

Comparison Of The Effectiveness Of Various Surgical Interventions For Inguinal Hernia Repair In A Territory Care Hospital

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ABSTRACT

118 cases were gathered for the study, which was supported over six months at the KIMS hospital in Secunderabad. The data was obtained from patient case sheets from the gastrointestinal department where the patients received surgery.

A total of 118 subjects were enrolled in the research, for the study. From the total population considered in this study, 73 were males with a percentage of 61.86%, and 45 were females with a percentage of 38.14%. The rate of male patients is high when compared to female patients. The distribution is as follows 18 to 29 age group has 7 patients, the 30 to 39 age group has 19 patients, the 40 to 49 age group has 27 patients, the 50 to 59 age group has 25 patients, the 60 to 69 age group has 31 patients, 70 to 80 age group has 9 patients and their percentages are as follows 5.93%, 16.10%, 22.88%, 21.18%, 26.27%, 7.62% respectively. Out of these 102 members have comorbidities with a percentage of 86% and 16 members do not have any comorbidities denoting 14% of the total population. OHR shows an average recovery time of 10 – 21 days, LHR 7 – 10 days, and RALR 7 – 9 days of average recovery time.

In the present clinical study, Most cases (26.27%) were in the 60–69 age group, reflecting age-related muscle weakening and comorbidities, while the youngest age group (18–29) had the least cases (5.93%). Males accounted for 61.86% of cases, suggesting potential physiological or behavioral factors. 86% of patients had coexisting conditions, with hypertension (27.4%) and diabetes mellitus (16.6%) being the most common. These conditions likely exacerbate hernia risks by weakening the abdominal wall. Open Hernia Repair (OHR) was the most common procedure (49.15%), favored for its cost-effectiveness and suitability for older, high-risk patients. Laparoscopic Hernia Repair (LHR) (35.59%) and Robot-Assisted Laparoscopic Repair (RALR) (15.25%) were less frequent but offered benefits like shorter recovery times and less postoperative pain. OHR had the longest recovery time (10–21 days), while LHR and RALR patients recovered faster (7–10 and 7–9 days, respectively). Younger patients preferred LHR and RALR for their minimally invasive nature, while older patients opted for OHR. The study highlights the importance of tailoring surgical recommendations based on patient profiles, comorbidities, and recovery needs. Preventive strategies, including lifestyle modifications to reduce physical strain and smoking, can also lower hernia risks.

Keywords: Inguinal hernia, open hernia repair, laparoscopic hernia repair, robot-assisted laparoscopic repair, comorbidities,

I. INTRODUCTION

A **hernia** is a condition, in which an organ or tissue pushes through a weak spot or opening in the muscle or tissue that normally holds it in place, resulting in a visible bulge or lump.

Types of Hernias:

1. Inguinal Hernia:

- The most common type, occurs in the groin area.
- It occurs when a part of the intestine or fat from the abdomen pushes through the abdominal wall or into the inguinal canal, a passageway for structures like blood vessels and nerves.
- More common in men due to the natural weakness in the groin area created during fetal development.

2. Femoral Hernia:

- Less common, but more frequent in women.
- Occurs when tissue pushes through the femoral canal, present just below the groin.

- It is often harder to detect because of its location and can be at risk of strangulation (cutting off blood flow to the herniated tissue).
- 3. **Umbilical Hernia:**
 - Occurs near the belly button (umbilicus).
 - Common in newborns but can also occur in adults, particularly in those who are overweight or have had multiple pregnancies.
 - In adults, it often involves a small amount of intestine pushing through the abdominal wall near the navel.
- 4. **Incisional Hernia:**
 - It develops at the site of a previous surgical incision in the abdominal wall.
 - After surgery, the abdominal muscles may not heal properly, leading to a weakness where a hernia can form.
- 5. **Hiatal Hernia:**
 - Occurs when part of the stomach pushes up through the diaphragm into the chest cavity.
 - This can lead to symptoms like acid reflux, chest pain, or difficulty swallowing.
- 6. **Spigelian Hernia:**
 - A rare type of hernia that occurs along the edge of the rectus abdominis muscle (on the side of the abdomen).
 - Difficult to detect, and often causes pain in the lower abdomen.

TREATMENT:

• Annual Surgeries: In India, the number of inguinal hernia surgeries is substantial, with around 100,000 to 200,000 surgeries each year.

The country has a growing number of facilities offering laparoscopic surgery, which is increasingly being used for hernia repair. The primary categories of surgical techniques for inguinal hernia repair are:

1. **Open Inguinal Hernia Repair (OHR):** Open surgery has been the traditional approach to inguinal hernia repair. It involves making an incision near the hernia site to access and repair the defect, often with a mesh.
Types of Open Surgery:
 - **Lichtenstein repair (mesh-based):** A tension-free mesh is placed to reinforce the abdominal wall.
 - Shouldice repair: A tissue-based repair without mesh, which involves suturing the muscles and fascia.

Pros:

- Well-established technique with long-term data supporting its effectiveness.
- Lower initial costs due to fewer equipment requirements compared to laparoscopic surgery.
- Shorter operation times for simpler cases.
- Often used in cases where laparoscopic surgery is contraindicated.

Cons:

- Larger incision, leading to a longer recovery time compared to minimally invasive surgery.
- Potential for higher wound complications like infections or hematoma formation.
- May involve more post-operative pain compared to laparoscopic surgery.

Outcomes:

- Recurrence rate: Approximately 1-3%, depending on the technique and expertise.
- Recovery time: Typically 1-2 weeks for most activities.
- Complications: Includes infection, hematoma, and chronic pain, though rare in experienced hands.

2. Laparoscopic Inguinal Hernia Repair (LHR):

Laparoscopic surgery uses small incisions and specialized instruments, including a camera, to perform the repair. The most common technique is transabdominal preperitoneal (TAPP) or totally extraperitoneal (TEP) repair.

Pros:

- Minimally invasive: Smaller incisions, leading to less post-operative pain.
- Quicker recovery time, with most patients returning to normal activities within 1 week.
- Cosmetic benefits: Smaller scars.
- Better visualization: Laparoscopic repair provides an enhanced vision of the anatomy.

