high as 19% but usually ranges from 3–6% [38]. The cause of macroscopic haematuria can be: bladder tumour, renal (kidney and renal pelvis), ureteric, prostatic and urethral malignancies, and benign causes include benign prostatic hyperplasia, urinary tract calculi, urinary tract infections, nephrological problems and genital, urinary trauma[39]. In macroscopic haematuria, the patient should be resuscitated, and blood transfusion, when necessary, should be encouraged to drink enough fluid to remain hydrated and free urinary drainage should be ensured with or without a urinary catheter in-situ [39]. The cause of the haematuria should be identified and treated [39].

1.3 Conceptual framework



It explains causes (independent factor) of different types of urological emergencies, independent factor was arranged in a group of each urological emergencies (dependent factors) example independent factors of AUR were BPH, urethral stricture, neurogenic bladder and urethral tumour.

1.4 Problem statement

Different types of urological emergency are common encounter and admission at MNH. There are large numbers of patients with urological emergencies conditions who need emergency treatment.

Different studies have shown that different forms of urological emergencies are associated with short term and long-term morbidities such as renal failure, erectile dysfunction, auto amputation of the glans penis, infertility and death. Renal failure correlates strongly with upper urinary tract obstruction and lower urinary tract obstruction, which lead to acute urine retention secondary to BPO, stricture and neurogenic bladder.

Most patients with different forms of urological emergencies at MNH will need emergency treatment; for example, Acute urine retention will need urethral catheterization or suprapubic cystostomy, Priapism will need corporal aspiration if failed distal or proximal shunt, Testicular torsion will need emergency orchidopexy, Fournier's gangrene will need IV antibiotics and debridement also gross haematuria with clot retention will need evacuation of clot and irrigation with a three-way catheter.

However, there is no available research data on the magnitude, causes factors, immediate management and treatment outcome of urological emergencies in our hospital.

Patients with different forms of urological emergencies delay in seeking immediate urological treatments since the onset of symptoms.

Also patients are delayed in the initiation of immediate treatments after arrival in the hospital and challenge in providing treatments in emergency situation.

1.5 Rationale of the study

Urological emergencies need to be assessed to know the magnitude, causes, immediate management and treatment outcome of urological emergencies. Urological emergencies are common encounters and admission at the department of urology at MNH.

This study will help us know the magnitude, causes factor, immediate management and treatment outcome of urological emergencies at MNH.

This study also provides information for future planning of surgical management of urological emergencies,

It helps in understanding of the challenge of delays in seeking and initiating treatment that need to be addressed.

Hence reduce both morbidity and mortality that result from the urological emergencies.

1.6 Research Questions

1. What is the magnitude of urological emergencies at MNH to compare with other urological condition?
2. What is the immediate management of urological emergencies at MNH?
3. What is the treatment outcome of urological emergencies at MNH?
4. What are the causes of urological emergencies at MNH?

1.7 Objectives

1.7.1 Broad Objective

To assess magnitude of urological emergencies and immediate management at MNH

1.7.2 Specific Objectives

1. To determine the proportion of urological emergencies compare to other urological condition at MNH.
2. To assess how urological emergencies are managed at MNH.
3. To assess treatment outcome of urological emergencies at MNH.
4. To determine the causes of different types of urological emergencies at MNH.

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study design

This was a cross-sectional, Prospective study conducted for the period of 7 months started from September 2020 to March 2021.

2.2 Study population

All patients with urological emergencies seen at MNH during seven months of the study period.

2.3 Study area

This study was conducted at Muhimbili National Hospital (MNH). MNH is a National Referral Hospital and University Teaching Hospital consisting of two centers. The first center is based in Upanga (West) in Ilala District, Dar es Salaam. It is a 1,500 bed facility, attending 1,000 to 1,200 out patients a day, admitting 1,000 to 1,200 inpatients per week. The study will involve urology patients admitted at Kibasila, Sewaji, Obstetrics ward, Emergency department and MOI. The second centre is located in Mloganzila, Kwembe, Ubungo district. It is a 750 bed facility and the focus is on urology patients in wards 72, 82 and 91

The Urology Department encompasses the aforementioned wards; where in wards 14 and 17 at MNH Upanga campus are dedicated to male urology patients each with a bed capacity of 32 patients. Wards 9 and 12 accommodate female patients from both general surgery and urology. Bed capacity dedicated in either ward is 8 beds each to urology patients. A variable number of admission are admitted to wards 15 (Female), 16 (Male) and 18. MNH Upanga is equipped with two dedicated operating theatres for urological cases, Theatres V and VI. Both theatres are equipped for both endoscopic and open procedures. Attached to the theatre suits is a Renal Intensive Care Unit, dedicated to renal transplant patients with bed capacity of 4.

The Mloganzila Campus also has a variable number of urological patients in Ward 71(Female) and 72 (Male) as these are mixed with General Surgery patients and ward 82 for private admissions. Theatre 5 is dedicated to Urological cases and has the capability to take care of both open and endoscopic procedures.

The Urological service is manned by both staff from Muhimbili National Hospital and Muhimbili University of Health and Allied Sciences (MUHAS). The complement includes four Professors, 14 full time specialists, 3 fellows, 19 residents and 4 registrars.

Recruitment

All patients with urological emergencies admitted into the emergency department, MOI and MNH were recruited in the study. Urological emergency was diagnosed through clinical presentation, for example patient with AUR presented with a history of unable to pass urine, lower abdominal pain and distension. The investigator made the diagnosis through a clinical presentation. Recruited patients were asked questions from the questionnaire, and other information about them was obtained from their file and operating staff.

2.4 Sample size and selection

Sample size from a large population

$$\begin{aligned} n &= z^2 p (100-p) / \epsilon^2 \\ &= (1.96)^2 \times 27.81(100-27.81) / (5)^2 \\ &= 308 \end{aligned}$$

Where:

- n: sample size from a large population
- z: percentage point of normal distribution corresponding to the level of confidence (95% of C.I=1.96)
- P the proportion of patients with urological emergency conditions was 27.81 study done ShyamTalreja et al in India 2015.
- ϵ : margin of error 5%.

