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A STUDY ON AVERAGE LENGTH OF STAY IN MEDICAL AND SURGICAL SPECIALITIES

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ABSTRACT

The average length of stay (ALOS) provides important information regarding care efficiency and the financing of hospitals. The maximum amount of revenue generated from any patient is in the first few days of the patient's stay in the hospital. An important factor in utilization of hospital resources lies in the efficient utilization of hospital beds. The study aims to analyze the average length of stay of inpatients in the medical and surgical specialities and explore the factors influencing the length of stay. This study is conducted at a teaching hospital in Hyderabad for a period of three months. A sample of 100 patients are selected for the study purpose who include 40 from medical specialities and 60 from surgical specialities. Primary data is collected through observation and interview. Secondary data is collected from medical records.

The findings revealed that highest average length of stay is because of dengue fever, viral pyrexia in medical specialities and cholelithiasis, hernia in surgical specialities. The various factors contributing to prolonged length of stay of the patients in the hospital includes age, sex, diagnosis, mode of payment, comorbidities, complications that arouse or were already present, medical condition of the patient and any other delays like staff unavailability, OT unavailability and delays in pre anaesthesia checkup. Hospital acquired infections, delay in discharges also increased ALOS. ALOS is found to be more in patients with credit payment than cash patients.

Key Words: Admissions**,** Average Length of Stay (ALOS), Inpatient days, Medical Specialities, Surgical Specialities, Teaching hospital.

INTRODUCTION

Average length of stay (ALOS) means the average number of inpatient days of stay. It refers to the average number of days patients spend in the hospital. ALOS is regarded as an indicator of efficiency and is often used for health planning purposes. It is used to assess hospital resource utilization and quality of care. All other things being equal, a shorter stay will reduce the cost per discharge. Low ALOS is ideal and it would be achievable only when all clinical care processes and outcomes are optimal and there are no complications while the patient is at the hospital.

The average length of stay (ALOS), which is an important indicator of hospital efficiency, depends on number of factors. The primary factors determining ALOS depends on case-mix, case severity and the current treatment practices determined by physicians and technology. Hospital utilization statistics are crucial for effective managerial operations, with one of the key metrics being the length of stay (LOS). LOS represents the duration between a patient's admission and discharge from the hospital.

Length of stay is important to hospitals for a combination of clinical and financial reasons. Clinically, there is a large body of evidence which demonstrates an association between adverse events and length of stay.

It's hard to know whether complications lead to long length of stay or vice versa. The maximum amount of revenue generated from any patient is in the first few days of the patient's stay in the hospital. This could be in the form of various diagnostic procedures, surgical procedures, etc. An important factor in utilization of hospital resources lies in the efficient utilization of hospital beds. As the length of stay decreases it helps in preventing the patient from hospital related infections and the faster the patient gets discharged it is said that hospital has good quality as patient recovered soon.

LITETATURE REVIEW

Wright SP et al (2003) investigates the effect of patient-related variables, in-hospital progress and complications on length of stay. Mehmood K (2023) et al conducted a study to assess the average length of stay (ALOS), duration of surgery (operative time), economic status of patients, and patient-incurred costs associated with robot-assisted surgeries compared to conventional surgical procedures.

Hoffman SE et al (2023) devised a new clinical pathway to redirect patients undergoing routine craniotomies from the standard route of admission to the intensive care unit (ICU) after surgery. The goal was to enhance the efficient use of ICU resources, lower overall hospital costs and durations of stay, while upholding high standards of care and satisfying patients. Singh MP et al (2022) present the costs of surgical health benefit packages (HBPs) for secondary care in public district hospitals.

Walsh B et al (2022) investigates how alterations in the availability of inpatient beds due to shifts in healthcare spending during the recession affected the length of emergency inpatient stays in Ireland from 2010 to 2015.

Jia H et al (2019) studied the impact of healthcare-associated infections (HAIs) on length of stay (LOS) and concluded that HAIs not only bring additional medical cost to the patients but also prolong the LOS. Adogwa O et al (2019) investigate the influence of postoperative complications and patient comorbidities on variance in extended length of hospital stay after lumbar spine surgery.

Kusumawati HI et al (2019) emphasize the typical durations for different stages of patient progression within the Emergency Department (ED) and the elements influencing the length of stay (LOS) in a tertiary hospital located in Yogyakarta.