- Reduced post-operative pain: Likely due to the smaller incisions and less disruption of tissue.

Cons:

- Longer operating time: Compared to open surgery, laparoscopic repairs can take longer.
- Requires specific expertise and equipment, leading to higher costs.
- Potentially higher rates of injury to the bowel, blood vessels, and other structures due to the technical difficulty.
- Not suitable for all patients, particularly those with large hernias or other comorbidities.

Outcomes:

- Recurrence rate: Similar or slightly lower than open repair (1-2%).
- Recovery time: Faster than open repair, typically a few days to 1 week for light activities.
- Complications: Includes complications from the camera insertion, such as bowel or vascular injuries, though these are relatively rare.

3. Robotic-Assisted Laparoscopic Repair (RALR)

Pros:

This is a variant of laparoscopic surgery that uses robotic arms to assist with the procedure, providing enhanced precision and 3D visualization.

- Precision: Robotic systems allow for greater control, potentially reducing the risk of complications.
- Minimally invasive: Similar benefits to standard laparoscopic surgery, with smaller incisions and less pain.
- Enhanced dexterity for complex repairs, especially in obese or elderly patients.

Cons:

- Higher cost: Robotic systems are expensive, and not all hospitals have access to the technology.
- Longer procedure times: Due to the complexity of robotic systems.
- Requires specific training and expertise.

Outcomes:

- Recurrence rate: Similar to laparoscopic repairs (1-2%). complication rates due to better precision.
- Recovery time: Comparable to laparoscopic surgery, with faster recovery due to its minimally invasive nature.
- Complications: Similar to laparoscopic surgery, but potentially lower

II. REVIEW OF LITERATURE

1. Amid PK. Laparoscopic repair of inguinal hernia: a review of the literature. **Hernia**. 2004;8(2):99-103. doi:10.1007/s10029-004-0109-1.

The article by Amid PK, titled "*Laparoscopic repair of inguinal hernia: a review of the literature*" (published in *Hernia*, 2004), evaluates the outcomes, advantages, and challenges of laparoscopic inguinal hernia repair based on existing literature. **Challenges and Limitations: Operative Time**-Laparoscopic procedures typically require longer operative times, especially during the surgeon's learning curve. **Complications** - Higher risk of serious complications such as vascular or visceral injuries compared to open repair. Complication rates decrease significantly with surgeon experience. General Anesthesia - Requires general anesthesia, making it less suitable for patients who cannot tolerate it. Learning Curve-Proficiency in laparoscopic repair requires significant training and experience, which may limit its adoption in some settings.

2. HerniaSurge Group. International guidelines for groin hernia management. **Hernia**. 2018;22(1):1-165. doi:10.1007/s10029-018-1819-1.

The *HerniaSurge Group* published the *International Guidelines for Groin Hernia Management* in *Hernia* (2018), offering comprehensive, evidence-based recommendations for the diagnosis and treatment of groin hernias. These guidelines provide standardized approaches to improve patient outcomes globally. Acceptable for asymptomatic or minimally symptomatic hernias, especially in high-risk surgical patients. Approximately 70% of patients eventually require surgery due to symptom progression. **Women**-Prompt surgical repair is recommended for all groin hernias in women due to the higher prevalence of femoral hernias and associated complications. **Elderly Patients**-Tailored approaches considering comorbidities and surgical risk. **Athletes**-Emphasis on detailed evaluation to differentiate hernias from other causes of groin pain (e.g., sports hernias).

3. Fitzgibbons RJ, Forse RA. Groin hernias in adults. **N Engl J Med**. 2015;372(8):756-763. doi:10.1056/NEJMr1400485.

The article by Fitzgibbons RJ and Forse RA, titled "*Groin Hernias in Adults*" (published in *The New England Journal of Medicine*, 2015), provides a comprehensive overview of the epidemiology, diagnosis, and management of groin hernias in adults. Groin hernias, including inguinal and femoral hernias, are common, with a lifetime risk of 27% in men and 3% in women. Inguinal hernias account for the majority of cases, with femoral hernias being less common but more likely to lead to complications such as strangulation. Most cases are diagnosed clinically based on a history of a groin bulge or pain, often exacerbated by physical activity or straining. Imaging, such as ultrasound, CT, or MRI, is reserved for cases with diagnostic uncertainty, particularly in obese patients or those without a palpable hernia.

4. Liem MS, de Lange DC, Langenhuijsen JF, et al. A randomized controlled trial of laparoscopic versus open inguinal hernia repair in adults: the Dutch Hernia Trial. **Ann Surg**. 2004;240(2):322-330. doi:10.1097/01.sla.0000131576.67371.16.

The article by Liem MS, de Lange DC, Langenhuijsen JF, et al., titled "*A randomized controlled trial of laparoscopic versus open inguinal hernia repair in adults: the Dutch Hernia Trial*" (published in *Annals of Surgery*, 2004), presents a randomized controlled trial comparing laparoscopic and open inguinal hernia repair techniques. This trial highlights the importance of tailoring hernia repair techniques to individual patient needs, surgeon expertise, and healthcare resources. The findings reinforced the role of laparoscopic repair in advancing hernia surgery, particularly for complex cases. Laparoscopic repair offers significant advantages in terms of reduced pain, faster recovery, and better patient-reported outcomes, making it particularly suitable for patients with bilateral or recurrent hernias. Open Lichtenstein repair remains an effective and reliable choice, especially for primary unilateral hernias, due to its simplicity and cost-effectiveness.

5. Schug-Pass C, Böckler D, Bittner R. Open and laparoscopic inguinal hernia repair: a critical review of the literature. **World J Surg**. 2008;32(2):231-239. doi:10.1007/s00268-007-9337-7.