However, the sample size for a finite population was applied to calculate the minimum required sample size since the size of the population from an observational pilot study for patients who have different conditions of urological emergency at MNH was about 96 within a six month (N)

nc: adjusted sample size from a finite population.

$$\begin{aligned}nc &= n / (1+n/N) \\ &= 308 / (1+308/96) \\ &= 73\end{aligned}$$

- Therefore, from the above formula, the required sample size of patients with urological emergencies was 73 patients.

- Adjusting for the non-response rate, which is 10%, the minimum sample size of patients with urological emergencies became 80 patients.

2.5 Inclusion criteria

All patients with urological emergencies at an emergency department and admitted to the wards and consent to participate in the study.

2.6 Exclusion criteria

All patients with recurrent urological emergencies conditions. For example, if the patient had priapism for the first times, then admitted second times with the same diagnosis of priapism were excluded.

2.7 Data collection methods

A structured questionnaire with demographic data, clinical presentation, different Urological emergencies, immediate management, and treatment outcome.

Information was gathered directly from patients and patient files by asking a different question about the clinical presentation, causes, and management, the hour of delay in arriving in

hospital since the onset of symptoms, the hour of delay in receiving emergency services, and treatment was successfully or not.

Intraoperative information was gathered from the file and operating staff.

2.8 Data analysis and management

Independent variable: were patient biodata, BPH, Urethral stricture, neurogenic bladder, HIV, trauma, DM, SCD, clump belly deformity, urothelial tumour and sexual intercourse.

Dependent variable: were urological emergencies example, AUR, Fournier gangrene, Priapism, Testicular torsion, genitourinary injury and gross haematuria with clot retention.

Objective number one on the magnitude of Urological emergencies at MNH was analyzed using frequency distribution of patients with a different form of Urological emergencies then dividing by the total number of patients admitted with different forms of the urological condition within the study period of seven months.

Objective number two on the immediate treatment of Urological emergencies at MNH was analyzed by using frequency distribution.

Objective number three on the medical outcome of urological emergencies at MNH was analyzed using a mean, so the mean of delay in reporting, receiving, and duration of hospital stay was determined. Also, treatment outcome was analyzed by using frequency distribution, mortality rate and complication rate.

Objective number four on determining the causes of different types of Urological emergencies at MNH was analyzed using frequency distribution.

Data were managed and analyzed by using SPSS program version 24. Data quality were checked daily, sorted, coded and entered into the program.

An association with P-value less than 0.05 were considered significant.

Data presentation and interpretation from one variable table, two ways tables, and bar charts were used.

2.9 Ethical issues

The study protocol followed the ethical guidelines of the 1975 Helsinki Declaration.

Approval of the study was sought from the MUHAS research ethics committee.

Written informed consent or assent (for those under 18 years) to participate in the study was obtained from each patient. In an emergency situation, written informed consent was obtained from a relative. Voluntary participation and the right to withdraw from the study at any time were emphasized.

Permission to collect data was obtained from the Teaching, Research, and Consultancy Coordination Unit of the MNH. Confidentiality of subjects' data was and will be maintained.

CHAPTER THREE

3.0 RESULTS

3.1 Demographic data of patients with different types of urological emergencies during the study period of 7 months.

Table 1 : Demographic data of 80 patients with different types of Urological emergencies

Age group	Percentage
<29 yrs	18(22.5%)
30-59 yrs	27(33.8%)
>60 yrs	35(43.8%)
Sex of patients	
Male	72(90%)
Female	8(10%)
Level of education	
Not educated	24(30%)
Primary education	37(46.3%)
Secondary education	10(12.5%)
College/University	9(11.3%)

During the study period of seven months, the age distributions were; less than 29 yrs 18(22.5%), 30 to 59 yrs 27(33.8%) and more than 60 yrs 35(43.8%). Most of the patients with urological emergencies were more than 60 yrs.

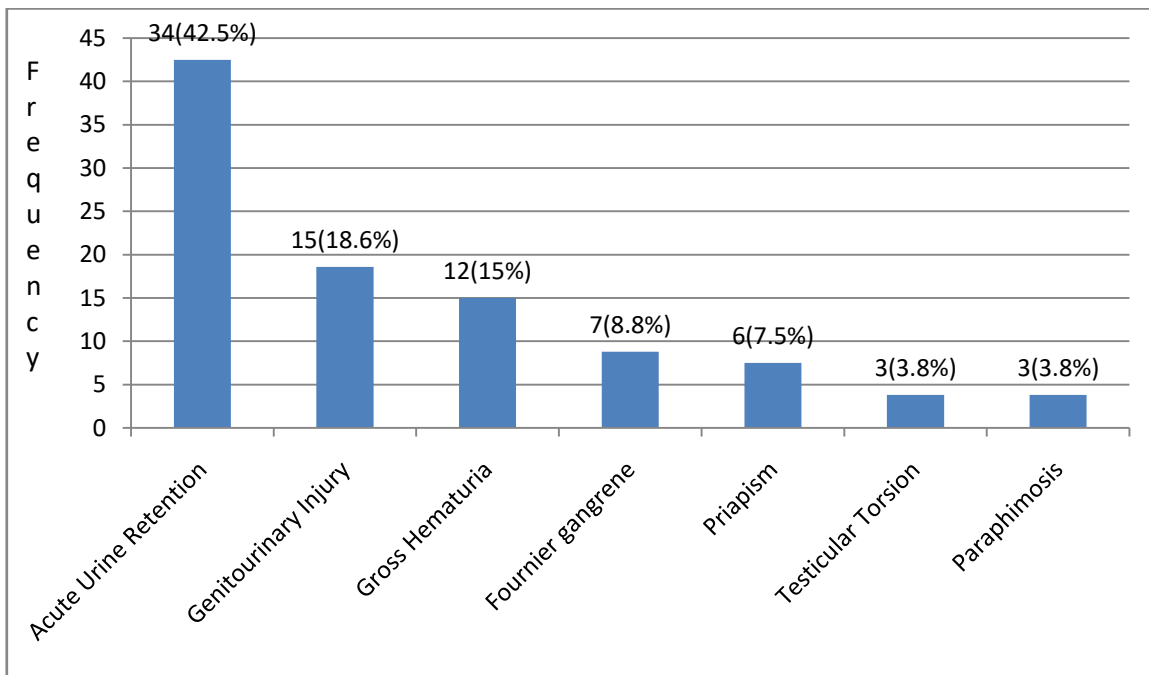
Distributions of different Urological emergencies due to sex were: 72(90%) male and 8(10%) female. Most of the patients were male.

