

INDICATIONS FOR AND COMPLICATIONS OF NEPHRECTOMY CASES AT
SAINT PAULS HOSPITAL MILLENNIUM MEDICAL COLLEGE ADDIS ABABA,
ETHIOPIA

BY

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ABBREVIATIONS

RCC	Renal Cell Carcinoma
TCC	Transitional Cell Carcinoma
XGP	Xanthogranulomatous Pyelonephritis
U/S	Ultrasonography
IVU	Intravenous Urogram
RGP	Retrograde Pyelogram
CT	Computerized Tomography
U.T	Urinary Tract
SPHMMC	saint paul hospital millennium medical college
LUTS	Lower urinary tract symptoms
BLGSH	Black lion generalized specialized hospital
UPJO	Uretero-pelvic junction obstruction

Executive summary of research result

BACKGROUND: Nephrectomy is a standard urological procedure for malignancy of kidneys and upper urinary tract therapeutic, and for damaged kidneys with little or no contribution to the overall renal function.

OBJECTIVE: The objective of the study is to determine the indications for and complications of nephrectomy cases in the Saint Paul's Hospital Millennium Medical College.

METHODS: A cross-sectional hospital based study was employed at St. Paul's Hospital Millennium Medical College.

Data was collected from charts retrieved from operation logbooks and pretested questionnaire was used.

All charts of patients for whom nephrectomy done at SPHMMC during the study period which fulfill inclusion criteria were included in the study.

Data obtained was sorted, organized, analysed using SPSS version 21.00 software.

Independent variables include Age, Sex, clinical presentations whereas dependent variables includes indications and postoperative complications.

RESULTS

The total number of nephrectomies performed during the study period was 82. Out of which seventy one charts of patients with nephrectomies were included in this study.

There were charts of 41 (57.7%) males and 30 (42.3%) females with the male to female ratio of 1.3:1. The majority of patients for whom nephrectomy done were between the ages of 15- 30 (32.4%). The clinical presentations of patients for whom nephrectomy was done: flank pain, pyrexia and hematuria (31%), flank pain, pyrexia, LUTS and hematuria (19.7%).

Nephrectomy performed for benign conditions (66.2 %) was the leading followed by malignant conditions (33.8 %). Complications of nephrectomy varied according to the indication, being higher in patients with malignancies (11.1%). Superficial surgical site infection was the leading complication among study subjects (8.5%) followed by hospital acquired pneumonia (4.2%).

CONCULION:

There is a higher rate of nephrectomy performed for benign conditions in SPHMMC (66.2%). Late presenting obstructive uropathy due to PUJO and stone causing loss of renal function was common in our study. Taking results of the studies done in other developing countries, we can conclude that still benign conditions of the kidney are the leading reasons for nephrectomy in developing countries.

RECOMMENDATION:

This study suggests the need of dire urgency to provide better health services at basic level and increase in awareness by education to decrease the rate of nephrectomy for preventable conditions like renal stone disease and early intervention for patients with UPJO. We also recommend further study on postoperative conditions and complications of the procedure on the patients who underwent nephrectomy.

CHAPTER ONE

1 INTRODUCTION

1.1 BACKGROUND

The kidneys, like any other human body organ, can be involved in various pathological processes, some of which may require its surgical removal (Nephrectomy).

Nephrectomy is a standard therapeutic urological procedure for malignancy of kidneys and upper urinary tract, and for damaged kidneys with little or no contribution to the overall renal function. The causes of loss of renal function, which lead to nephrectomy differ between the pediatric and adult patients population.(1) Vesicoureteric reflux is the leading cause of nephrectomy in children.(2) Some reports list malignancy as the leading cause in adults,(3)while other implicate the sequelae of obstruction, collectively known as obstructive nephropathy, as the main culprit.(4)

Many complications are associated with nephrectomy and nephrectomy for malignant disease had a significantly higher rate of complications than operations for benign conditions

