

Profile and outcomes of patients who develop General post-operative complications in SPHMMC from February 1 to April 30 2018

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ABSTRACT

Background Postoperative complications are frequent events, particularly among patients at high risk. These complications have both clinical effects during the immediate postoperative period and long-term effects on quality of life impairment and increased mortality. The complications that occur after surgery are challenging for physicians because they are sometimes unpredictable, have relatively sudden onset, and can develop quickly toward death

Objectives To describe profile and outcomes of patients who develop postoperative complications in month of February to April 2018 SPHMMC

Methodology A hospital based prospective cross sectional study design was used the study area is at SPHMMC. The study was conducted from February to April 2018. Data was analyzed using SPSS software. The analyzed data presented using charts, tables, and graphs and described using texts.

Results

A total of 60 patients develop post-operative complications. Majority patients were male 34(60 %). The most common mode of admission for those patients who develop post-operative complications is emergency 33(55%). The common pathology seen on those patients who develop post-operative morbidity and mortality is acute abdomen which accounts 27(45%) and followed by thyroid and biliary pathology. Among patients who develop post-operative complication 29 (48.3%) they develop surgical site infection. Pulmonary complication were detected in 16(26.7%) of patient. Fourteen (23.3%) patient develop serum potassium abnormality. Among the patients who develop post-operative complications 38(63.3%) of patients improved and 22(36.6%) of them died.

CONCLUSION

Majority of patients who develop post-operative complication are males. Surgical site infection and pulmonary complications are the common one. Emergency patients develop post-operative complication more than elective patients.

KEY WORDS postoperative complication, pulmonary complication

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ABBREVIATIONS

DVT Deep Venous Thrombosis

HAI Hospital acquired infection

ICU Intensive care unit

PE Pulmonary embolism

PPC Post-operative pulmonary complication

PPPD Post-operative psychiatric disorder

SPHMMC St Paulo's Hospital Millennium medical College

SSI Surgical site infection

VTE venous thrombo embolism

INTRODUCTION

1.1 Background

Postoperative complications are frequent events, particularly among patients at high risk. These complications have both clinical effects during the immediate postoperative period and long-term effects on quality of life impairment and increased mortality. The complications that occur after surgery are challenging for physicians because they are sometimes unpredictable, have relatively sudden onset, and can develop quickly toward death. Many patients with acute pathophysiological disorders require admission to intensive care units (ICU) for better disease control and management (1).

Approximately 200 million people are estimated to undergo major non-cardiac surgery each year, and nearly 1 million die as a result of postoperative complications. Knowledge of the factors associated with postoperative mortality allows for better clinical decision making, not only to act and correct modifiable factors but also operating at the right time and optimizing surgical outcomes(1).

Although the likely predictors of death after surgery have been studied extensively, the available knowledge regarding the effect of postoperative complications on mortality is limited.

Hospital acquired infections (HAI) are infection acquired in hospital by patients admitted for reasons other than that infection i.e. an infection occurring in a patient in a hospital or other health Care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.(2)

Surgical site infections (SSIs) are the most common types of HAI. It is a common Postoperative complication and known to cause significant postoperative morbidity and mortality; it is responsible for prolonged Hospital stay, and also known to add up to 20 % in hospital costs. SSIs are among the commonest hospital acquired infections comprising 14-16 percent of inpatient infections. It is a dangerous condition that puts a heavy burden on the patient and social health system (2).

Pulmonary complications after surgery are a leading cause of postoperative morbidity and mortality. Advances in anesthesia and surgical technique have made

operative intervention possible in patients with serious underlying cardiopulmonary disease who previously would have been denied surgery. There is general agreement that thoracic and upper abdominal surgery carry the highest risk of postoperative respiratory complications. Postoperative pulmonary complications contribute significantly to overall perioperative morbidity and mortality (3).

Post-operative urinary complications are one of the common complications and 80% of them are associated with the use of an indwelling bladder catheter. Urinary infections are associated with less morbidity than other nosocomial infections, but can occasionally lead to bacteremia and death.

Venous thromboembolism (VTE), including deep venous thrombosis (DVT) and pulmonary embolism (PE), is an important preventable cause for morbidity and mortality among surgical patients

Operative trauma is followed by a series of changes collectively referred to as metabolic response to injury, the magnitude and duration of the response being directly proportional to the severity of the trauma. Operative trauma imposes a great impact in the physiology of fluid and electrolytes within the body. Fluid and electrolyte management has thus been an integral part of care of each and every surgical patient.