Eskandari M et al (2022) noticed that individuals with more severe medical conditions, requiring hospitalization in critical care units, experienced a lengthier stay in the hospital compared to those not requiring critical care. Additionally, older patients had a longer hospital stay than younger ones.

OBJECTIVE OF THE STUDY

- To evaluate and analyze average length of stay in medical and surgical specialities.
- To explore the factors influencing the length of stay.

MATERIALS ANDMETHODS

The study employs an observational and cross-sectional approach to study the average length of stay of patients in inpatient wards of medical and surgical specialities. The study is conducted for a period of three months at a teaching hospital in Hyderabad. A sample of 100 patients are selected by random sampling technique from the inpatient wards out of which, 40 patients are from medical specialities and 60 patients from surgical specialities. Primary data is collected through observation and interview methods. Secondary data is collected from medical records.

RESULTS AND DISCUSSION

Data analysis is done by calculating the average length of stay of patients from medical and surgical specialities. Here average length of stay is calculated using mean. The following formulae is used for calculation of average length of stay.

Average length of stay (in days) = Total inpatient days of care
. Total no. of admissions

Average length of stay (ALOS) in medical specialities using mean

- It is observed that in medical specialities, for 40 admissions the total inpatient days of care is 194 days. Hence the ALOS average length of stay in medical specialities using mean is found to be 4.85 days.
- ALOS in medical specialities = 194/40 = 4.85 days.

Average length of stay (ALOS) in surgical specialities using mean

- It is observed that in surgical specialities, for 60 admissions the total inpatient days of care is 527 days. Hence the ALOS average length of stay in surgical specialities using mean is found to be 8.78 days.
- ALOS in medical specialities = 52760 = 8.78 days.

Analysis of outliers

- The total no. of inpatient days of care in medical specialities is 194 and the total no.of admissions 40. Out of 40, 18 patients exceeded the mean ALOS in medical specialities.
- The total no. of inpatient days of care in surgical specialities is 527 and the total no.of admissions 60. Out of 60, 30 patients exceeded the mean ALOS in surgical specialities.

Gender wise distribution of inpatients in medicalspecialities

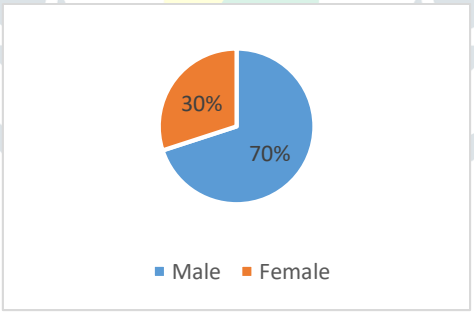

Figure 1- Gender wise distribution of inpatients in medical specialities

From figure 1 we can observe that 70% of the inpatients in medical specialities are males and 30% of them are females.

Gender wise distribution of inpatients exceeding ALOS in medical specialities

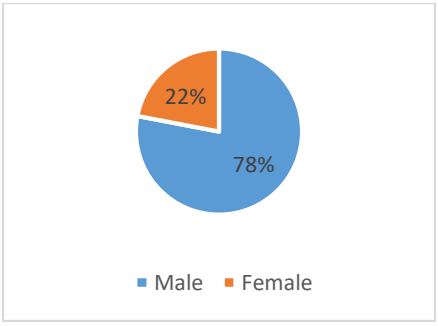

Figure 2- Gender wise distribution of inpatients exceeding ALOS in medical specialities

While analyzing percentage of male and female outliers in medical specialities using mean ALOS, it is seen that males occupy 78% and females 22%, as evident from figure 2.

Gender wise distribution of inpatients in surgical specialities

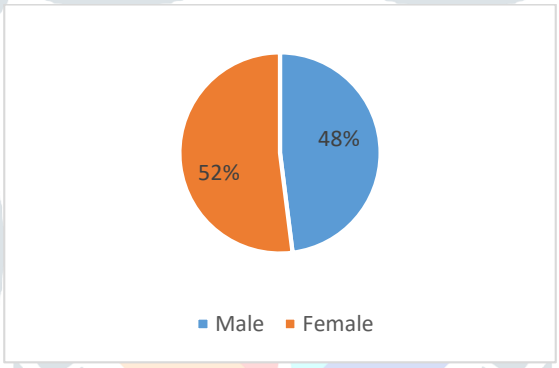

Figure 3- Gender wise distribution of inpatients in surgical specialities

From figure 3 we can observe that 48% of the inpatients in medical specialities are males and 52% of them are females.