The article by Schug-Pass C, Böckler D, and Bittner R, titled "*Open and laparoscopic inguinal hernia repair: a critical review of the literature*" (published in *World Journal of Surgery*, 2008), critically evaluates the advantages, disadvantages, and outcomes of open and laparoscopic techniques for inguinal hernia repair based on a review of existing literature. **Advantages**-Reduced postoperative pain and lower risk of chronic pain compared to open repair. Faster recovery and earlier return to work or normal activities. It is particularly beneficial for bilateral and recurrent hernias after prior open repair. **Disadvantages**- Higher risk of serious complications such as visceral and vascular injury, especially during the surgeon's learning curve, Longer operative times and higher initial costs, and Requires general anesthesia.

III. AIMS AND OBJECTIVES

AIM: To identify the effectiveness of various surgical interventions for inguinal hernia repair in a tertiary care hospital, Secunderabad.

OBJECTIVES:

PRIMARY OBJECTIVE: To provide clarity on the relative advantages and disadvantages of each surgical intervention, ultimately guiding surgeons and policymakers in selecting the most appropriate and effective treatment strategies.

SECONDARY OBJECTIVE:

- To increase cost-effectiveness and healthcare resource optimization.
- To focus on postoperative outcomes and quality of life of the patient.
- To evaluate the safety and efficacy of various surgical procedures being used in the treatment of inguinal hernia.

IV. METHODOLOGY

Study design and study period:

- It is a prospective, observational study to be conducted in KIMS hospital, Secunderabad.
- The study is proposed to be conducted for 6 months.

Source of data:

Data would be collected from treatment charts, case sheets, and laboratory data of the subjects included in the study.

Sample size:

The estimated sample size is about 118 patients.

Inclusion criteria:

The study includes if the subject satisfies the following criteria.

- Inpatients.
- subjects with comorbidities.
- Age - above 18 years.
- All Genders.

Exclusion criteria:

- Pediatric patients.
- Patients who are not willing to give consent.
- Emergency cases.
- Pregnant women.
- Age - above 80 years.

V. RESULTS

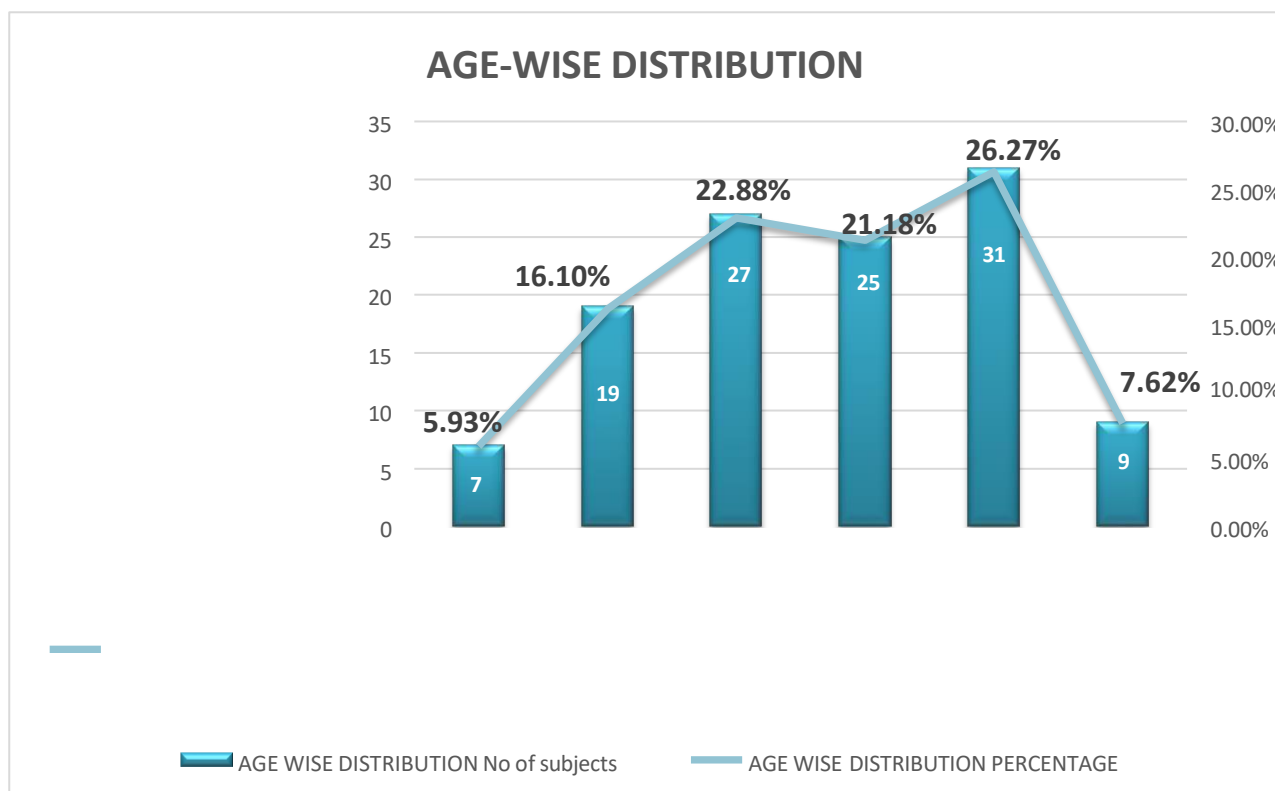
Over six months, 118 cases were gathered in the KIMS Hospital, Secunderabad to make the following

assessment.