The number of nephrectomies for neoplastic lesions has increased. This is consistent with the accepted policy that surgery is the only effective treatment for renal cancers.(4) Since 1984, radical nephrectomy has become the standard operation for renal cell cancer. In the period between 1974 and 1984 patients with renal cell carcinoma were treated by either simple or radical nephrectomy

Wider use of ultrasonography and computed tomography has contributed to a better detection rate at a stage when surgery has a realistic hope of cure, and could explain the increase in numbers. The advent of modern antibiotics and the advances in the methods of investigations and the aggressive treatment of acute pyelonephritis and the causative condition e.g. vesico-ureteric reflux lead to small decline in the number of nephrectomized pyelonephritic kidneys.(4)

In general, In developed countries where facilities exist for early diagnosis, minimally invasive and laparoscopic nephrectomy is the gold standard as opposed to what is obtainable in developing countries where late presentations with advanced disease and complications, thus necessitating open nephrectomy.

1.2 Statement of the problem

Indications for open nephrectomy still exist especially in the developing countries where late presentation and advanced disease is the norm.

Some studies showed renal stone related nephrectomy account for 53%. Nephrectomy cases represent a significant part of the urology surgical workload. The complication rate of nephrectomy cases varies with age; being the highest at the extremes of age. (3)

It also varies according to indication, duration of onset of the symptoms, presence or absence of complications prior to surgical intervention; for example, the complication rate of nephrectomy of is 4.1 % according to study in BLGSH. (5)

The situation was considered to be worse in developing countries where health facilities were scarce and health education was lacking, that many patients present late to hospitals after trials with local remedies were exhausted. The pattern of the disease was found to vary in different parts of the world and even in different areas in the same country, due to local factors.

The indications for nephrectomy in any population will vary according to age, sex and race, as well as genetic and environmental factors. The procedure performed and findings obtained also vary according the indications for nephrectomy.(1)

In Ethiopia, there is a single study regarding the indications for and complications of nephrectomy.(5) Thus, this study was conducted with the aim of assessing the indications for and complications of nephrectomy in SPHMMC and comparing it with the study in the country, Sub Saharan Africa and also the developed countries.

1.3 SIGNIFICANCE OF THE STUDY

In Ethiopia, there is a single study about to determine indication for and complications of nephrectomy, in SPHMMC there is no published data of the topic under the study. Late presenting obstructive uropathy due to stone causing loss of renal function is common in developing countries.

Benign conditions of the kidney are still the leading reasons for nephrectomy in developing countries, even though most of nephrectomy is performed for malignant disease in developed countries. So it will be better to provide better health services at a basic level and increasing awareness by education to decrease the rate of nephrectomy for preventable conditions, like renal stone disease. Therefore, this study partly fills the gap.

This study is also useful to put base line information for clinicians caring and treating patients with nephrectomy; as well as to forward recommendations to initiate other investigators to work further on the same and/or other related issues.

CHAPTER 2 LITERATURE REVIEW

A retrospective cross-sectional analysis of indication for nephrectomy from jan 2014 to 2015 at tertiary care hospital in pakistan, 80 patients with non-functional kidney, who underwent simple nephrectomy

Patients of any age and gender were included. Stone disease was the most common pathology responsible for non-functional kidney diagnosed in 40 (50%) patients, out of which 35 (43.8%) were with renal stones and 5 (6.2%) with ureteric stones.(1) The 2nd most common pathology was Uretero-pelvic junction obstruction (UPJO) presented in 25 (31.2%) patients.(1)

A five years retrospective cross-sectional study to at nishtar medical college multan ,Pakistan from January 2001 to December 2005 were studied with regards clinical presentation, indication for nephrectomy, post-operative complications and mortality. The indications for nephrectomy were divided into benign and malignant conditions.(2)

Out of 154 nephrectomies, 118 (76.6%) were performed for benign condition and 36 (23%) for malignant etiology. (2)