Gender wise distribution of inpatients exceeding ALOS in surgical specialities

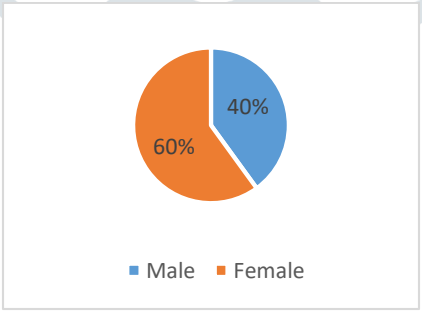

Figure 4- Gender wise distribution of inpatients exceeding ALOS in surgical specialities

While analyzing percentage of male and female outliers in surgical specialities using mean ALOS, it is seen that females are 60% and males 40%.

Age wise distribution of inpatients in medicalspecialities

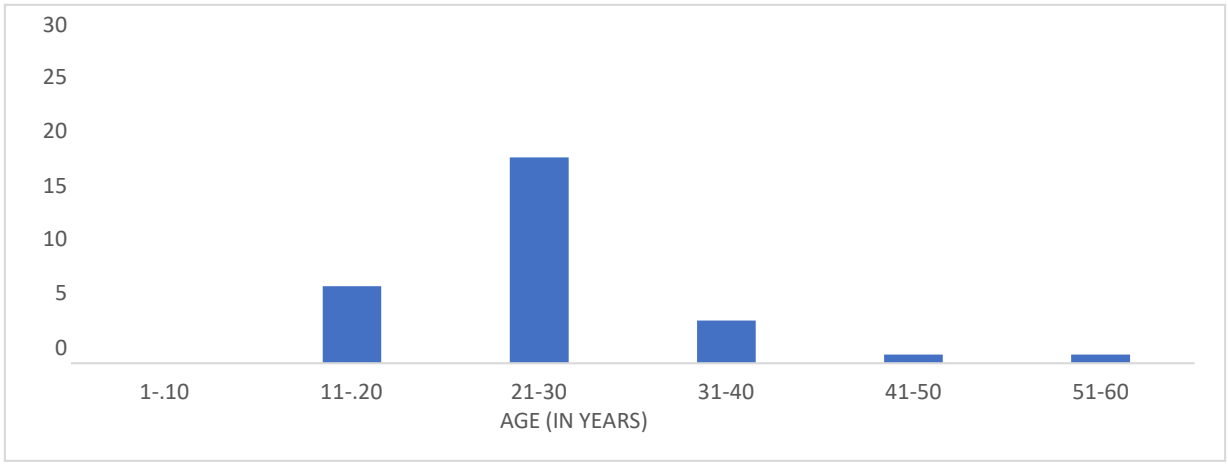

Figure 5- Age wise distribution of inpatients in medical specialities using mean

From figure 5 it can be observed that patients admitted in medical specialities are mostly between age groups 21 to 30.