1.2 Statements of the problem

Hospital-acquired infections add to functional disability and emotional stress of the patient and may, in some cases, lead to disabling conditions that reduce the quality of life. Nosocomial infections are also one of the leading causes of death. The economic costs are considerable. The increased length of stay for infected patients is the greatest contributor to cost. One study showed that the overall increase in the duration of hospitalization for patients with surgical wound infections was 8.2 days, ranging from 3 days for gynecology to 9.9 for general surgery and 19.8 for orthopedic surgery(2).

The most frequent nosocomial infections are infections of surgical wounds, urinary tract infections and lower respiratory tract infections. The WHO studies, and others, have also shown that the highest prevalence of nosocomial infections occurs in intensive care units and in acute surgical and orthopedics wards. Infection rates are higher among patients with increased susceptibility because of old age, underlying disease or chemotherapy.

One study done in Omaha in 15 medical centers found that Four hundred thirty-five major complications were diagnosed within 30 days of the patients' operated on. Seventy-four (17%) occurred within 1 day, 185 (43%) between 1 and 3 days, 72 (17%) between 4 and 7 days, and 104 (24%) between 8 and 30 days. Three deaths (8%) occurred within 1 day, 3 (8%) in 1 through 3 days, 4 (11%) in 4 through 7 days, and 27 (73%) in 8 through 30 days. The greatest risk of hypotension (43%), myocardial infarction (47%), and respiratory depression (55%) was within first day. The highest incidence of congestive heart failure (46%), pulmonary embolus (50%), and respiratory failure (76%) occurred at day one through 3. Pneumonia (38%) was most common at day 4 through 7. Cerebrovascular accident (53%) and sepsis (71%) occurred mainly at day 8 through 30. Renal failure had a bimodal distribution with maxima at day1 through 3 (31%) and day 8 through 30 (56%). The risk of cardiac arrhythmia and gastrointestinal tract bleeding was similar throughout all intervals-(4).

In other study performed in the Santo Antônio Hospital in Blumenau, Islandshows that the incidence of postoperative pulmonary complications was 11.5%. The most common complications were respiratory failure, pleural effusion and pneumonia. The most important risk factor were diabetes, hospitalization for more than five days and the presence of pulmonary disease (5)

1.3 Significance of the study

Surgery is an essential component in health care. Complications after surgery account significantly for morbidity and mortality among patients after surgery. These complications in Sub-Saharan African settings are mainly anesthesia and infection-related. It has been observed that poor surgical safety practices and systematization (e.g. prophylactic antibiotic therapy, confirmation of effective Sterilization of instruments) are consistent with the burden of infections after surgery in our settings.

Even though the extent of postoperative complication in Ethiopia is significant, there are no published studies and there is no baseline information regarding post-operative complication and out comes in Ethiopia.

Therefore, it is necessary to conduct this study to assess the profile and outcome of patients who develop postoperative complication in SPHMMC

Literature review

The post-operative complications can be defined as any negative outcome as perceived either by the surgeon or by the patient. These complications can be encountered after any surgery, but the key to success is the early detection and the prompt management (6)

The most common type of HAI observed in the study performed in two teaching hospital in Amhara region surgical site infection, which contributes to 51% of the total HAIs(8) and Pneumonia occupied the second position (14.1%).the other study performed in Hawassa teaching hospital showed surgical site infection has an incidence of 19.1%.(8)

In other study performed Tartu University Hospital in EstoniaThe rate of postoperative complications was 33.5%. The most common complication was delirium, which occurred in 12.8% of patients. The most common infectious complications were pneumonia (6.1%), intra-abdominal infection (4.2%) and wound infection (4.2%). Septic shock developed in 4.1% of the patients.

2.1 Surgical site infection

Surgical site infections (SSIs) are the most common complications after surgery that has significant impact in patient morbidity, mortality and health care cost.

A study done in Jimma university teaching hospital included total of 105 patients that fulfilled the inclusion and exclusion criteria. Sixty four patients (61%) were males and more than half of the patients were from rural 60(57.1%) area. The mean age of the patients was 30.85 ± 17.72 years. The mean Body Mass Index (BMI) was 21.6 ± 4 kg/m², three patients (2.9%) were obese with BMI ≥ 30 Kg/m². Five patients (4.8%) received blood transfusion preoperatively. Three (2.86%) patients received systemic steroids but none of them took for more than 3 weeks. Twenty eight (26.7%) patients were smokers. More than half of patients were under ASA score of II, 67(63.8%). The mean preoperative hospital stay and total hospital stay of the patients were 5.59 ± 7.78 and 11.03 ± 9.71 days respectively. Out of 105 patients, 20(19.1%) patients developed SSIs. Among patients who developed SSIs, 17(85%) patients developed SSIs before they were discharged from hospital.(09)

In other study performed in prevalence of surgical site infections and associated factors among patients who had abdominal operations in HiwotFana Specialized University Hospital ,Harar Town ,Ethiopia.Among the total of 592 operated clients the total prevalence of SSI was 66(11.1%). From these the surgical site infections observed was deep/incisional post-operative SSI 49(74.24%) followed by Superficial 9 (13.64%) and organ space 8 (12.12%). Not only this but also the prevalence of SSI from emergency surgical cases was 56/450(12.5%) compared to the elective cases in which 4/142(2.8%) observed.(10)

2.1.1 Pulmonary complications

Pulmonary complications defined with Respiratory complications that occur within 48–72 h following surgery, Conditions affecting the respiratory tract that can adversely influence clinical course of the patient after surgery, Any pulmonary abnormality occurring in the post-operative period that produces identifiable disease or dysfunction that is clinically significant and adversely affects the clinical course.