In the benign group, majority (i.e. 53.3%) of the patients had kidneys removed due to renal stone. Other conditions in this group included chronic pyelonephritis (20%), neglected ureteropelvic junction obstruction (16%), renal tuberculosis (7.6%) and iatrogenic (2.5%). (2) Thirty-six (23%) patients had nephrectomy for malignant conditions i.e. renal cell carcinoma. Malignant tumors were more common in males while benign conditions necessitating nephrectomy were predominant in female patients. Patients with benign conditions were much younger (mean age 32 years) than patients in malignant group (mean age 52.8 years). (2)

Nephrectomy for malignant disease had a higher rate of complications (13.8%) than for benign conditions (7.6%). (2)

There was study which reviewed all patients that had open nephrectomy between January 2008 to December 2012 in the specialist hospital Damaturu and the University of Maiduguri Teaching Hospital North Eastern Nigeria, A total of 81 patients were analyzed age ranged from 6 months to 79 years with mean of 33.5years for benign lesions and 48.7years for malignant conditions, and peak age group of 30 – 39 years accounting for 19.75%, and a male to female ratio of 1.3:1. (3)

The main presenting features were abdominal/loin pain in 80.25% patients and anemia in 79.01%. Histology revealed renal cell carcinoma in 28.40% and gunshot injuries in 16.05%. The postoperative complications were surgical site wound infections in 8.64%, and acute renal failure in 4.94 %.(3)

There was also a descriptive retrospective study performed in 70 adult Sudanese patients who underwent nephrectomy at Soba University Hospital and Ibn Sina Specialized Hospital, in the period from January 2000 to October, 2003.(4)

The mean age of the study group was 46.1 years, however, patients with benign diseases were younger than those with malignant tumours. (4)

The male to female ratio was 1.3:1 and there was slight predominance of right-sided lesions.(4) Loin pain was the leading presenting feature with only few cases presenting with hematuria and some with loin mass.(4)

The leading indication for nephrectomy was chronic obstruction culminating in end-stage pyelonephritis (45.7%), followed by RCC in 41.5 %.(4)

Sixty one percent of the cases with obstruction had associated upper urinary tract stones.(4) Complications were encountered in 12.7% of the patients.(4) The most common complication was bleeding, which occurred in 55.6%, however, nephrectomy for malignant diseases had higher rate of complications (88.9%) than for benign conditions (11.1%). The overall mortality rate was 1.4%, but was almost nil in the absence of malignancy. (4)

Obstructive uropathy was the main cause of nephrectomy with urolithiasis implicated in more than half of the cases of obstruction. (4)

In Ethiopia, there was a two years retrospective analysis of patients who underwent nephrectomy at Tikur Anbessa hospital from September 2009 to August 2011. (5)

Medical records of patients who underwent nephrectomy during the two years period were studied by using a preset questionnaire with regards to their age, sex, clinical presentation, investigation (laboratory and imaging), indication for nephrectomy and post-operative course.(5)

A total of 73 nephrectomy were performed. Forty (54.8%) patients were males and 33 (45.2%) were females. (5)

The most common presenting symptom was loin pain (100%) followed by haematuria 32(43.5%) and abdominal or flank mass 26 (35.6%). Among patients who underwent nephrectomy, 38(51.2%) had none or poor functioning kidney due to obstructive uropathy.

3.CHAPTER THREE

OBJECTIVES

3.1 General objective

To determine indications for nephrectomy and complications at SPHMMC from January 2016-December 2017.

3.2 Specific objective

- 1 To Identify indications for nephrectomy from January 2016-December 2017.
- 2 To Assess complications of nephrectomy from January 2016-December 2017.
3. To assess correlation between type of surgery and complication rate from January 2016-December 2017.

CHAPTER 4. METHODOLOGY

4.1. Study area and study period

4.1. 1 Study area

The study was conducted in St Paul's hospital millennium medical college (SPHMMC) which is located in Addis Ababa, Ethiopia. St. Paul's hospital is the second big tertiary teaching hospital in AA which serves as a referral center for patients from Addis Ababa and all over the country. SPHMMC is located in the northern part of Addis Ababa.