Age wise distribution of inpatients in medicalspecialities exceeding ALOS

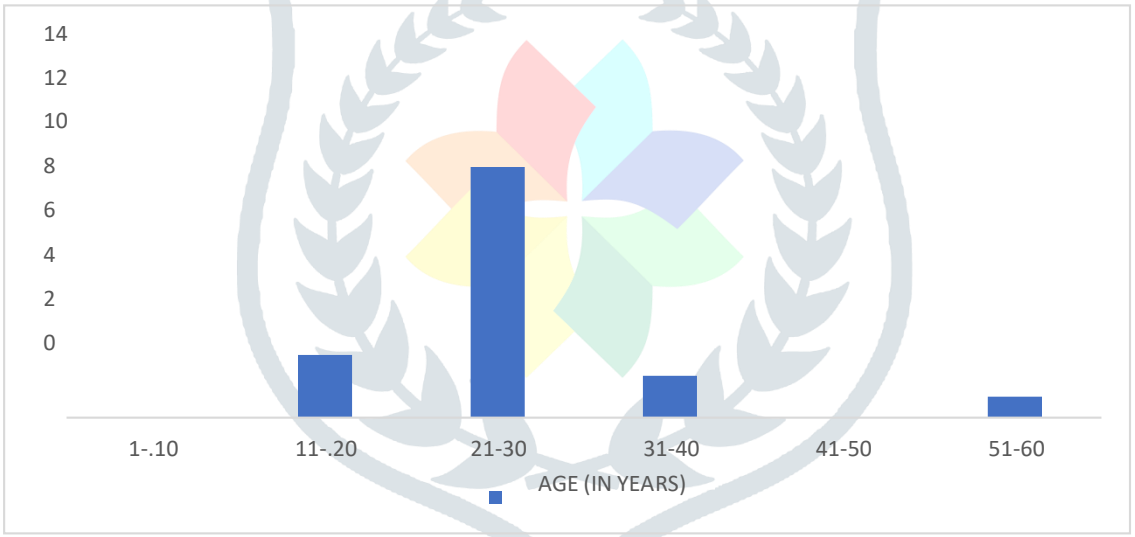

Figure 6 – Age wise distribution of patients exceeding ALOS in medical specialities

Figure 6 shows that majority of patients who exceeded the mean ALOS in medical specialities lie between the ages of 21- 30 years

Age wise distribution of inpatients in surgical specialities

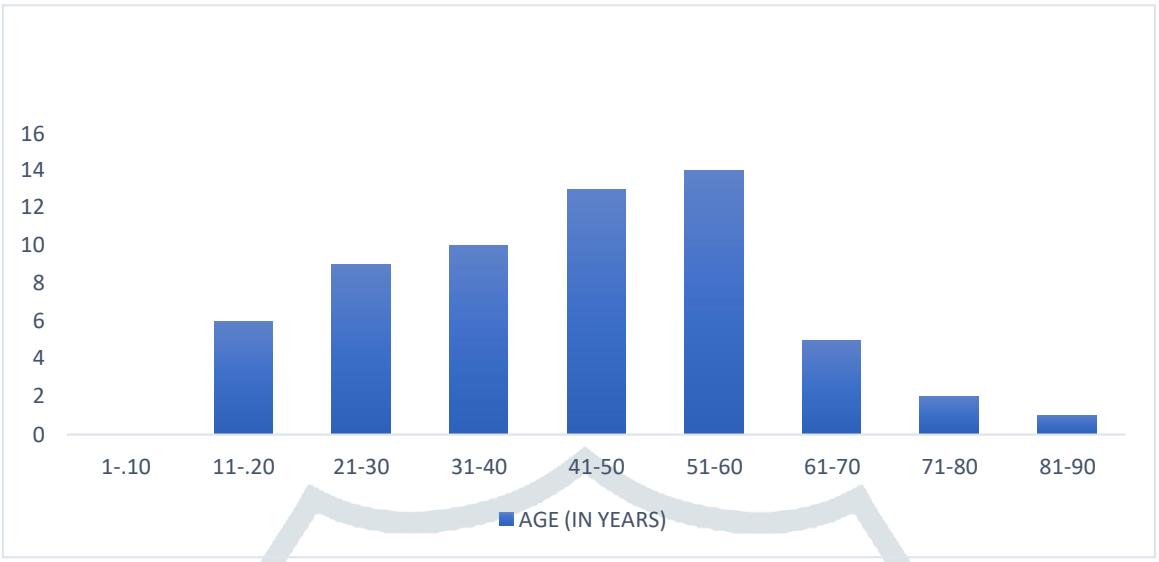

Figure 7 - Age wise distribution of inpatients in surgicalspecialities

Figure 7 shows that highest number of patients with surgeries are between age groups 41 to 60 followed by the age groups 21 to 40.