There was one study performed on Gonder teaching hospital on Postoperative Pulmonary Complications and Associated Factors among Surgical Patients Patients who developed postoperative pulmonary complications were 88 (21.7%). Of which 60.2% were emergency patients. Among the postoperative pulmonary complications evaluated, majority were postoperative pneumonia 75 (85.2%) followed by Bronchitis 10 (11.4%), respiratory failure 1 (1.1%) laryngeal edema 1 (1.1%) and heamothorax 1 (1.1%) .Out of 84 patients that underwent head and neck procedures, 20 developed post-operative pulmonary complications (23.8%). From 44 lower abdominal cases 11 developed post-operative pulmonary complications (25%). With regard to lower abdominal procedures, out of 240 cases 56 developed PPC (23.3%)(11)

Post-operative pulmonary complications (PPCs) occur in 5–10% of patients undergoing non-thoracic surgery and in 22% of high risk patients. Even in minor surgeries, the incidence can be 1–2%. As many as one in four deaths occurring within a week of surgery is related to pulmonary complications, thus making it the second most common serious morbidity after cardiovascular event. There is a wide variation in the incidence of PPCs from 2% to 40%.This is mainly due to lack of uniformity about the inclusion of medical conditions as PPCs.(11)

A Cohort study done in UK on Postoperative pulmonary complications following major elective abdominal surgery shows, thirty-two (11.9 %) PPC were reported at

7 days. PPC was more common in patients with a history of chronic obstructive pulmonary disease compared to those with no history (26.7 vs. 10.2 %, $p < 0.001$). PPC was not associated with other patient factors (e.g. age, gender, body mass index or other comorbidities), type/method of operation or postoperative analgesia. The risk of PPC appeared to increase with every additional minute of operating time independent of other factors (odds ratio 1.01 (95 % confidence intervals 1.00–1.02), $p = 0.007$). PPC significantly increase the length of hospital stay (10 vs. 3 days). Attendance to the emergency department within 30 days (27.3 vs. 10.6 %), 30-day readmission (21.7 vs. 9.9 %) and 30-day mortality (12.5 vs. 0.0 %) was higher in those with PPC.(12)

2.2 Venous thromboembolism

A study performed in Russia on the problem of postoperative venous thromboembolic complications in general surgery. The study included 45 patients who underwent elective (21) and urgent (24) abdominal and pelvic interventions. Deep venous thrombosis of lower limbs was diagnosed in 11.1%, most of cases being asymptomatic.(13)

In other study on deep venous thrombosis after general surgical operations at a university hospital from American college of surgeon; Diagnosis of DVT was based on symptoms in 94.3% of cases and based on routine duplex screening in 5.7% of cases. Upper extremity DVTs occurred in 40%; lower extremity DVTs occurred in 45.7%; and combined upper and lower extremity DVTs occurred in 14.3% of patients. The mean time between diagnosis of DVT and the index operation was 8.6 days with 29 of 35 patients (83%) with DVT diagnosed as an inpatient and 17% diagnosed in the outpatient setting.(14)

2.3 Electrolyte Disturbance

A study done in Bihir India shows there was fall in the serum sodium level in the day of operation (Day 0) in all cases, which was continued in the 1st postoperative day (Day+1). From 2nd postoperative day (+2 day) onwards the serum Sodium level started to rise gradually and attained its normal preoperative value on 4th postoperative day (+4) onwards in most cases. The preoperative day level was restored in all cases by the 7th postoperative day (+7 day). Similar changes occur in the levels of serum chloride as that of serum Sodium. There was elevation of serum potassium on the day of operation (day 0), which was of its highest on +1

day. Then there was a gradual fall in its level to attain the preoperative value by round 4th postoperative day (day +4). By the 7th postoperative day (+7) it has attained preoperative value in all the cases.