The college has a total of 1200 professionals and supporting staffs and more than 500 beds of which 110 are dedicated to the general, pediatric and urologic surgery. On average it provides health service for 16000 inpatients and 200,000 outpatients and 5000 surgeries annually with a catchment population of more than five million. It is also a teaching hospital for SPHMMC, AAU and other governmental and private university colleges for both under graduate and post graduate students.

The college has General Surgery, Urology, Orthopaedics, Neurosurgery, plastic surgery, Gynecology/obstetrics, Internal medicine, Pediatrics, Radiology, Ophthalmology, Psychiatry, Pathology, Dermato-venereology, ENT surgery, maxillofacial and Dentistry.

The college has been giving urological surgical care since the beginning of its establishment by general surgeons until 14 years back when Urologic surgery services started to be given by urologic surgeon at the beginning by Cuban urologic surgeon and 3 years later 1 Ethiopian urologic surgeon joined the collage. Now days the treatment providers include five Ethiopian urologic surgeons and one Cuban urologic surgeon with one dedicated ward for urology patients and a total of 21 beds and one out patients. The management options available are open surgical procedures and minimal access surgical service is in its infancy

4.1.2 Study period

The study was conducted from February 1st, 2018-April 30th, 2018

4.2 populations

4.2.1 Source population

All patients who were admitted to urology ward of SPHMMC from January 2015 to December 2017.

4.2.2 study population

All patients who were under gone nephrectomy which fulfil inclusion criteria.

4.3 study design

A hospital based retrospective study was employed.

4.4 Sample size and sample technique

No sampling technique was used.

All charts of patients that fulfil inclusion criteria for whom nephrectomy done at SPHMMC during the study period were included in the study.

4.5 Data collection instrument

Data was collected from the medical records of patient by using structured check list

4.6 Study variable

4.6.1 Dependent variables

Indications

Complications

4.6.2 Independent variables

Age clinical presentations

Sex

4.7 Data collection procedure

4.7.1 Data collection instrument

A prepared checklist developed in English language containing variable to be measured was employed.

Data was collected by primary investigator and medical interns

The collected data was checked for completeness and accuracy on daily bases.

Inclusion criteria – All patients who underwent nephrectomy in the study period

Exclusion criteria – All patients who has incomplete chart, all patients with lost charts and doubtful documents.

4.8 Data analysis, interpretation and dissemination

Immediately after the data collection was completed, data was coded, edited, and entered into computer software of SPSSV 21.00 for analysis. Descriptive analysis was used to describe frequencies and percentages of the variables in the study.

4.9 Data quality control

Before starting the data collection, data collecting format was cross matched with available information on records; then the study questions was rearranged.

The principal investigator had an on going supervision to ensure the quality of data by checking filled check lists for their completeness. The data collectors got informal training how to extract the necessary information from the card by the principal investigator.

After completing the necessary materials and obtaining permission to conduct this study, data was collected by principal investigator and medical interns using the card no in the registration book from patient chart.

4.9 Ethical consideration

After ethical clearance obtained from the college institutional review board (IRB), permission obtained from card room workers of SPHMMC. The purpose of the study was explained to each worker to proceed the data collection from patient registration; data collectors were strictly oriented about patient confidentiality and the patient's name or card number was never used by any means throughout the research.

4.10 Operational definition

Nephrectomy is a surgical procedure for the removal of kidney on patients with severe kidney damage from disease, injury, malignancy or congenital conditions.

Indications: are reasons for which nephrectomy performed for patients with underlying renal problems

Postoperative complication: Complications which has occurred after patients undergone nephrectomy.

4.11 Strengths and Limitations of the study

4.11.1 Strength of the study

The strong side of the study was that it identified indications for and complications of nephrectomy within the study period.

4.11.2 Limitation of the study

The study was limited by shortage of time and the necessary data about a particular patient and sufficient sample size was not found; thereby affecting the generalization of findings to all nephrectomy cases.