Age wise distribution of patients exceeding ALOS in surgical specialities

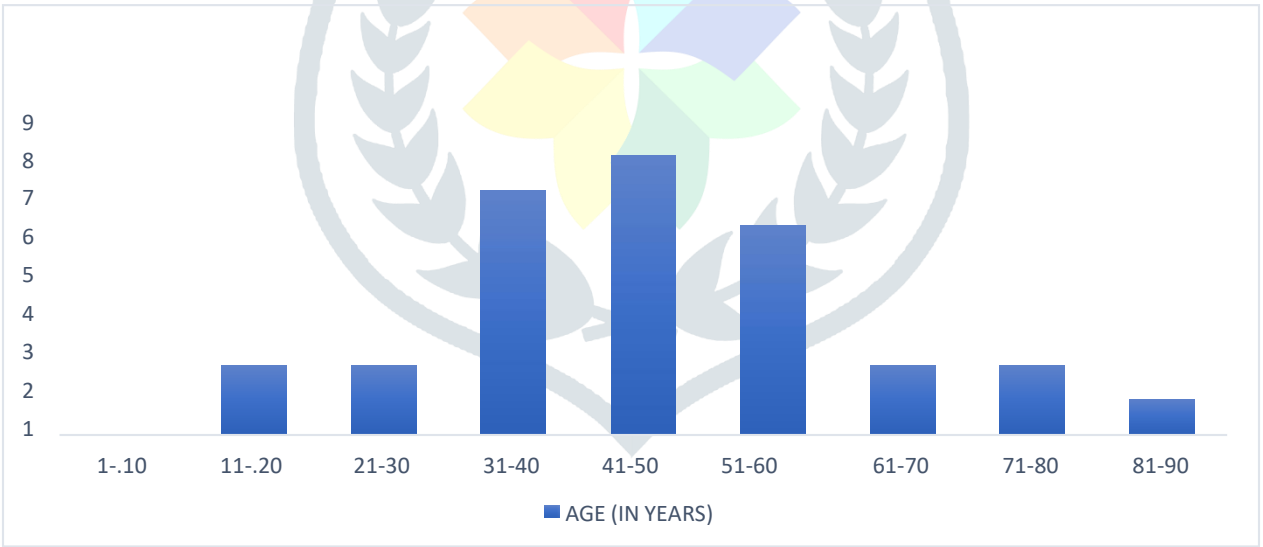

Figure 8 - Age wise distribution of patients exceeding ALOS in surgical specialities

From figure 8 we can observe that majority of patients who exceeded the mean ALOS in surgical specialities lie between the ages of 31- 60 years.

Diagnosis of outliers in medical specialities using mean

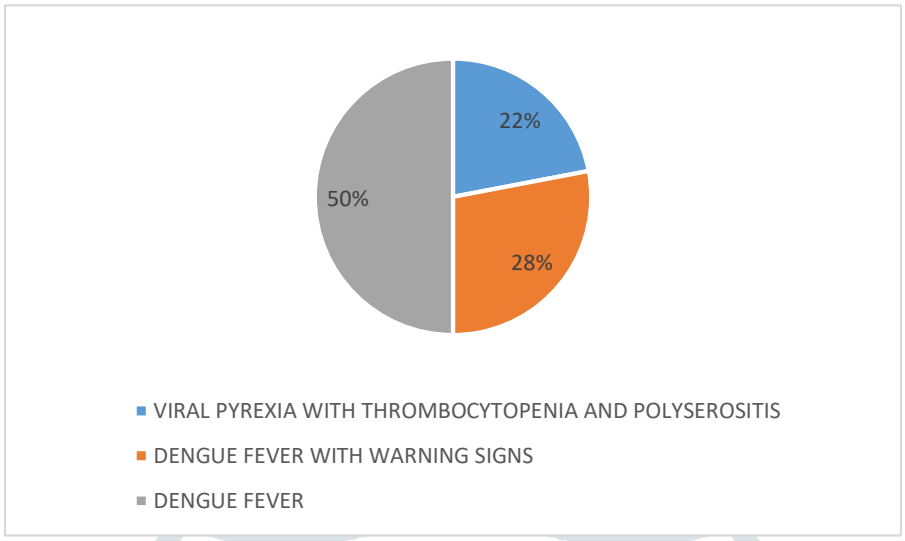

Figure-9 Diagnosis of patients exceeding ALOS in medical specialities using mean

From the outliers found by using mean ALOS in medical specialities as observed in figure 9, majority of cases are Dengue fever and Viral pyrexia.