Table 1: AGE - WISE DISTRIBUTION
AGE - WISE DISTRIBUTION

AGE IN YEARS	NO. OF SUBJECTS	PERCENTAGE
18 - 29	7	5.93%
30 - 39	19	16.10%
40 - 49	27	22.88%
50 - 59	25	21.18%
60 - 69	31	26.27%
70 - 80	9	7.62%

Figure 1: AGE-WISE DISTRIBUTION



	18 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 80
No Of subjects	7	19	27	25	31	9
AGE WISE DISTRIBUTION PERCENTAGE	5.93%	16.10%	22.88%	21.18%	26.27%	7.62%

A total of 118 participants were enrolled in the study, they have been categorized based on their age groups. The distribution is as follows 18 to 29 age group has 7 patients, the 30 to 39 age group has 19

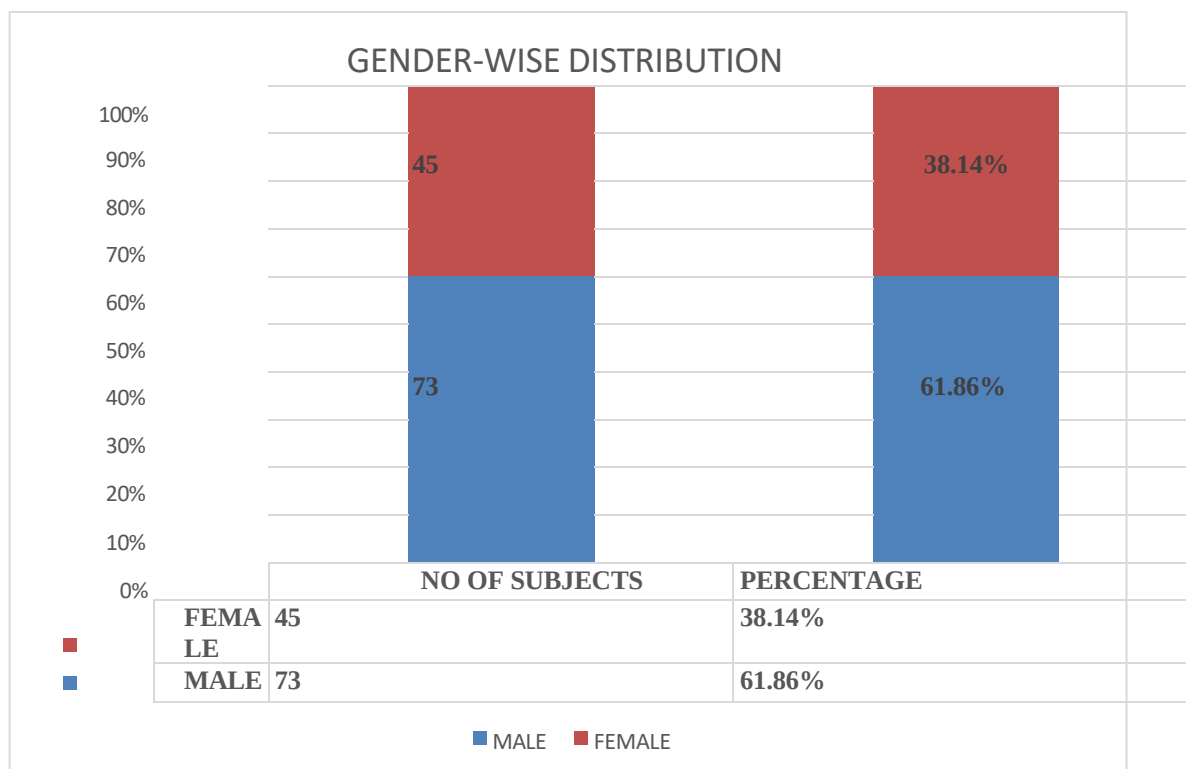
patients, the 40 to 49 age group has 27 patients, the 50 to 59 age group has 25 patients, the 60 to 69 age group has 31 patients, 70 to 80 age group has 9 patients and their percentages are as follows 5.93%, 16.10%, 22.88%, 21.18%, 26.27%, 7.62% respectively.

Table 2: GENDER - WISE DISTRIBUTION

GENDER WISE DISTRIBUTION

GENDER	NO OF SUBJECTS	PERCENTAGE
MALE	73	61.86%
FEMALE	45	38.14%

Figure 2: GENDER - WISE DISTRIBUTION



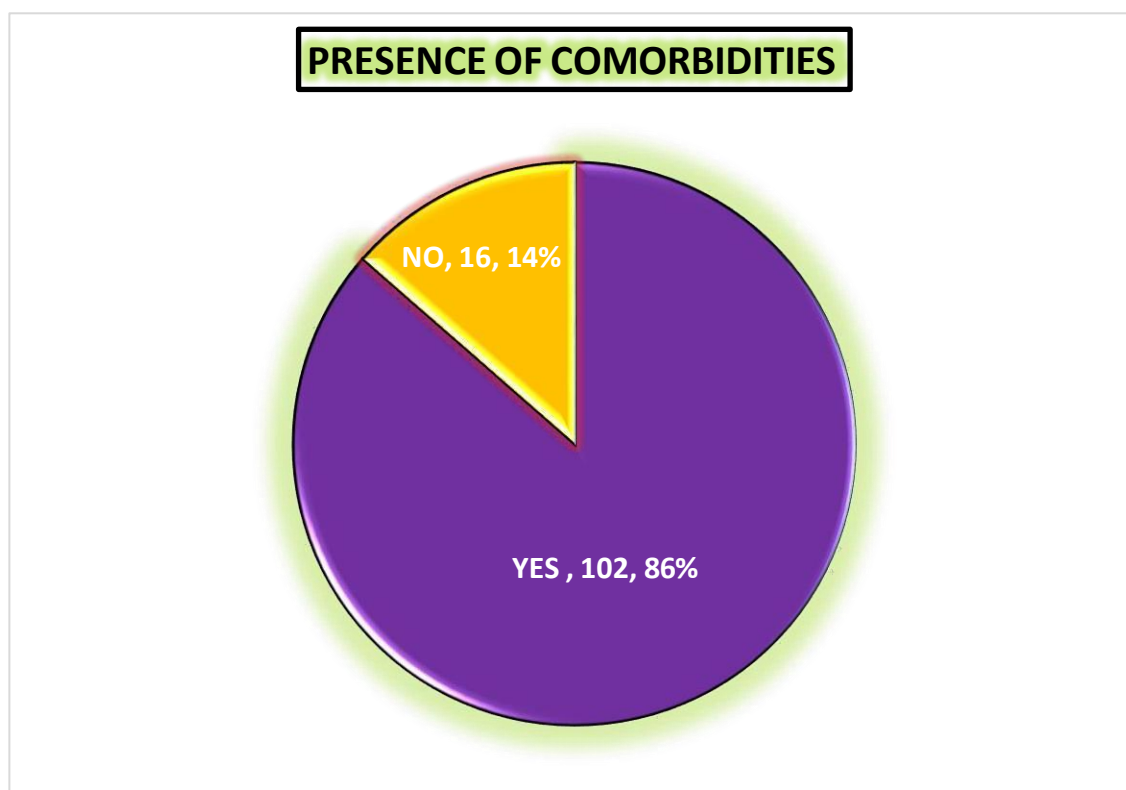
From the total population considered in this study, 73 were males with a percentage of 61.86%, and 45 were females with a percentage of 38.14%. The percentage of male patients is high when compared to female patients.