2.4 Post-operative psychiatric disorders

Postoperative psychiatric disorder (PPD) is a common problem in general surgery. In one study performed on background factors of postoperative psychiatric disorders in Japan; One hundred and forty-five (13.7% of all) patients presented some symptoms of PPD, such as delirium. Their onset was about 2.7 days on an average, postoperatively. PPD occurred more frequently in older patients, men, and those with a longer operation time, longer ICU stay.⁽¹⁵⁾ A Study on the Prevalence of Psychiatric Morbidity in Post-Operative Patients Who Have Undergone Major Abdominal Surgeries in India; A total of 120 patients were screened for psychiatric morbidity in the postoperative period. 33 patients had a diagnosis of psychiatric illness with a prevalence of psychiatric morbidity in post-operative patients is around 27%.

2.5 Post-operative mortality

Post-operative mortality in Europe a seven day cohort study done in 2011 of 46 539 patients, of whom 1855 (4%) died before hospital discharge. 3599 (8%) patients were admitted to critical care after surgery with a median length of stay of 1.2 days⁽¹⁶⁾

OBJECTIVES

3.1 General Objectives

To determine profile and outcomes of patients who develop postoperative complications in month of February 1to April 302018 SPHMMC in patients admitted to SPHMMC for surgery

3.2 Specific objectives

To describe the characteristics of patients who develop post-operative complications

To describe the outcomes of patients who develop post-operative complications

To describe major risk factors for postoperative complication.

Methods

4.1 Study design

A hospital based prospective study design was used.

4.2 Study period

The study was conducted from February 1 to April 30 2018

4.3 Study area

The study was conducted In SPHMMC surgical in patient unit which is found in Addis Ababa. It is a tertiary referral hospital serving a catchment population. The hospital has 350 beds see an annual average of 300,000. It has catchment of population of more than 5 million.

4.4 Source populations

All patients who underwent major surgery during the study period in SPHMMC department of Surgery

4.5 Study population

All patients who develop post-operative complications on the study period was used as the study population.

4.6 Sample size & sampling technique

Technique survey conducted in all patients at SPHMMC surgical inpatient unit who develop PPC after major surgery in the study period.

All patients who develop post-operative complications on the study period are the sample size. Convenient sampling technique was used.

4.7 Inclusion criteria

All Patients who develop post-operative complications during the study period.

4.8 Exclusion criteria

Patients who were operated at other Hospital and develop postoperative complication and transferred to our hospital.

4.9 Study variables

4.9.1 Dependent variables

Postoperative complication, SSI, postoperative pneumonia, UTI, DVT, VTE, Fluid & Electrolyte Disturbance, postoperative death.

4.9.2 Independent variables

Age, Sex, Mode of Operations, Cigarette Smoking, DM, Hypertensive, Steroid Use. Time of presentation

4.10 Data collection technique and instruments

Data was collected using questioners and was collected by trained medical interns and follow up will be made for every operated patients.

4.11 Data quality control

Training and orientation about the objective and process of data collection was presented for data collectors

Consistency in data collection through- Standardized checklist for identification of postoperative complication, Capacity building for data collectors through orientation on checklists regular data check for accuracy and consistency.

Close supervision and follow up will be made during the data collection.

4.12 Data analysis and interpretation

Collected data was compiled and entered to computer after checking for accuracy and consistency. Data was sorted, summarized and, entered into computer using developed data entry format, coded for each category of variables and checked for errors. Entered data was analyzed by the investigator using SPSS.

4.13 Operational definition

General post-operative complications..... Systemic complications developed after operation which is not surgery specific.

Surgical site Infection Infections in the area of operational wound within 30 days of operation, confirmed by clinical examination were regarded as SSI.

Post-operative pulmonary complication Respiratory tract infection develops on postoperative period.

Post-operative death any death regardless of cause, occurring within in hospital admission on postoperative period.

Operations: A surgical procedure, usually carried out with instruments but sometimes using only the hands

4.14 Ethical consideration

Ethical clearance for the proposed research was obtained from research committee of SPHMMC. Letters of support also received from department of surgery. Further permission letter obtained from the Department of Surgery SPHMMC. Verbal consent obtained from study subjects. Confidentiality of the information strictly adhered to in line with local and national regulations/protocols throughout the data collection process.

4.15 Plan for dissemination of results

The finding of this study is submitted to SPHMM Department of surgery in writing Summary of findings and recommendations is given for Hospital administrators, policy makers, developing partners and other pertinent stakeholders.

RESULTS

5.1 DEMOGRAPHIC

A total of 60 patients develop post-operative complications among them majority groups 71.7 % are between the age group of 40 to 60 years. The minimum age was 1 year while the maximum age was 90 years. The mean age was 46.69 and the median age was 50 .Majority patients were male 34(60 %).

Table 1: Demographic characteristics of patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

Age	Sex		Total
	Male	Female	
Less than 15 years	1	3	4
15 to 40 years	8	8	16
40 to 60 years	15	8	23
Greater than 60 years	12	5	17
Total	36	24	60

5.2 CLINICAL DATA

Patients who were operated on the study period and develop post-operative morbidity and mortality was also seen according to their mode of admission.