Diagnosis of outliers in surgical specialities by using mean

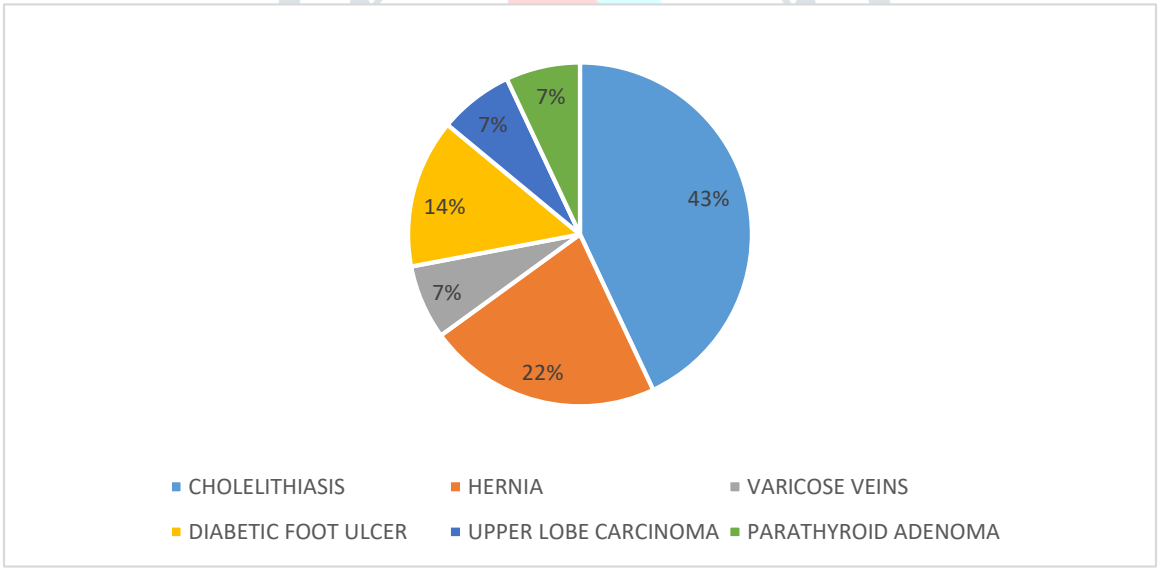

Figure-10 Diagnosis of patients exceeding ALOS in surgical specialities using mean

From the outliers found by using mean ALOS in surgical specialities(figure 10), 43% of cases are cholelithiasis, 22% of cases are hernia, 7% of cases are varicose veins, 7 % of cases are parathyroid adenoma, 7% of cases are upper lobe carcinoma and 14 % of cases are diabetic foot ulcers.

Diagnosis of patients exceeding in ALOS in ENT surgeries

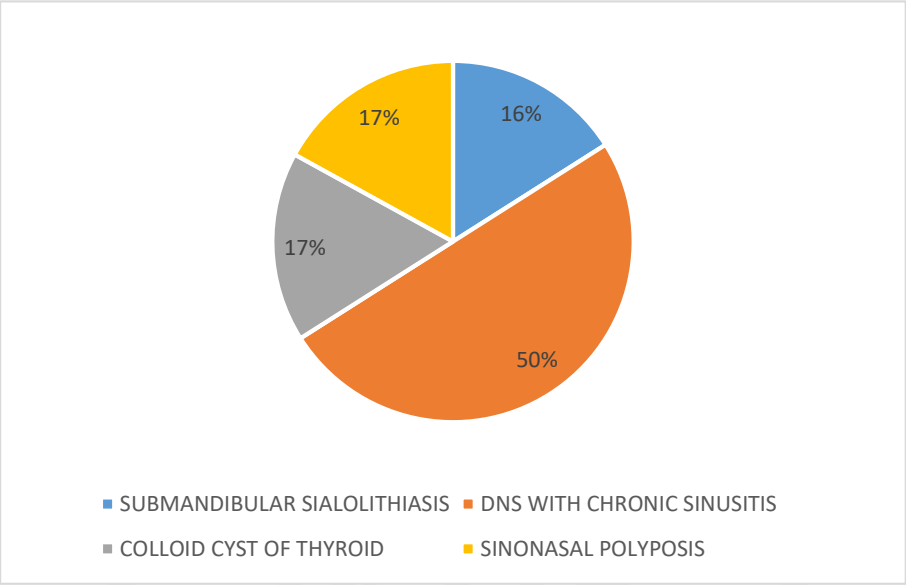

Figure 10- Diagnosis of patients exceeding in ALOS in ENT surgeries

From the outliers found by using mean ALOS in ENT surgeries(figure 10), 50% of cases are DNS with chronic sinusitis, 17% of cases are colloid cyst of thyroid, 17% of cases are sinonasal polyposis and 16% of cases are submandibular sialolithiasis.