Levels of education of patients with a different type of urological emergencies are; primary education 37(46.3%), not educated 24(30%), secondary education 10(12.5%) and college/university 9(11.3%). Most of the patients with urological emergencies had Primary education.

3.2 Proportion of different types of urological emergencies compared to other urological conditions seen during a study period of seven months at MNH

During this period of the seven-month total number of patients admitted with other urological conditions were 1752, and the proportion of urological emergencies was 4.6%.

Figure 1: Proportion of 80 patients with different types of urological emergencies at MNH.



Different types of urological emergencies.

Figure number one above shows the proportion of different types of urological emergencies at MNH, divided into three groups.

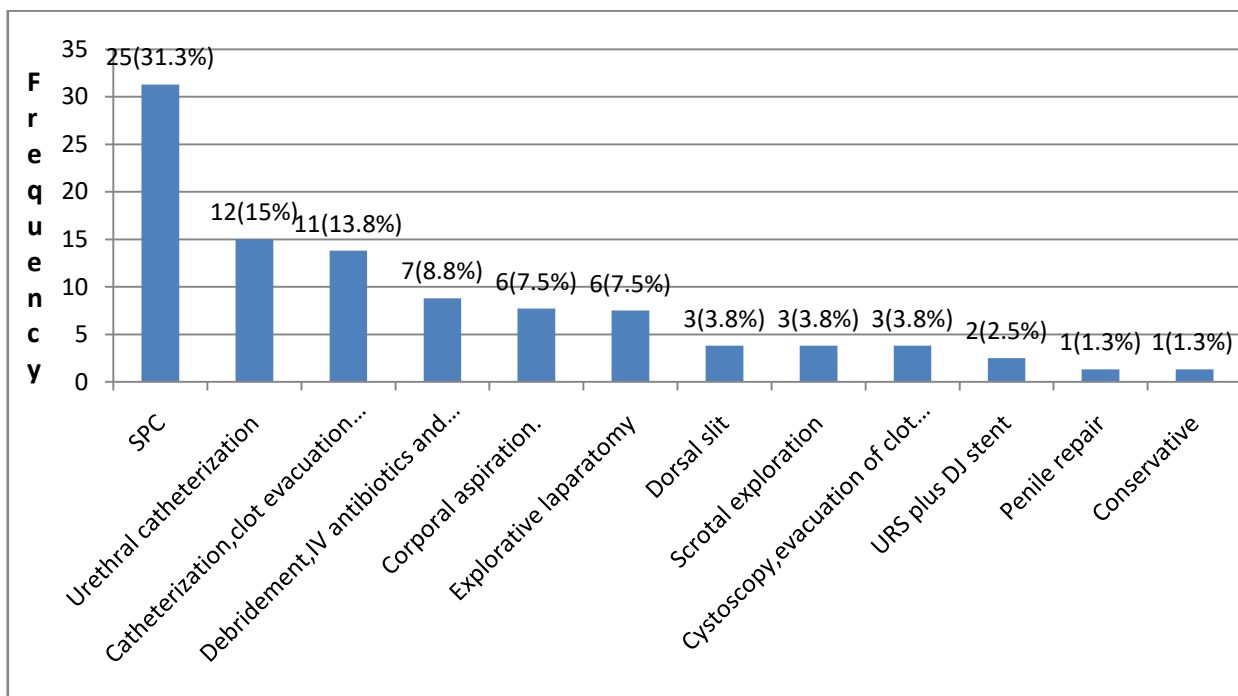
The first group is tube related urological emergencies, whereby the most common urological emergencies were acute urine retention 34(42.5%) and Gross haematuria with clot retention 12(15%).

The second group is urological injury emergencies consist of Genitourinary injury 15(18.6%).

The third group consist of genital related emergencies, which consist of Fournier's gangrene 7(8.8%), Priapism 6(7.5%), Testicular torsion 3(3.8%) and paraphimosis 3(3.8%).

3.3 Immediate treatments of different type's urological emergencies during the study period of seven months at MNH.

Figure 2: Immediate treatments of 80 patients with different types of urological emergencies.



Immediate treatments of different types of urological emergencies

Figure two above shows the immediate treatment' of different types of urological emergencies at MNH divided into five groups.

First group: tube insertion consists of SPC 25(31.3%) and urethral catheterization 12 (15%) for patients with AUR, urethral catheterization, clot evacuation and irrigation with normal saline 11 (13.8%) for patients with Gross haematuria with clot retention, and patient with Genitourinary injury urethral catheterization was done 3(3.8%).

The second group: endoscopy, consists of cystoscopy, clot evacuation and irrigation with normal saline 3(3.8%) for patients with Gross haematuria with clot retention; also, patients with Genitourinary injury were treated by URS plus DJ stent 2(2.5%).

Third group: open surgery but non-laparotomy consists of debridement of gangrenous part, IV antibiotics and IV fluid 7(8.8%) for patients with Fournier's gangrene; scrotal explorations were done 3(3.8%) for patients with testicular torsion, 3(3.8%) dorsal slit was done for patients with Paraphimosis, and patients with Priapism corporal aspiration were done 6(7.5%).

Forth group: open surgery laparotomy, 6(7.5%) of patients with genitourinary injury were managed by explorative laparotomy.