Table 3: PRESENCE OF COMORBIDITIES

PRESENCE OF COMORBIDITIES

COMORBIDITIES	NO OF SUBJECTS	PERCENTAGE
YES	102	86%
NO	16	14%

Figure 3: PRESENCE OF COMORBIDITIES



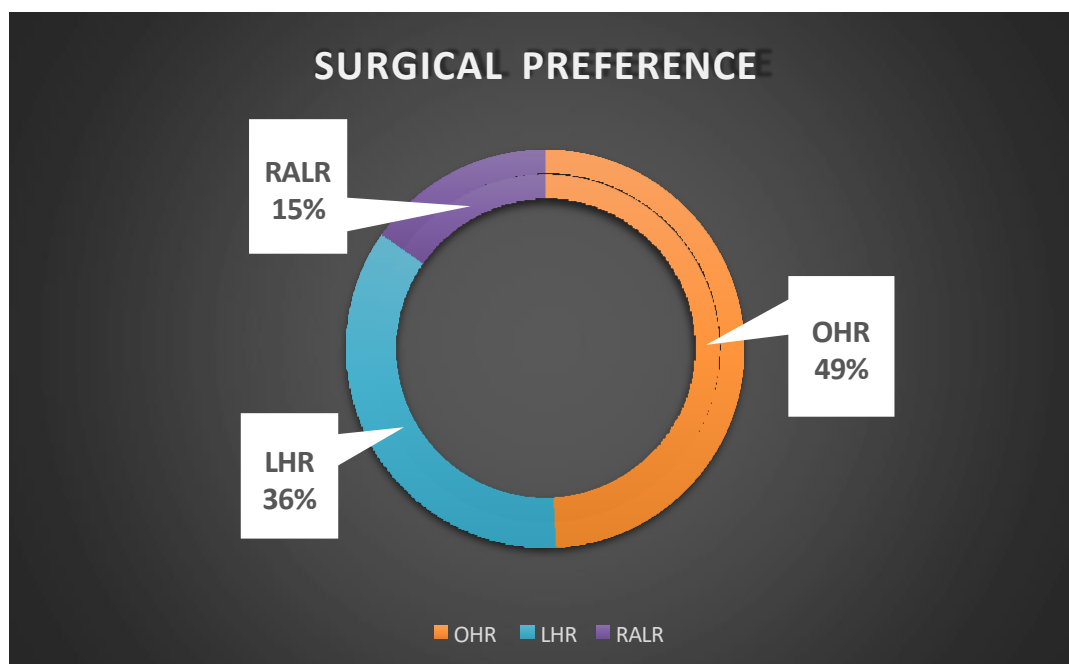
In the total number of subjects, 102 members have comorbidities with a percentage of 86% and 16 members do not have any comorbidities denoting 14% of the total population.

Table 4: SURGICAL PREFERENCE

SURGICAL PREFERENCE

NAME OF THE SURGERY	NO OF PATIENTS	PERCENTAGE
OHR	58	49.15%
LHR	42	35.59%
RALR	18	15.25%
TOTAL	118	100.00%

Figure 4: SURGICAL PREFERENCE



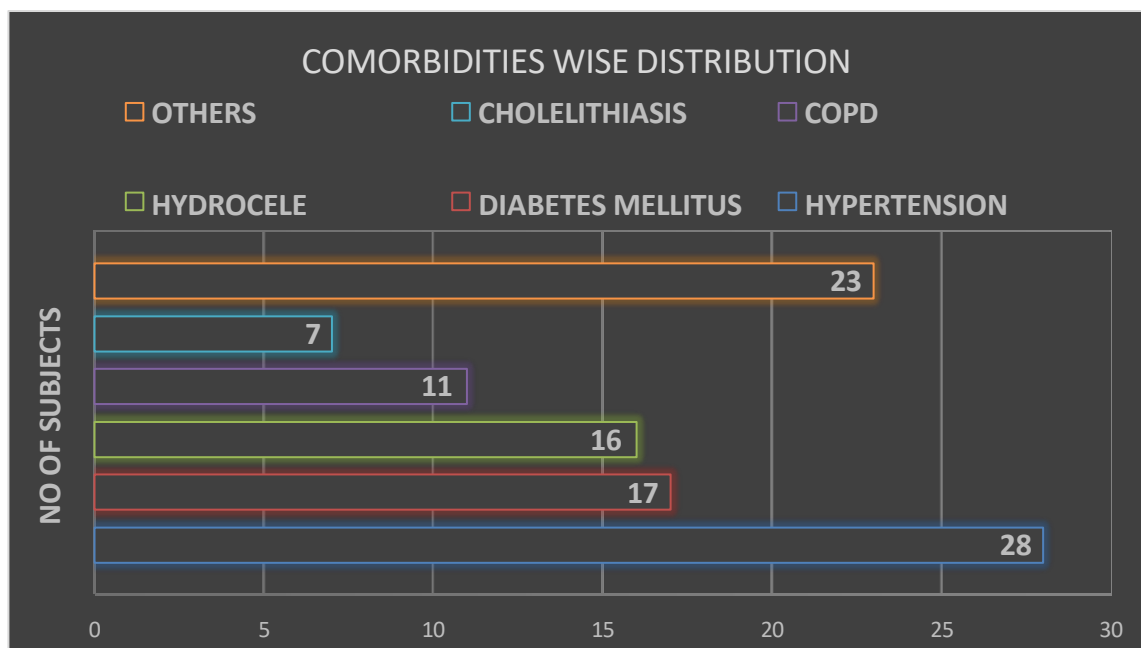
Considering the classification of the SURGERY undergone, out of 118 samples, 58 (49%) underwent OHR, 42 (36%) underwent LHR, and 18 (15%) underwent RALR.