CHAPTER5. RESULT

The total number of nephrectomies performed during the study period was 82. Out of which seventy one charts of patients with nephrectomies were included in this study.

5.1 Socio-demographic characteristics of study subjects.

There were charts of 41 (57.7%) males and 30 (42.3%) females with the male to female ratio of 1.3:1. The majority of patients for whom nephrectomy done were between the ages of 15-30 (32.4%) (see table 1).

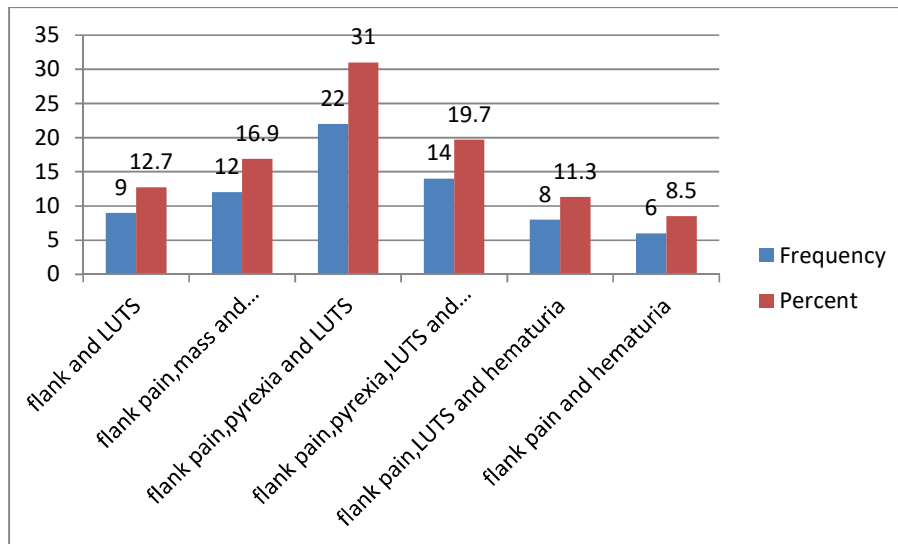
Table-1 Socio-demographic characteristics of subjects with nephrectomy (N=71)

Characteristics		Frequency	%
Age	<15	1	1.4
	15-30	23	32.4
	31-45	20	28.2
	46-60	19	26.8
	>60	8	11.3
Total		71	100.0
Sex	M	41	57.7
	F	30	42.3
Total		71	100.0

5.2 Clinical presentations of study subjects

The clinical presentations of patients for whom nephrectomy was done: flank pain, pyrexia and hematuria (31%), flank pain, pyrexia, LUTS and hematuria (19.7%). All patients had flank pain (100 %). (see table 2)

Figure1. Clinical presentations of Patients for whom nephrectomy was done (N=71)



5.3 Indications for nephrectomy among study subjects

Nephrectomy performed for benign conditions (66.2 %) was the leading followed by malignant conditions (33.8 %). Nephrectomy done for one patient with AML which was biopsy confirmed (1.4%). (see table3)

Table3. Indications for nephrectomy among study subjects SPHMMC (N=71)

Indication	Fre.	%	
AML	1	1.4	
Renal stones + Chronic Pyelonephritis	10	14.1	Fre.
Renal stones + xanthogranulomatous Pyelonephritis	2	2.8	
Neglected Uretero pelvic junction obstruction	33	46.5	
Renal Tuberculosis	1	1.4	
Malignant Conditions	24	33.8	
Total	71	100.0	

5.4 complications of nephrectomy among study subjects

Complications of nephrectomy varied according to the indication, being higher in patients with malignancies (11.1%). (See table 7)

Superficial surgical site infection was the leading complication among study subjects (8.5%) followed by hospital acquired pneumonia (4.2%). (see table 4)

Figure 2. Post nephrectomy complications among study subjects SPHMMC, (N=71)