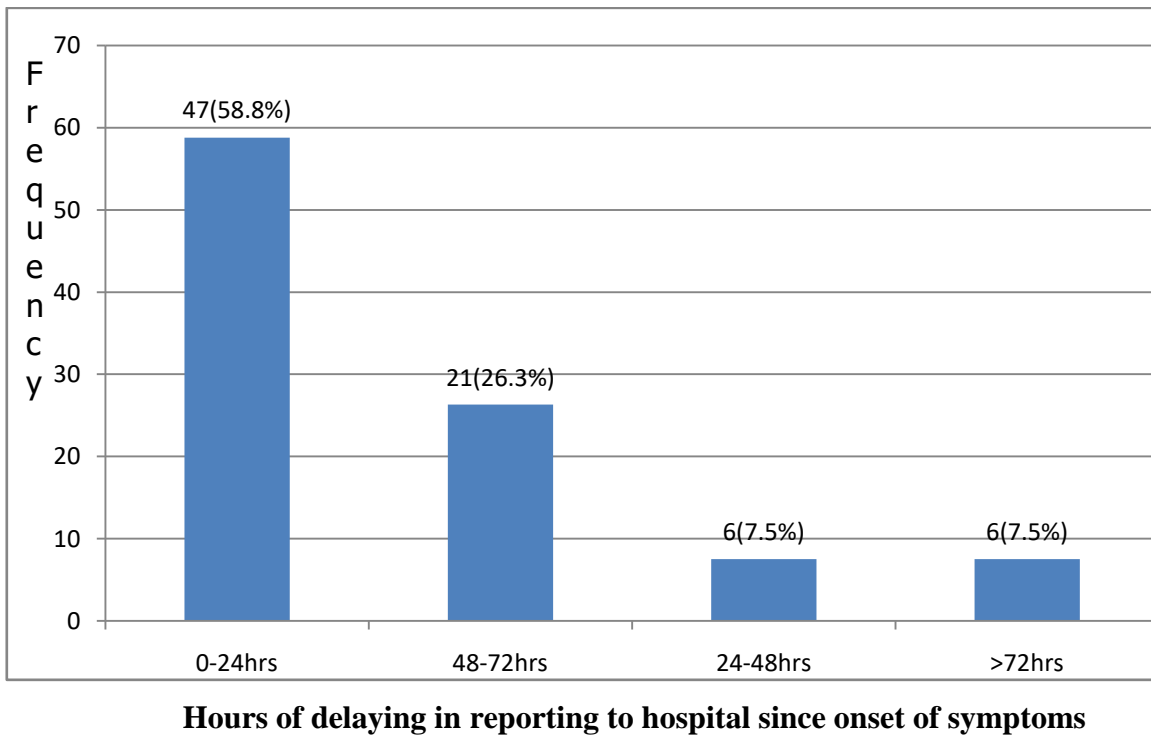
Fifth group: medical or conservative treatment, 1(1.3%) of a patient with genitourinary injury was treated conservatively.

3.4 Management outcome of patients with different type of urological emergencies during the study period of seven months at MNH

During the research study, all patients with different types of urological emergencies were admitted to ward 80(100%); I recruited all admitted patients with urological emergencies during the recruitment procedure.

3.4.1 Hours of delay in reporting to hospital since the onset of symptoms during the study period of seven months at MNH.

Figure 3: Hours of delay in reporting to hospital since onset of symptoms of 80 patients seen with different types of urological emergencies.

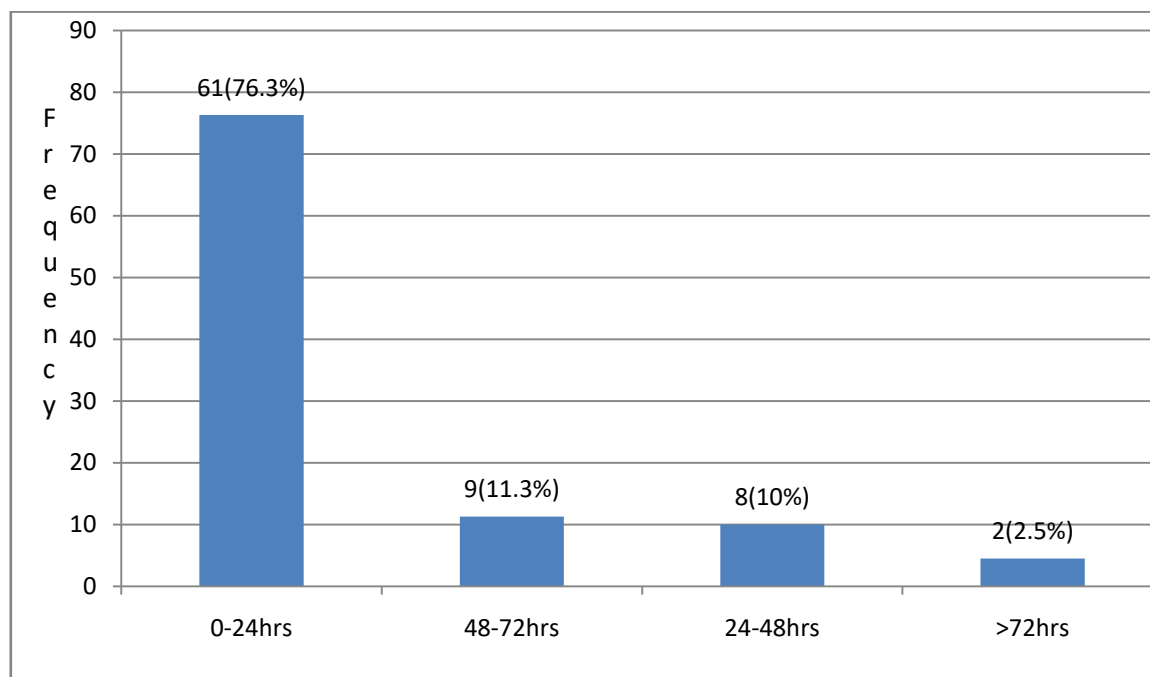


The patients with Urological emergencies who delayed reporting to the hospital since the onset of symptoms were: less than 24 hrs were 47(58.8%), 48 to 72 hrs were 21(26.3%), 24 to 48 hrs were 6(7.5%), and more than 72 hrs were 6(7.5%).