The most common mode of admission for those patients who develop post-operative complications is emergency 33(55%).

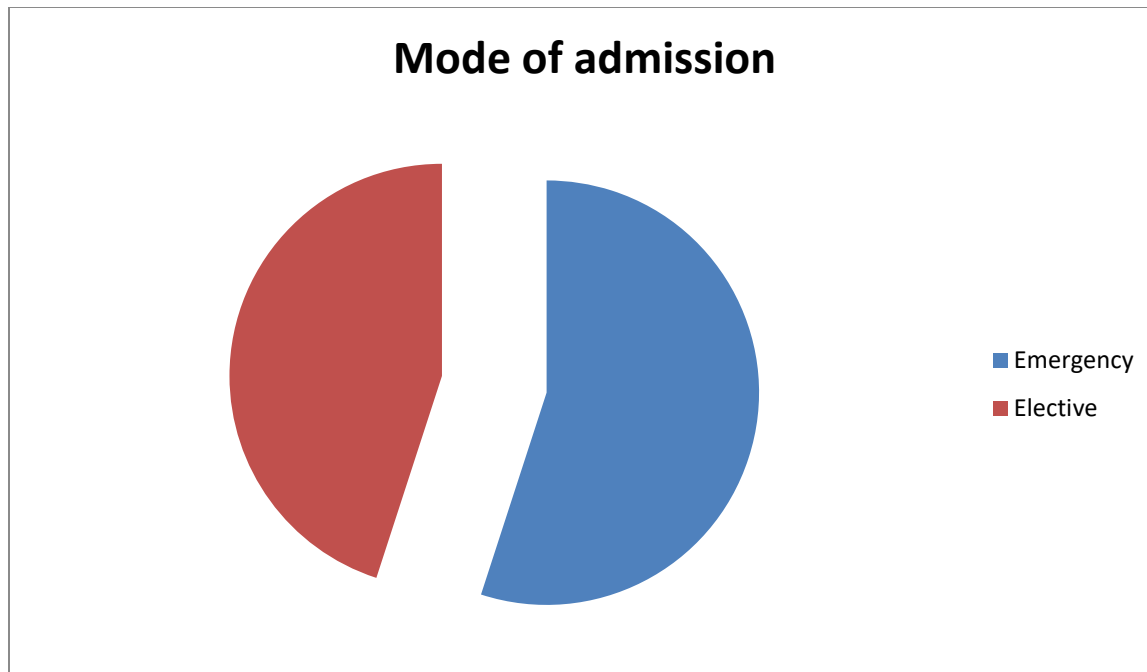


Figure 1 Mode of admission of patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

Among the patients who develop post-operative morbidity and mortality Most of the patients were admitted in the unit of General surgery 46 (76.7%) followed by urology and pediatric surgery.