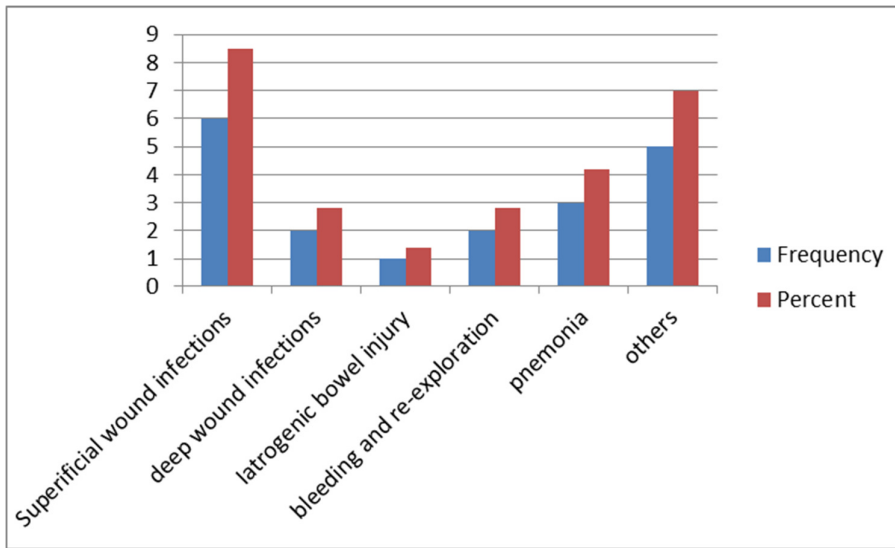


Table5. Age versus indication for nephrectomy among study subjects (N=71)

Age	indication for nephrectomy						Total
	Renal stones and chronic pyelonephritis	Renal stones and XGP	Neglected UPJO	Renal TB	Malignances	others	
less than 15	-	-	1	-	-	-	1
15-30	2	1	17	-	3	-	23
31-45	5	-	9	1	4	1	20
46-60	3	1	5	-	10	-	19
above 60	-	-	1	-	7	-	8
Total	10	2	33	1	24	1	71

Table 6.clinical presentation variables versus indications for nephrectomy among study subjects (N=71)

clinical presentation	indication for nephrectomy					
	Renal stones and chronic pyelonephritis	Renal stones and XGP	Neglecte d UPJO	Renal TB	Malignances	others
flank and LUTS	-	-	9	-	-	-
flank pain, mass and hematuria	-	-	-	-	12	-
flank pain, pyrexia and LUTS	5	1	16	-	-	-
flank pain, pyrexia, LUTS and hematuria	5	1	3	1	3	1
flank pain, LUTS and hematuria	-	-	2	-	6	-
flank pain and hematuria	-	-	3	-	3	-
Total	10	2	33	1	24	1

Table 7.Indication variables versus complications of nephrectomy among study subjects (N=71).

indication for nephrectomy	Complications of nephrectomy						Total
	Superficial wound infections	deep wound infections	Iatrogenic bowel injury	bleeding and re-exploration	pneumonia	others	
Renal stones and chronic pyelonephritis	2	1	-	-	-	1	4
Renal stones and XGP	1	-	-	-	-	-	1
Neglected UPJO	1	1	-	1	1	1	5
Renal TB	-	-	-	-	-	1	1
Malignances	2	-	1	1	2	2	8
Total	6	2	1	2	3	5	19

CHAPTER 6 DISCUSSION

This study attempts to determine the indications for and complications of nephrectomy in SPHMMC. In this study nephrectomy performed for benign conditions (66.2%). Similarly, the studies conducted in TASH reveal nephrectomy performed for benign conditions is higher (5). Nephrectomy performed for malignant conditions (33.8%) in this study is lower than that of TASH (37%). (5)

When this result was compared to the study that was conducted at Tikur Anbessa Specialized Hospital (TASH) the most common presenting symptom was loin pain in 100% followed by LUTS in 74.7% and hematuria in 56.4% while loin pain, hematuria and flank mass presented in 100%, 43.5 % and 35.6 % respectively according to TASH study(5) . Of all our patients who underwent nephrectomy for malignant disease, 12 (17%) patients presented with triad clinical manifestations (loin pain, hematuria and lion or abdominal mass).