The mean time of delay in arrival at MNH since the onset of symptoms was 69.9 hours, whereby the minimum time was 1 hour and maximum time was 720 hours, and standard deviation of 104.5.

3.4.2 Hours of delay in receiving emergency treatment of patients with different types of urological emergencies after arrival at MNH during the study period of 7 months.

Figure 4: Hours of delay in receiving emergency treatment of 80 patients with different types of urological emergencies after arrival at MNH.



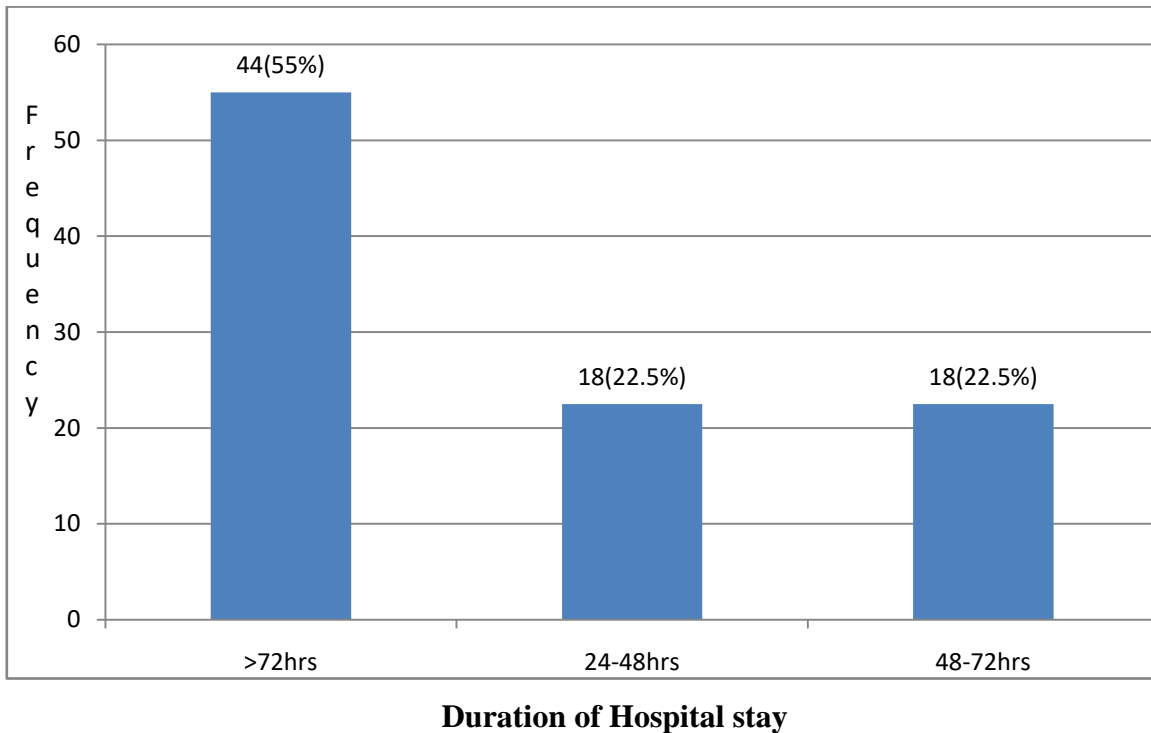
Hours of delaying in receiving emergency treatment

Figure number 4 above showed that most patients with Urological emergencies received treatment services after arrival at MNH within 24hrs 61(76.3%), 48 to 72hrs 9(11.3%), 24 to 48 hrs 8(10%), more than 72hrs 2(2.5%). Seventy-six point three per cent of patients with a different type of urological emergencies received emergency treatment within 24 hrs after arrival at MNH.

The mean time of delay in receiving emergency treatment after arrival at MNH was 11.5 hours, whereby the minimum time was 0.5 hour and maximum time was 240 hours with a standard deviation of 30.9.

3.4.3 Duration of hospital stay of patients after being admitted into the ward during the study period of 7 month.

Figure 5: Duration of hospital stay of 80 patients with different types of urological emergencies.



Patients with different types of urological emergencies after being admitted into the ward most stayed more than 72 hrs 44 (55%), followed by 24 to 48 hrs 18 (22.5%) and 48 to 72 hrs 18 (22.5%). Among patients who stayed in the ward for an extended period were patients with Fournier's gangrene and genitourinary injury The mean time duration of hospital stay was 134.4 hours, whereby the minimum time was 24hours, and maximum time was 720 hours, and the standard deviation of 140.8.

3.4.4 Treatment outcome of 80 patients with different types of Urological emergencies after being admitted in the ward during the study period of 7 months.

Treatment outcome of patients who were attended at MNH with urological emergencies was successful 75(93.8%), mortality was 3(3.78%), and complication rate was 2(2.43%). One patient with bilateral ureteric injury and two patients with Fournier's gangrene died. Also, two patients with testicular torsion had gangrene of the affected testes

3.5 Causes of different types of urological emergencies during the study period of 7 months at MNH

Table 2: Causes of different types of urological emergencies at MNH

Causes of different type of urological emergencies	Percentage
Acute urine retention	
BPH	15(44.1%)
Urethral stricture	12(35.3%)
Iatrogenic urethral injury	4(11.8%)
Neurogenic bladder	2(5.9%)
Urethral tumour	1(2.9%)
Genitourinary injury	
Trauma	7(46.7%)
Iatrogenic injury	6(40.0%)
Improper catheterization	2(13.3%)
Gross haematuria with clot retention	
Bleeding prostate	6(50%)
Bladder tumour	5(41.7%)
Upper urothelial tumour	1(8.3%)
Fournier's gangrene	
Diabetes mellitus	3(42.9%)
Spinal cord injury	2(28.6%)
HIV	1(14.3%)
Trauma	1(14.3%)
Priapism	
Sickle cell disease	5(83.3%)
Drug induced	1(16.7%)

The following were causes of AUR in 34 patients: BPH 15 (44.1%), urethral stricture 12(35.3%), Iatrogenic urethral injury 4(11.8%), neurogenic bladder 2(5.9%) and urethral tumour 1(2.9%). Among the common causes of acute urine retention were BPH and urethral stricture.