Diagnosis of patients exceeding ALOS in cardiac surgeries

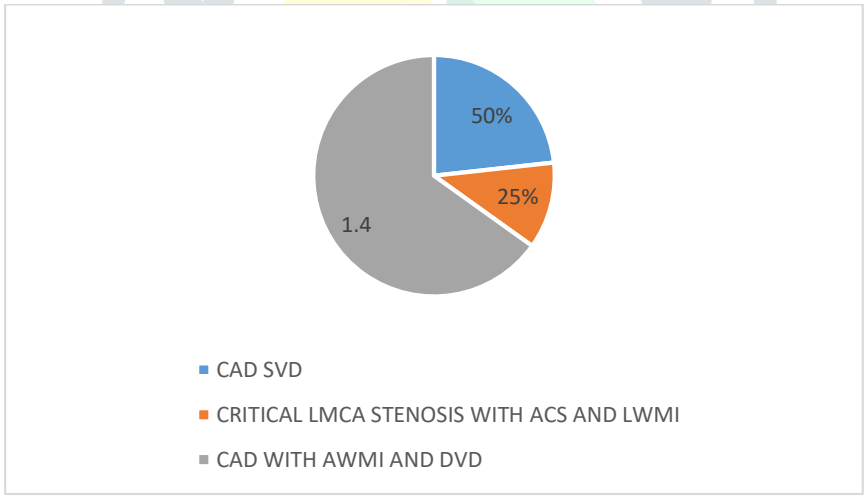

Figure 11- Diagnosis of patients exceeding ALOS in cardiac surgeries

From the outliers found by using mean ALOS in cardiac surgeries as per figure 11, 50% of cases are CAD SVD, 25% of cases are CAD with AWMI and DVD, 25% of cases are critical LMCA stenosis with ACS and LWMI.

Diagnosis of patients exceeding ALOS in orthopaedic surgeries

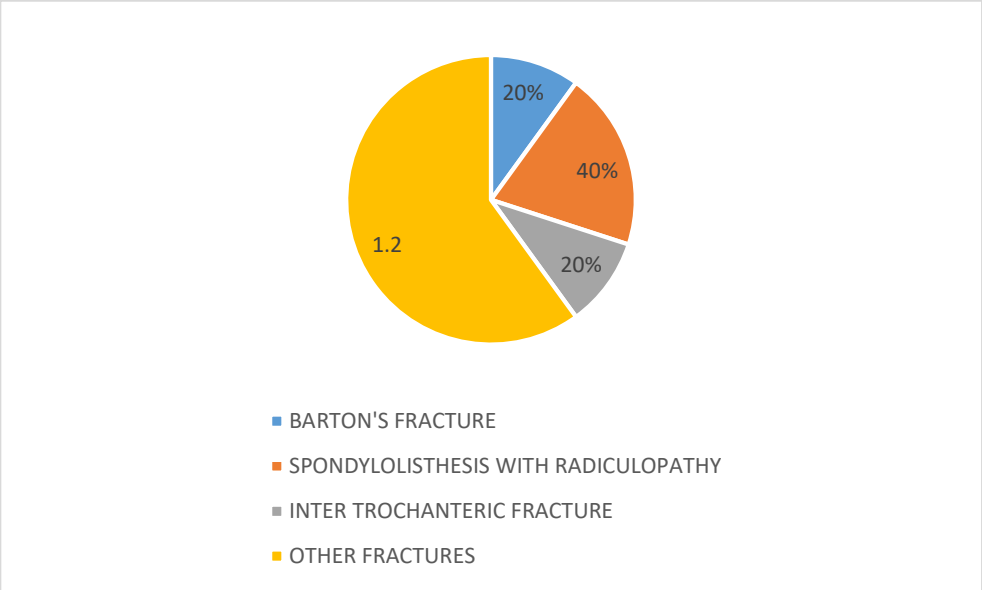

Figure 12 - Diagnosis of patients exceeding ALOS in orthopaedic surgeries

From the outliers found by using mean ALOS in orthopaedic surgeries as per figure 12, 40% of cases are spondylolisthesis with radiculopathy, 20% of cases are inter trochanteric fracture,20% include barton fractures, 20% include other fractures.

From outliers it is clearly evident that:

- A large pie is occupied by cases of dengue fever and viral pyrexia in medical specialities and by cases of Cholelithiasis and hernia in surgical specialities incomparison with other diagnosis.
- There are more number of male inpatients in medical specialities and female inpatients in surgical specialities.
- Majority of patients who exceeded the mean ALOS in medical specialities lie betweenthe age of 11-40 years and majority of patients who exceeded the mean ALOS in surgical specialities lie between the ages of 31-60 years.