Neglected UPJO of different causes (46.5%) is the most common indication for nephrectomy according to our study when compared to study done in Pakistan from Jan. 2014 to 2015 at tertiary care hospital where Stone disease was the most common pathology responsible for non-functional kidney diagnosed in 40 (50%) patients, out of which 35 (43.8%) were with renal stones and 5 (6.2%) with ureteric stones. (1)

Malignant tumors were more common in males necessitating nephrectomy when compared to female patients (24% vs 9.8%) in this study which was similar with study done in Pakistan. (2). Nephrectomy done for one patient (1.4%) with renal tuberculosis in our study which was biopsy confirmed while three (4.1%) patients had nephrectomy for renal Tuberculosis according to the study that was conducted at Tikur Anbessa Specialized Hospital . (5)

Nephrectomy for malignant disease had a higher rate of complications (11.1%) than for benign conditions according to our study while it was 13.8% for malignant conditions according to study in Pakistan.(2)

Chest infections were more frequent in malignant group, two patients (2.8%) developed hospital acquired pneumonia and it is similar to the Pakistan study (2).

Two patients (2.4%) had significant bleeding and needed re-exploration in patients with neglected UPJO and malignant renal disease.

Superficial surgical site infection is the most common complication in 6 cases(8.5%) in our study whereas bleeding was the most common, which occurred in 55.6%,according to Sudanese's study.(4) Two patients died in the postoperative period (<30 days) with overall mortality of 2.8% according to our study while it was 1.4% according to the Sudanese study .(4)

CHAPTER 7 CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

There is a higher rate of nephrectomy performed for benign conditions in SPHMMC (66.2%). Late presenting obstructive uropathy due to UPJO and stone causing loss of renal function was common in our study. Taking results of the studies done in other developing countries, we can conclude that still benign conditions of the kidney are the leading reasons for nephrectomy in developing countries. Nephrectomy for malignant diseases had a higher rate of complications than that for benign conditions.

Our study suggests that the number of nephrectomy performed for non-traumatic kidneys disease is not significantly decreasing even with advent of modern antibiotics and modern investigative modalities. This suggests the dire urgency to provide better health services at a basic level and increasing awareness by education to decrease the rate of nephrectomy for preventable conditions, like renal stone disease.

7.2 RECOMMENDATION

This study suggests the need of dire urgency to provide better health services at basic level and increase in awareness by education to decrease the rate of nephrectomy for preventable conditions like renal stone disease, early detection of renal tumors in any patient with loin pain or hematuria and early intervention for patients with UPJO.

We also recommend further study on postoperative conditions and complications of the procedure on the patients who underwent nephrectomy.

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Annex B Data Collection check list

Instructions: write the required information or put “√” mark in the space provided

Date: ____/____/____

Code no: _____

I Socio-demographic variables

1. Age in years: _____

2. Sex: _____

II Clinical presentations among study subjects

3. Flank pain and LUTS : _____

4. Flank pain, mass and hematuria: _____

5. Flank pain, pyrexia and LUTS: _____

6. Flank pain, pyrexia, LUTS and hematuria: _____

7. Flank pain, pyrexia and hematuria: _____

8. Flank pain and hematuria : _____

9. others: _____

III indications of nephrectomy cases among study subjects

10. renal stones only: _____

11. renal stones and chronic pyelonephritis: _____

12. renal stone and XGP: _____

13. neglected UPJO: _____

14. renal tuberculosis: _____

15. Malignant conditions: _____

16. others: _____

IV complications of nephrectomy among study group

17. Superficial wound infection: _____

18. Deep wound infection: _____

19. Iatrogenic colonic injury: _____

20. bleeding and re-exploration: _____

21. septicemia: _____

22. pneumonia: _____

23. paralytic ileus: _____

24. others: _____