Fifteen patients with Genitourinary injury causes were: Iatrogenic injury 8(53.3%) and genitourinary trauma 7 (46.7%). Thus, iatrogenic injury was among the commonest causes of genitourinary injury.

Patients with Gross haematuria with clot retention causes were: bleeding prostate 6(50%), bladder tumor 5(41.7%) and upper tract urothelial tumor 1(8.3%). Among the common causes of gross haematuria with clot retention were bleeding prostate and bladder tumor.

Among seven patients with Fournier's gangrene causes were; diabetes mellitus 3(42.9%), spinal cord injuries 2(28.6%), HIV 1 (14.3%) and trauma 1(14.3%). Diabetes mellitus was among the common causes of Fournier's gangrene.

Six patients with Priapism causes were: SCD 5(83.3%) and drug induced 1(16.7%). Thus, the most common cause of Priapism at MNH was SCD.

CHAPTER FOUR

4.0 DISCUSSION

During the study period of the seven-month total number of patients admitted with other urological condition were 1752 and proportion of urological emergencies was 4.6%. The proportion of Urological emergencies at MNH were low compare with a study which ShyamTalreja in India did which was 27.1%, and the total number of patients admitted in the urology department was 11139[3]. The proportion in India was high because admitted cases were 11139.

Acute urine retention was among the most common urological emergencies at MNH with a proportion of 42.5%, but Shymal Talreja in India in 2015 showed that the proportion was 14.7% [5]. The proportion of AUR at MNH was high because most of the patient's has urethral stricture and BPH

The genitourinary injury was among the Urological emergencies at MNH with a proportion of 18.6% it's similar to the study done by Federico Coccolin et al. 2019 which was 10-20% [34]. The proportion was similar but underlying causes at MNH were trauma and iatrogenic injury but Federico Coccolin he did not report on underlying cause.

Gross haematuria with clot retention was the third Urological emergencies at MNH with a proportion of 15%; this proportion was high compared to the study done by Vinesh Appadura 2013 was 3-6% [38]. Proportion at MNH was high probable because most of the causes of Gross haematuria with clot retention were bleeding prostate and bladder tumour.

The proportion of Fournier's gangrene at MNH was 8.8%; this proportion was similar to the study done by CJ Okeke, which was 8.6% [19].CJ Okeke reported that most patients use traditional medicine initially and present at a late stage with florid of disease. At MNH the underlying causes of Fournier's gangrene were: diabetes mellitus, spinal cord injury, HIV and trauma but CJ Okeke he didn't report anything on underlying causes of Fournier's gangrene.

The proportion of Priapism at MNH was low compared to the study done in Lagos, Nigeria by Adewuni Adediran 2013 of 39.1% compared to MNH of 7.5% [24]. However, the proportion of Priapism in Nigeria was high because of large number of patients with SCD. The prevalence of SCD in Nigeria was 9 – 16% study done by Agatha Nkiruka David et al 2018 [45] and prevalence of SCD in Tanzania was 3.9% study done by Luke Eastburg 2021 march[46].

Ten to fifteen percent of children who present with acute scrotal pain have testicular torsion, study done by Laher A et al in USA 2020 [20], but the Proportion of Testicular torsion was 3.8% at MNH. Thus, the proportion of Testicular Torsion at MNH was low probably there could be missed testicular torsion.

The proportion of Paraphimosis at MNH was high, 3.8%, compared to the study done by SW Leslie 2020, which showed 0.2% -1% [31]. Thus, at MNH, proportion seems to be high probably because of iatrogenic induced during urethral catheterization.

Suprapubic cystostomy and urethral catheterization were among the immediate treatment of patients with AUR by 31.3% and 15%; a study done by CJ Okeke in Nigeria 2020 shows urethral catheterization was 52.1% and suprapubic cystostomy was 11.6% [19]. At MNH, Suprapubic cystostomy was the most performed procedure while comparing with CJ Okeke, the most common procedure was urethral catheterization, at MNH number of patients with urethral stricture was high; therefore, immediate treatment was suprapubic cystostomy, but for CJ Okeke, BPH was more frequent causes of acute urine retention.

Wound debridement, IV antibiotics and IV fluid were among the immediate treatments for the patient with Fournier's gangrene at MNH by 8.8%; this was similar to the study done by CJ Okeke et al. shows 8.6% [19]. However, the number of patients with Fournier's gangrene were high, 23 in the CJ Okeke study but at MNH were 5.

Immediate treatments of patients with testicular Torsion at MNH were scrotal exploration, orchiectomy of the gangrenous testes and fixation of contralateral testes by 3.8%. A study done by Obadia Nyongole at KCMC shows that 55.4% of patient with testicular torsion orchiectomy of the affected testes and fixation of unaffected testes were done [21]. The proportion of orchiectomy and fixation of contralateral testes at MNH were low compare to KCMC because at KCM number of patients with testicular torsion was 74 but at MNH were 3.

Patients with Genitourinary injury immediate treatments were: laparotomy 7.5% for kidney, ureter and bladder injury, 2.5% URS plus DJ stent for iatrogenic ureteric injury, and 3.8% urethral catheterization for blunt injury of the urinary bladder, 2.6% SPC for the patients with urethral injury and 1.3% conservative for patient with blunt injury of urethra. The study, which was done by N K Dakum 2007, show that SPC was done for 11 patients with urethral injury, laparotomy for 5 patients with ureteric injury and bladder rupture, and 3 patients with blunt injury of urinary bladder urethral catheterization was done [35]. The immediate treatment of patients with genitourinary injury at MNH was similar with N K Dakum study as per guideline.