Table 5: COMORBIDITIES WISE DISTRIBUTION

COMORBIDITIES WISE DISTRIBUTION

COMORBIDITY	NO. OF SUBJECTS	PERCENTAGE
HYPERTENSION	28	27.40%
DIABETES MELLITUS	17	16.60%
HYDROCELE	16	15.60%
COPD	11	10.70%
CHOLELITHIASIS	7	6.86%
OTHERS	23	22.50%

Figure 5: COMORBIDITIES WISE DISTRIBUTION



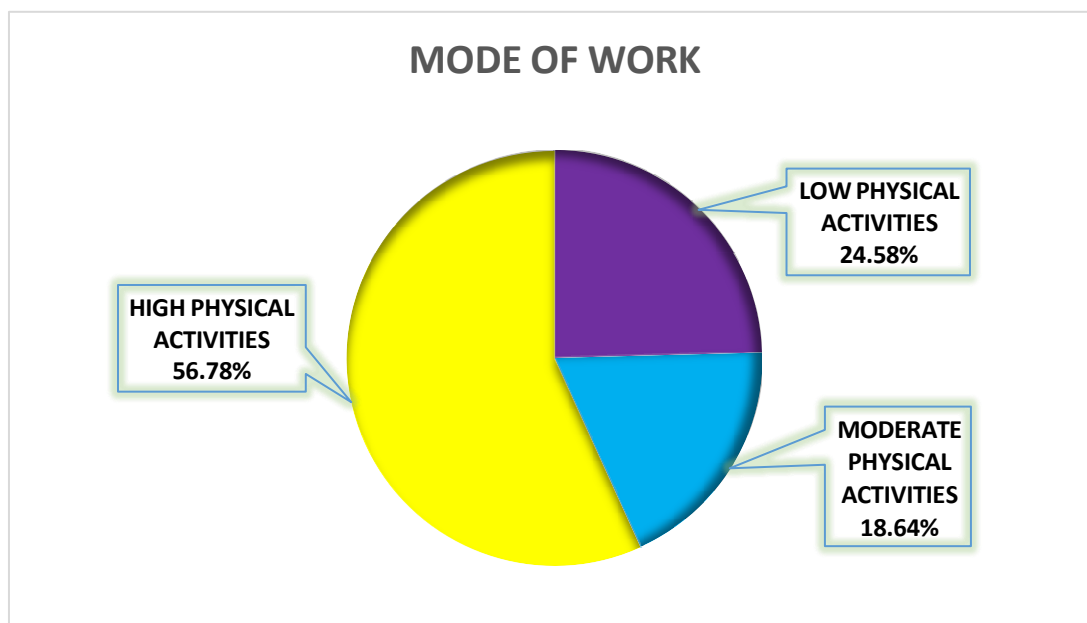
This table shows the comorbidities associated with hernia in the chosen sample of the population. 28 patients have hypertension, 17 - diabetes mellitus, 16 - hydrocele, 11 - copd, 7 - cholelithiasis, and 23 - other ailments including migraines, constipation, muscle weakness, nervous breakdown, etc.

Table 6: MODE OF WORK

MODE OF WORK

SEVERITY OF WORK	NO OF PATIENTS	PERCENTAGE
LOW PHYSICAL ACTIVITIES (LPA)	29	24.57%
MODERATE PHYSICAL ACTIVITIES (MPA)	22	18.64%
HIGH PHYSICAL ACTIVITIES (HPA)	67	56.77%

Figure 6: **MODE OF WORK**



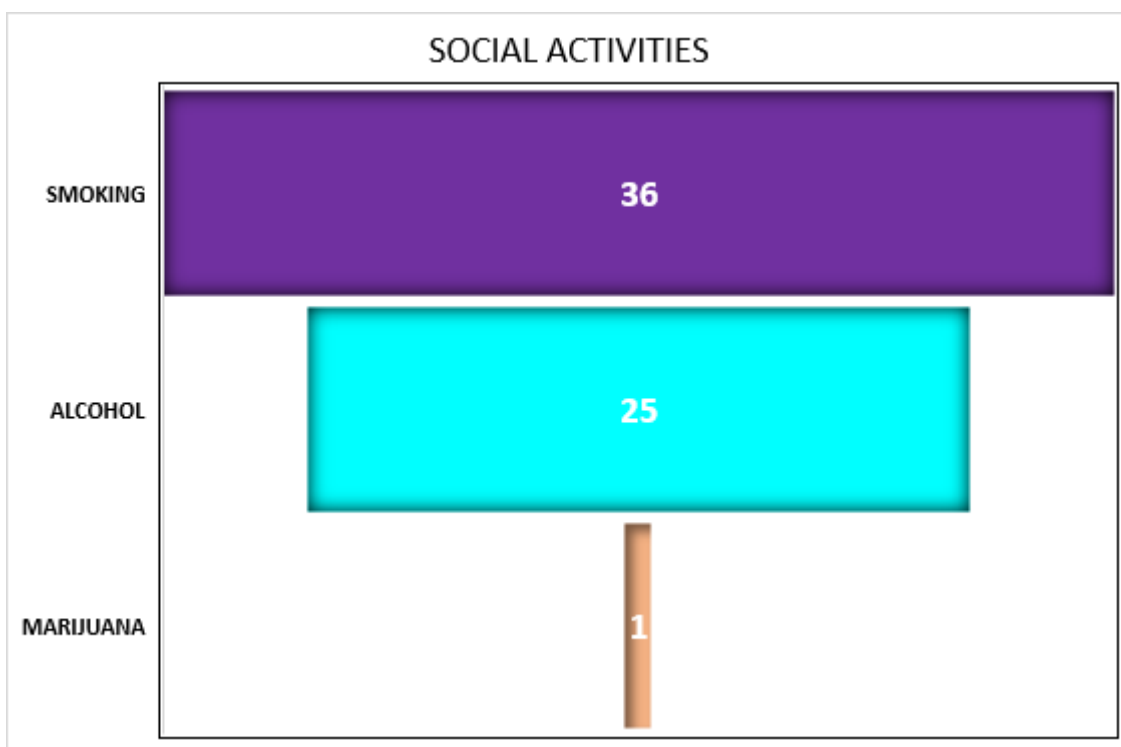
The above pie chart describes the severity of the physical work the subject does daily. High physical activity is done by 56.78% of the sample, moderate physical activity is done by 18.64%, and low physical activity is done by 24.58%.