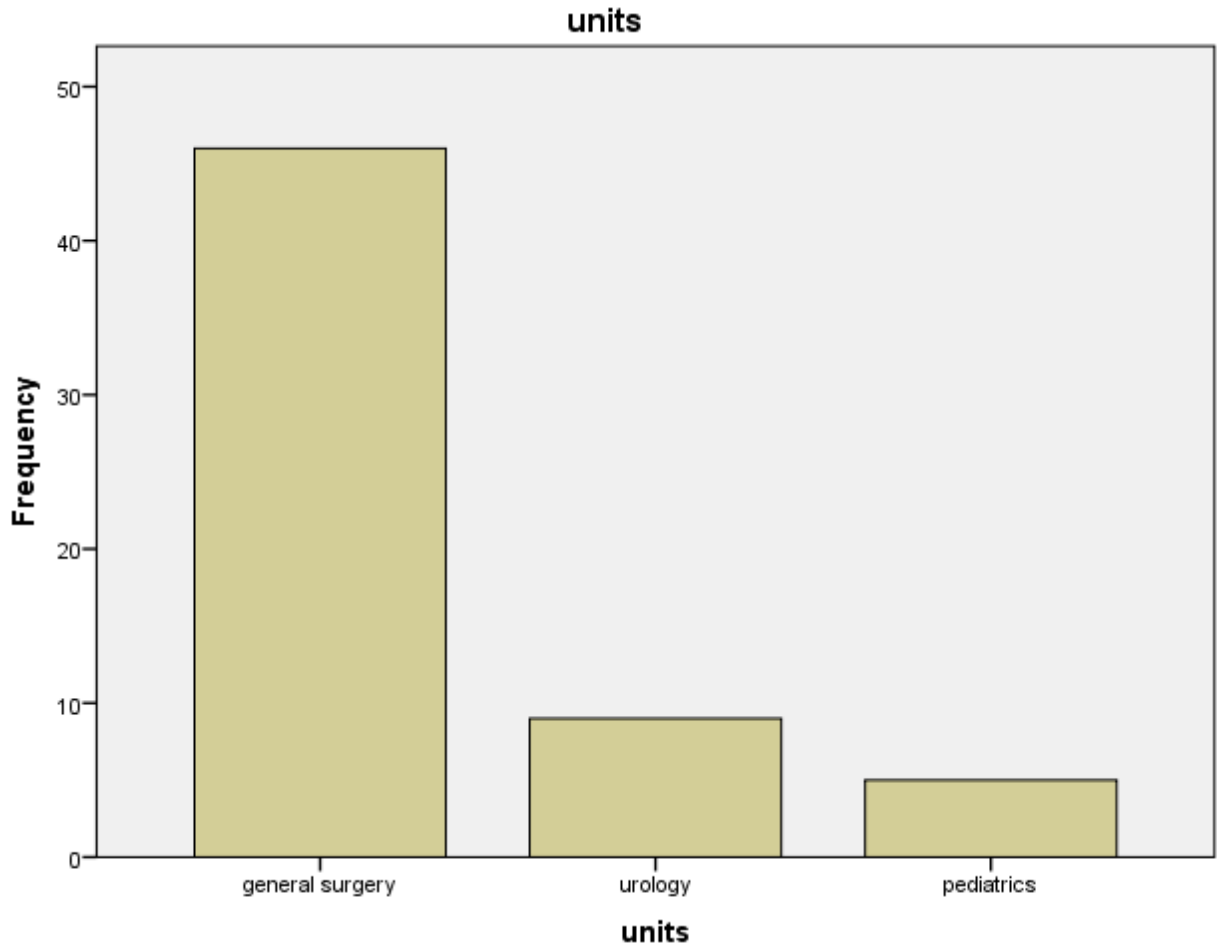


Figure 2 Units of admission of patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

The common pathology seen on those patients who develop post-operative morbidity and mortality is acute abdomen which accounts 27(45%) and followed by thyroid and biliary pathology. Among patients admitted on urology unit prostate pathology accounts 6.7% followed by urinary stone 1.7%.