Patient with Gross haematuria with clot retention immediate treatment at MNH were: urethral catheterization, clot evacuation and irrigation with normal saline 13.8% and cystoscopy, evacuation of clot and irrigation with normal saline 3.8%. A study done by Vinnesh Appadurai 2003 show that patient should be resuscitated, transfused blood when necessary should be encouraged to drink enough fluid to remain hydrated and free drainage of urine should be ensured with or without a urinary catheter in-situ [38]. The cause of the haematuria should be identified and treated [38]. There is no statistical data in this study for comparison, but the same treatment protocols were used at MNH.

The treatment outcome of patients attended at MNH with urological emergencies was successful by 75(93.8%). For those patients whose medical outcome was not successful, one patient with bilateral ureteric injury and two patients with Fournier's gangrene died, and two patients with testicular torsion ended up with gangrene of the affected testes, the mortality rate

was 3.75%, and complication rate was 2.45%. There are no research paper on the medical outcome of urological emergencies.

Patients with urological emergencies, 58.8% were seen after the onset of symptoms within 24 hrs and 7.5% delay on arrival to the hospital after 72hrs. Patients who delayed reporting to the hospital after 72 hrs are those with Fournier's gangrene and iatrogenic ureteric injury but patient with AUR, testicular torsion, trauma patients and gross haematuria were seen within 24hrs because of pain, unable to pass urine and haematuria. A study done by P Wester 1999 shows that the median times for patient to arrive at the hospital since the onset of emergency symptoms was 7.5 hrs probable due to good infrastructure and an adequate number of the ambulance [40].

Seventy-six per cent of patients with different types of urological emergencies received emergency treatment within 24 hrs after arrival at MNH, and 2.5% of the patient received emergency treatment after 72hrs. Patients who delayed receiving specific treatment after arrival at MNH were clinically unstable, electrolyte derangement, impaired renal function, and after being stabilized, specific treatment was initiated. Sometimes, admitting team was not timely consulted even when the patient was clinically stable. A study done by DP O Leary 2014 in Ireland shows that one-third of patient waited longer than 24hrs for emergency surgery [41].

After being admitted into the wards patients with different type's urological emergencies, 55% stay in the ward for more than 72 hrs and 22.5% for less than 48hrs. Patients who stayed in the ward for an extended period were patient with Fournier's gangrene and genitourinary injury because they were clinically unstable, septic, needing serial debridement and close follow up. Studies done by Felix R Montes in 2019 showed that duration of hospital stay depend on the patient's type of surgery and stability [42].

The most common causes of AUR at MNH were BPH 44.1% and urethral stricture 35.3%, but a study done by E.M.T.Yenli 2015 showed that 58.1% BPH and 14.4% urethral stricture [43]. At MNH, a small number of patients with BPH but a significant number of patients with urethral stricture caused AUR.

At MNH, the causes of genitourinary injury were: iatrogenic injury 53.3% and genitourinary trauma 46.7%. A study done by CJ Okeke 2020 shows that 100% of women with GUI were due to iatrogenic injury, and 66.7% of men were due to blunt injury [19]. At MNH, the most common cause of genitourinary injury was iatrogenic injury, were by ureteric injury was due to iatrogenic injury and urethral injury due to improper catheterization.

Bleeding prostates were among the most common cause of Gross haematuria, with clot retention at MNH by 50% then followed by 41.7% bladder tumour. A study done by Ofer N Gofrit showed that 60% bleeding prostates, 38.5% bladder cancer and 23% urinary tract infection [44]. The proportion of bleeding prostates in the study done by Ofer N Gofrit was higher than MNH, and at MNH number of patients with bladder cancer was higher.

Among the causes of Fournier's gangrene at MNH were: diabetes mellitus 42.9% and patients with spinal cord injury 14.4%, study done by Phillip L Chalya 2015 in Bugando shows that 16.7% were due to diabetes mellitus and 11.3% HIV positive [30]. Diabetes mellitus was the most common cause of Fournier's gangrene at MNH probably due to neuropathy and frequent infection.

Sickle cell disease was the most common cause of Priapism at MNH by 83.3%, followed by 16.7% drug-induced. A study done by Henry P.Gottsch in the USA 2012 show that 38% were drug-induced, 19% neurogenic priapism and 18% SCD [26]. In a study done by Henry P.Gottsch, most patients with Priapism were due to substance abuse but at MNH patients with priapism due to drug induced were due to further evaluation of erectile dysfunction.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Acute urine retention and genitourinary injury were the commonest urological emergencies at MNH.

The immediate treatments of patients with urological emergencies at MNH were Urethral catheterization and suprapubic cystostomy.

Treatment outcome of patients with Urological emergencies attended at MNH were mostly successful, with low mortality and complication rate.

There was a significant delay in reporting to the hospital and starting definitive treatment once arriving at the hospital.

5.2 Recommendation

1. Further studies on the magnitude of urological emergencies but should include inpatients and outpatients.
2. Immediate treatments for patients with different forms of urological emergencies should be initiated by admitting team, if unsussfull urology team should be consulted for immediate interventions.
3. Patients with different forms of urological emergencies should not delay in reporting to the hospital since the onset of symptoms and after arrival to the hospital immediate treatment should be expedited.
4. The public should be educated on the causes of different forms of urological emergencies.

5.3 Study limitation

1. Result cannot be extrapolated to other hospitals.
2. The study did not recruit outpatient; therefore, other outpatient emergencies have been missed.

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APPENDICES

Appendix I: Consent Form (English Version)

TITLE Magnitude of urological emergencies and immediate management at Muhimbili National Hospital

Greetings Sir,

I am Dr Andrew Gervas Urassa, a resident in the Department of general surgery taking master of medicine in Urology. I am researching the magnitude of different urological emergencies and immediate management at MNH.

Aim of the study

This study aims to assess the magnitude, associated factors, types, immediate management and medical outcome of urological emergencies condition at MNH.

Participants

All patients with different type's urological emergencies admitted to the wards, the emergency department at MNH and MOI.

Risks:

There are no risks associated with being involved in the study.

The study will provide data about the magnitude, immediate management, treatment outcome, and causes of different types of urological emergencies that can be used to provide information for further surgical management, improving health care services for patients with urological emergencies.