Table 7: SOCIAL ACTIVITIES

SOCIAL ACTIVITIES

SOCIAL HABIT	NO OF PATIENTS	PERCENTAGE
SMOKING	36	30.50%
ALCOHOL	25	21.18%
MARIJUANA	1	0.84%

Figure 7: SOCIAL ACTIVITIES



Based on our analysis of 118 patients, 36 have the habit of smoking which contributes 30.5% of the sample size, 25 have the habit of alcohol which contributes 21.18%, and the marijuana habit is very rare and comprises 0.84%.

Table 8: SURGERY ENROLLMENT

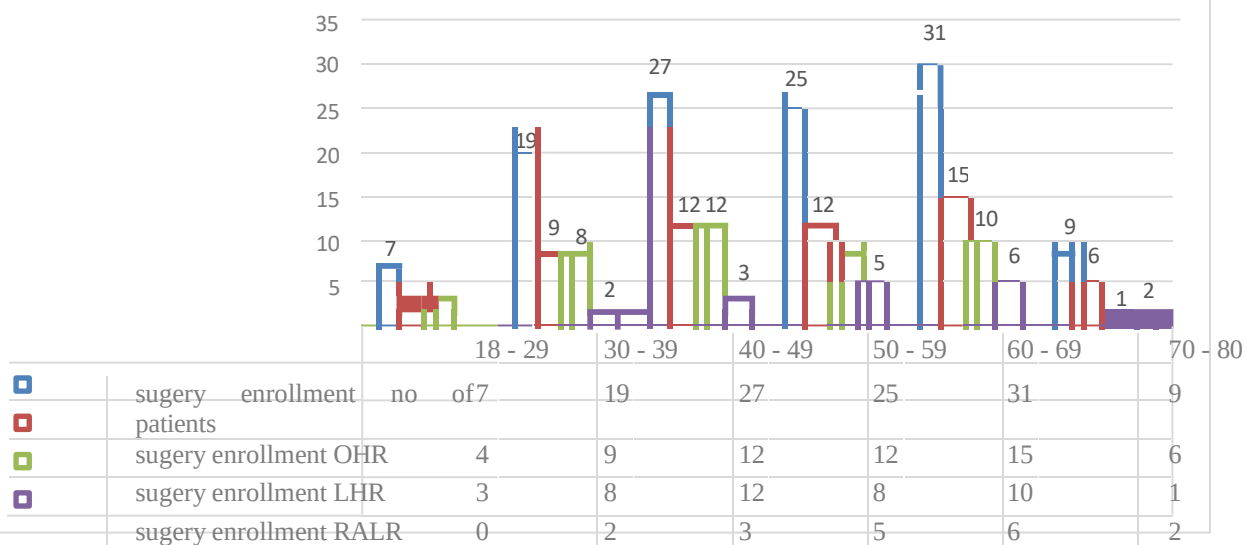
SURGERY ENROLLMENT

AGE GROUP	NO OF PATIENTS	OHR	LHR	RALR

18 - 29	7	4	3	0
30 - 39	19	9	8	2
40 - 49	27	12	12	3
50 - 59	25	12	8	5
60 - 69	31	15	10	6
70 - 80	9	6	1	2

Figure 8: SURGERY ENROLLMENT
SURGERY ENROLLMENT

■ sugery enrollment no of patients ■ sugery enrollment OHR ■ sugery enrollment LHR ■ sugery enrollment RALR



It has been conveyed that 118 people were chosen to participate in the study. This table describes the surgeryenrollment of different age groups in OHR, LHR, and RALR respectively.