Delays before surgery: The delays before surgery are because of the following reasons:

- Delay in diagnosis.
- Delays in payment.
- There are delays due to the medical condition where patient required opinions from various specialties on his condition.
- Patient medical condition is not suitable for surgery. Patient needs stabilization before performing any procedure.
- Delays due to surgeon’s unavailability.
- Unavailability of operation theatre.
- Delays in pre anaesthetic check-up of the patient

Delays due to mode of payment

Table 1 - Delays due to mode of payment

CASH	AROGYASRI	HEALTH INSURANCE
Delays due to patient's socio economic status.	Delay in claims due to insufficient staff number. Delays in diagnosis and test reports. Restlessness of staff due to work load. Disapproval of claims dueto medical condition of the patient or due to the fact thatsome procedures are not covered in the scheme.	Delays in applying for the policy due to limited human resources and heavy work load on them. Dual responsibilities assigned to the same staff. Delay in responsefrom the TPA's. Disapproval from thehealth insurance firms.

Delays after surgery: The delays after surgery are because of the following reasons:

- Delays in patient's recovery due to any underlying factors.
- Delay due to inherent complications of the procedure or condition of the patient aftersurgery.
- Some patients are not satisfied with shorter length of stay in the hospital and deny discharge.
- Delays in discharge process. Delay is seen in all the steps of discharge process for different cases like delay in planning for discharge, delay in chief doctors' advice, delay in writing discharge summary due to work load and for insurance patients, delay in applying for discharge and delay in approval from the TPA(Third party aaadministrators).
- In case of cash patients there are delays due to incomplete payments and delays in getting no dues from concerned departments.

SUGGESTIONS

Based on the study the following suggestions were made:

- Use predictive discharge methods to reduce variation and eliminate delays.
- Hospitals should restrict ALOS of the patients as per TPA (Third Party Administrator) standards to avoid delays.
- Reduce TAT (Turn Around Time) in processing claims.
- Improve hospital environment to reduce nosocomial infections.
- Strict aseptic condition should be followed.
- Abide Strict Patient Visiting policies.
- Increase efficiency of billing department.
- OT utilization should be planned properly.
- Delays are seen in specific diagnosis hence operating protocols can be changed regarding those procedures.
- Limit the staff members to one job role.

Limitations

- There are several contributing factors to lengthen the stay of the patient in the hospital. It may prove difficult to establish one or two factors as significant contributive factors.

- Incomplete data is available in few cases due to delays in receiving case files from concerned departments or from insurance desk or from the arogyasri cell.

Scope for further research

There is scope for further study by using the same data. Cost analysis can be done to know the effect of average length of stay on finances of hospital.

CONCLUSION

The various factors contributing to prolonged length of stay of the patients in the hospital include age, sex, diagnosis, mode of payment, comorbidities, complications that arouse or were already present, medical condition of the patient and any other delays like staff unavailability, operation theatre unavailability and delays in pre anaesthesia checkup. ALOS is found to be more in patients with credit payment than cash patients. Hospital acquired infections, delay in discharges also increase ALOS.

The Average Length of Stay (ALOS) is a crucial metric in the healthcare industry, offering valuable insights into care efficiency and hospital financing. A shorter ALOS proves instrumental in minimizing hospital costs, enhancing capacity optimization, and overall hospital efficiency. It allows for swift turnover of patients, ensuring that beds are available for new admissions and preventing unnecessary tie-up of resources. Moreover, a shorter stay can lead to a surge in revenue during the initial days of a patient's hospitalization, often characterized by various diagnostic and surgical procedures. Conversely, a longer ALOS can also have its advantages. It is associated with reduced re-admission rates and mortality rates, indicating comprehensive and attentive care provided to the patient during their extended stay. However, this needs to be balanced with the efficient use of hospital resources, especially the utilization of hospital beds, to maintain a delicate equilibrium between quality patient care and optimal resource allocation. Striking the right balance between ALOS and resource allocation is essential for sustaining a hospital's financial viability while ensuring exceptional patient care.

The length of stay (ALOS) in medical diagnostic procedures varies significantly based on the nature and severity of the illnesses. Chronic and severe disease episodes result in prolonged hospital stays, while communities grappling with a high prevalence of infectious diseases tend to have shorter ALOS. Hospital management has limited control over primary factors influencing ALOS, including the illness severity and patient conditions. However, secondary factors such as surgical scheduling, diagnostic procedures, healthcare environment for post-operative care, and institutional structures for managing chronic conditions do play a role in ALOS. Efficiently managing hospital beds and decreasing ALOS help in optimal utilization of hospital resources, aiding in preventing hospital-related infections and indicating high-quality care through swift patient recovery.

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