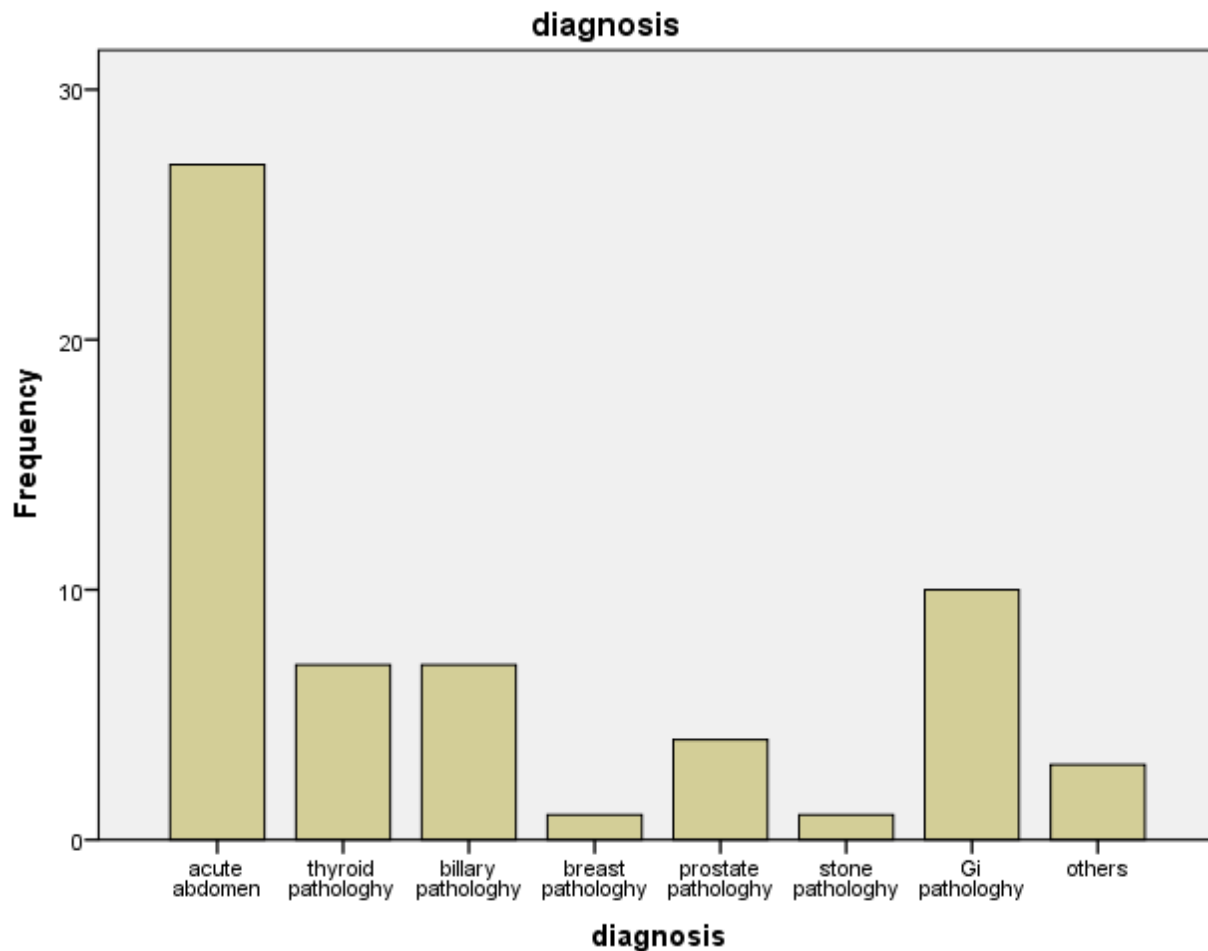


Figure 3 Common pathology seen on patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

Majority of patients who develop post-operative morbidity and mortality they doesn't have known comorbidity. Among patients who do have comorbidity HTN and DM are the common one with frequency of 6.7 and 5 % respectively.

Table 2 Associated comorbidity of patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

Comorbidity	Frequency	Percentage
DM	3	5
HTN	4	6.7
Asthma,COPD	1	1.7
others	2	3.3
No known comorbidity	50	83.3

5.3 Post-operative complication

5.3.1 Surgical site infection

Among patients who develop post-operative complication 29 (48.3%) they develop surgical site infection. Superficial surgical site infection account 15(25%) of it and deep or organ specific surgical site infection accounts 14(23.3%).

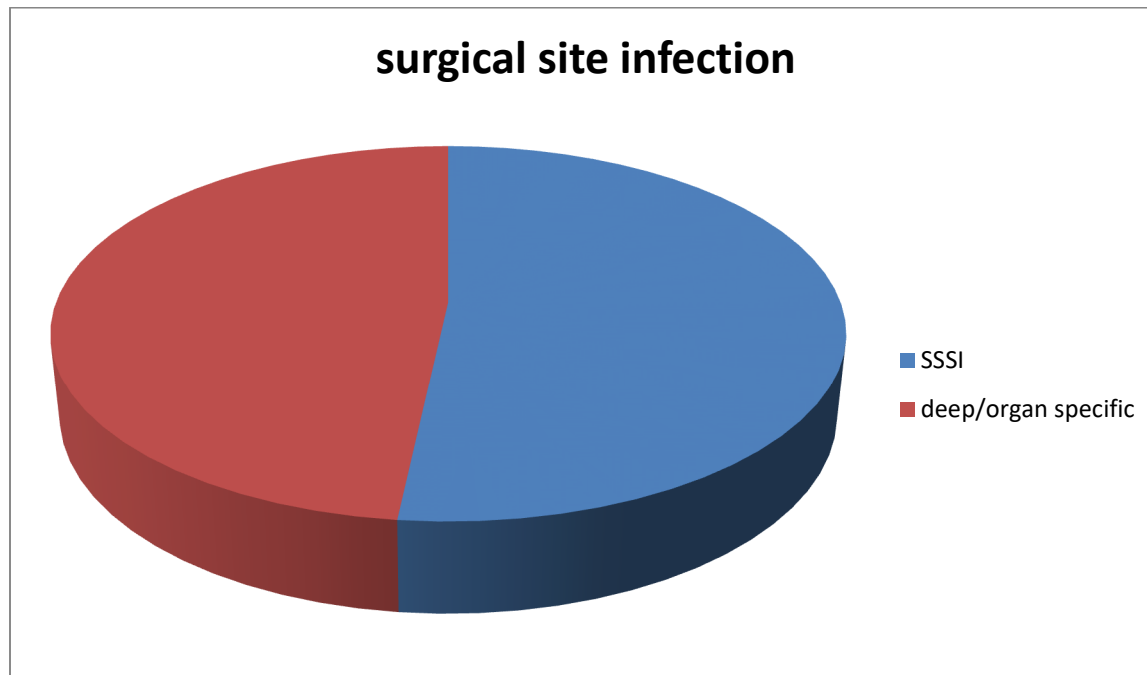


Figure 4 Surgical site infection on patients who develop post-operative complications At SPHMMC, Addis Ababa, Ethiopia from February to April 30 2018.