Confidentiality:

All information collected from patients will not be revealed to anybody except attending doctors and the patient himself.

Costs:

No payment will be requested from you as a fee to participate in the study

Voluntary participation and rights to withdraw

Your participation is voluntary, and you have the right to discontinue participating in the study at any time. Your decision will not affect in any way your right to care and treatment.

Person to contact in case of questions or any clarifications regarding this research:

In case of any information about your rights as a participant in this study, please contact:

Dr Bruno Sunguya

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I have read/been told of the contents of this form and understood its meaning. I agree to participate in this study.

Signature (Participant) Date

Signature (Researcher) Date

Appendix II: Consent Form (Kiswahili Version)

Fomu ya ridhaa katika utafiti kuhusu magonjwa ya dharura katika mfumo wa mkojo katika Hospitali ya Taifa Muhimbili.

Salaam,

Ndugu, habari za wakati huu!

Utambulisho

Jina langu ni Dkt. Andrew Gervas Urassa

Mwanafunzi wa shahada ya uzamili ya udaktari wa magonjwa ya mfumo wa mkojo na uzazi kwa wanaume na wanawake katika Chuo Kikuu cha Muhimbili. Ninafanya utafiti kuhusu magonjwa yadharura ya mfumo wa mkojo na matibabu yake.

Lengo la utafiti

Lengo la utafiti huu ni kuangalia ukubwa na aina mbalimbali za magonjwa ya dharura ya mfumo wa mkojo katika Hospitali ya Taifa Muimbili.

Utafiti huu unamhusu nani?

Utafiti huu unamhusu mtu yoyote atakaye hiari huduma ya dharura. Mshiriki atahojiwa maswali kadhaa kuhusiana na maisha yake na ugonjwa wake.

Faida na athari

Utafiti huu hauna athari yoyote Kwa mshiriki. Mshiriki ataelimishwa kuhusu ugonjwa husika. Mshiriki hatapendelewa ataudumiwa kama wamongjwa wengine na hatalipwa.

Usiri wa taarifa

Taarifa tutakazochukua zitatumizwa kwa usiri. Taarifa hizo zitatumika tu kwa ajili ya utafiti huu.

Gharama ya kushiriki katika utafiti huu.

Mshiriki hataingia gharama yoyote ili kushiriki katika utafiti huu.

Kushiriki kwa hiari na haki ya kujitoa.

Kushiriki katika utafiti huu ni kwa hiari na unaweza kujitoa wakati wowote. Vyovyote vile uamuzi wako hautaathiri mwenendo wa matibabu yako.

Ukiwa na maswali au shida wakati wowote kuhusiana na utafiti huu wasiliana

Na wafuatao:

Dkt Andrew Gervas Urassa -0713706803 Mtafiti Mkuu, au Prof Muhsin M Aboud/DrKaal 0713292617, mkufunzi katika chuo kikuu cha Afya na sayansi shirikishi Muhimbili na Msimamizi wa utafiti huu.

Iwapo utakuwa na swali lolote kuhusu haki zako kama mshiriki katika utafiti huu wasiliana na:

Dr. Joyce R Masalu

Mkurugenzi wa Utafiti na Machapisho

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Mimi Nimeelezwa/nimesoma yaliyomo katika

Fomu hii na nimeelewa maana yake. Nakubali kushiriki katika utafiti huu.

Sahihi..... (Mshiriki) Tarehe.....

Sahihi (Mtafiti) Tarehe

Appendix III: Data Collection Tool

PATIENT'S DATA SHEET.

QN1. Patient's file number-----

QN2. Age of the patient-----

QN3. Sex-----

QN4. Address-----

QN5. Patient's or closes relative's phone number -----

QN6. Level of education

(a) Not educated

(b) Primary

(c) Secondary

(d) College/ University

QN7 Clinical presentations of urological emergencies

(a) Difficult in passing urine

(b) Lower abdominal pain

(c) Lower abdominal distension

(d) Severe acute scrotal pain

(e) Haematuria

(f) Scrotal swelling

(g) Gangrene of scrotum, perineum and penile skin (h) Painful, persistent erection of the penis

(i) Severe penile pain with retracted foreskin (j) others specify-----

QN8 Types of Urological emergencies

a) Acute urine retention.

b) Priapism.

c) Gross haematuria with clot retention.

d) Fournier gangrene.

e) Testicular torsion.

f) Penile fracture

g) Obstructive pyelonephritis.

h) Genitourinary injury.

i) Others, specify.....

QN9 Laboratory investigations

- (a) FBP (b)RBG (c) Creatinine and Urea
- (d) HIV Serology (e) PSA
- (f)Others specify-----

QN10 Imaging modality

- (a)Abdominal pelvic ultrasound (b) Doppler ultrasound
- (c)Abdominal pelvic CT scan (d) Urethrogram
- (f) Others specify-----

QN11 Associated factors of Urological emergencies

- (a)BPH (b) Urethral stricture (c) Diabetes mellitus
- (d) HIV (e) Sickle cell (f) Genital urinary trauma
- (g) Sexual intercourse (h) Urothelial tumor (i) Neurogenic bladder
- (i)Others, specify.....

QN12 Immediate treatments of urological emergencies

- (a) Urethral catheterization
- (b) Suprapubic catheterization
- (c) Orchidoplex
- (d) Scrotal debridement
- (e) IV antibiotics
- (f) IV fluid
- (g) Corporal aspiration
- (h) Shunt
- (i) Explorative laparatomy
- (j) Penile repair.
- (k) Others specify-----

QN13 Management outcome of patients with urological emergencies

- (a) Inpatient
- (b) Outpatient
- (c) Delay in reporting (hours) from starting symptom to arrival at the hospital

- (d) Delay in treatment (hours) from arrival to hospital to treatment time
- (e) Treatment outcome
 - 1 Successfully
 - 2 Not successfully
 - 3 complications
- (f) Duration of hospital stay

QN14 Signature of patient agree to participate in the study and consent -----