5.3.2 Pulmonary complication

Pulmonary complication were detected in 16(26.7%) of patient and 14(23.3%) is hospital acquired pneumonia and 2 (3.3%) of patients develop atelectasis.

5.3.3 Venous complications

Only 3 (5%) of patients develop venous complications which is pulmonary thromboembolism.

5.3.4 Electrolyte disturbance

Fourteen (23.3%) patient develop serum potassium abnormality among them 13(21.6%) of them develop hypokalemia and one patient develop hyperkalemia. Only one patient develops hyponatremia.

5.3.5 Outcome of patients

Among the patients who develop post-operative complications 38(63.3%) of patients improved and 22(36.6%) of them died six of patients are elective and 16 of them are emergency patients. Forty five

percent of died patients are female and the rest are male. Most of possible cause of death is MOF secondary to septic shock which account 54 %.

Discussion

Surgical site infections (SSIs) are the most common complications after surgery that has significant impact in patient morbidity, mortality and health care cost.29 (48.3%) they develop surgical site infection . A study done Hawassa teaching hospital showed surgical site infection has an incidence of 19.1%.(8).In our study Superficial surgical site infection account 15(25%) of it and deep or organ specific surgical site infection accounts 14(23.3%).

Pulmonary complications defined with Respiratory complications that occur within 48–72 h following surgery, Conditions affecting the respiratory tract that can adversely influence clinical course of the patient after surgery, Any pulmonary abnormality occurring in the post-operative period that produces identifiable disease or dysfunction that is clinically significant and adversely affects the clinical course.

In our study Pulmonary complication were detected in 16(26.7%) of patient and 14(23.3%) is hospital acquired pneumonia and 2 (3.3%) of patients develop atelectasis. There was one study performed on Gonder teaching hospital on Postoperative Pulmonary Complications and Associated Factors among Surgical Patients Patients who developed postoperative pulmonary complications were 88 (21.7%) (11)which is comparable to our study.

Postoperative venous thromboembolism complication in our study is five percent which is PTE unlike the study performed in Russia on the problem of postoperative venous thromboembolic complications in general surgery The study included 45 patients who underwent elective (21) and urgent (24) abdominal and pelvic interventions. Deep venous thrombosis of lower limbs was diagnosed in 11.1%, most of cases being asymptomatic.(13) This can be explained by our only clinical evaluation method of patients with thromboembolic complication.

In our study postoperative mortality occur in 36.6% of patient who develop post-operative complications.

CONCLUSION

Majority of patients who develop post-operative complication are males and the common age group is between ages 40 to 60 years.

Surgical site infection and pulmonary complications are the common one.

Emergency patients develop post-operative complication more than elective patients.

Acute abdomen is the common pathology seen in patients who develop postoperative complications.

Among the electrolyte disturbance seen in postoperative patients Hypokalemia is the common one.

The common possible cause of death is multi organ failure secondary to septic shock.

RECOMMENDATIONS

- Head of surgical ward and staff members should have strengthened timely Detecting surgical complication and managing timely.
- The surgical department should strength on laboratory and radiologic investigations beside clinical evaluation.
- Standardized patient oriented post-operative follow up scheme should be implemented
- Further large scale prospective studies should be done in the same subject matter.
- ICU care and post-operative care should be given to decrease the mortality.

Limitation of the study

Single hospital based study

Short study period.

Lack of postoperative patients laboratory and radiologic evaluation beside clinical evaluation for detection of postoperative complication.

Annexes

Questioner

Socio demographic data

Age of the patient....

Sex

Male

Female

Religion

Orthodox

Muslim

Protestant

Catholic

Others

Residence

Urban

Rural

Clinical data

Mode of admission

Elective

Emergency

Units of admission

General surgery

Urology

Pediatric surgery

Duration of the illness.....

Duration of pre op hospital stay.....

Admission Diagnosis of the patient.....

Comorbidity of the patient

DM

Hypertensive

Asthma, COPD

HIV/AIDS

Others

Preoperative investigations

CBC.....

WBC count

Hemoglobin/hematocrit level

LFT

Albumin

Liver enzymes

RFT

Cr

BUN

Serum electrolyte

Potassium

Sodium

Others

Other investigations

Duration surgery

Types of complications

SSI

Superficial

Deep/organ specific

Pulmonary complications

Atelectasis

HAP

ARDS

others

Venous complications

DVT

PTE

Urinary complications

Retention

UTI

Psychiatric complications

Electrolyte disturbance

Potassium

Hyperkalemia

Hypokalemia

Sodium

Hypernatremia

Hyponatremia

Others (specify)

Outcome of the patient

Improved and discharged

Yes

No

Died

If the outcome of the patient is death what is the possible cause of death.....

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