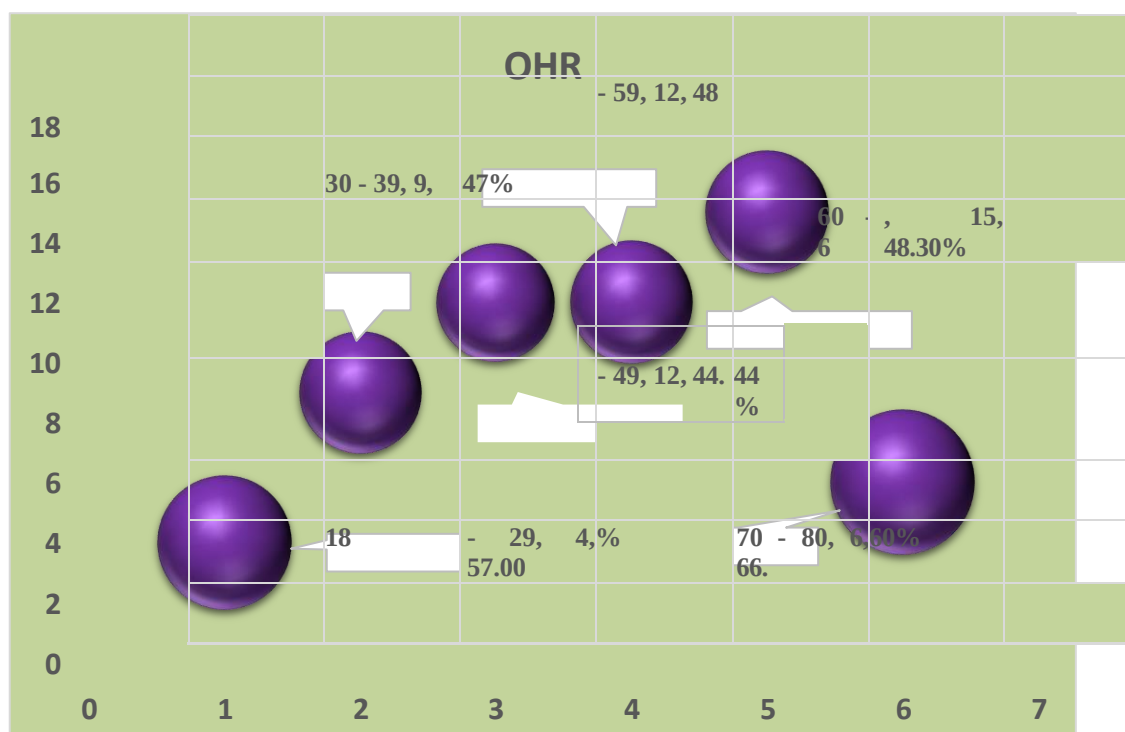
Table 9: OHR ENROLLMENT

OHR

AGE GROUP	NO OF PATIENTS	OHR	PERCENTAGE
18 - 29	7	4	6.89%
30 - 39	19	9	15.5%

40 - 49	27	12	20.6%
50 - 59	25	12	20.6%
60 - 69	31	15	25.8%
70 - 80	9	6	10.3%

Figure 9: OHR ENROLLMENT



Based on our data, the above table shows the percentages of patients enrolled in OHR of different age group categories.

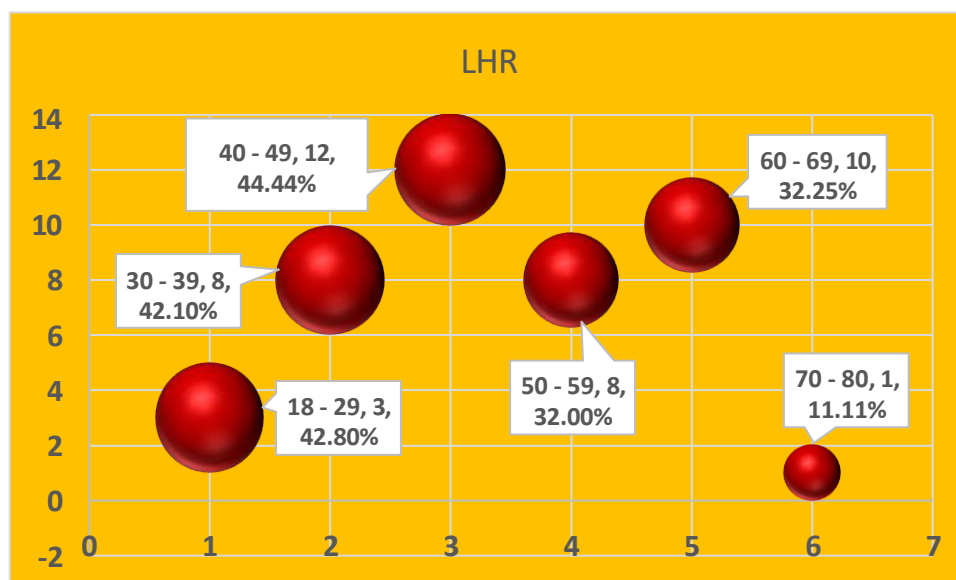
Table 10: LHR ENROLLMENT

LHR

AGE GROUP	NO OF PATIENTS	LHR	PERCENTAGE
18 - 29	7	3	7.14%
30 - 39	19	8	19.04%

40 - 49	27	12	28.5%
50 - 59	25	8	19.04%
60 - 69	31	10	23.8%
70 - 80	9	1	2.3%

Figure 10: LHR ENROLLMENT



Based on our data, the above table shows the percentages of patients enrolled in LHR of different age group categories.

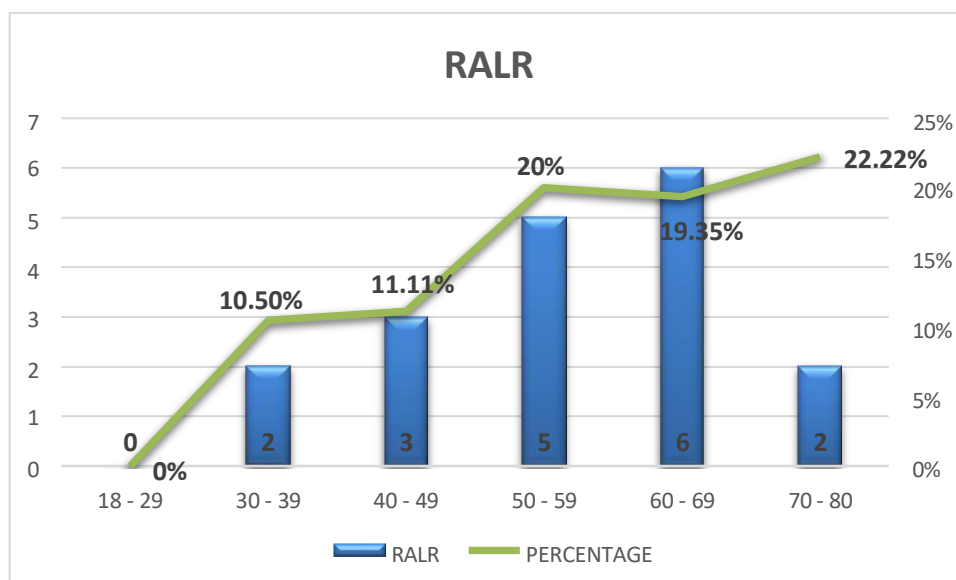
Table 11: RALR ENROLLMENT

RALR

AGE GROUP	NO OF PATIENTS	RALR	PERCENTAGE
18 - 29	7	0	0%
30 - 39	19	2	10.50%
40 - 49	27	3	11.11%
50 - 59	25	5	20%

60 - 69	31	6	19.35%
70 - 80	9	2	22.22%

Figure 11: RALR ENROLLMENT



Based on our data, the above table shows the percentages of patients enrolled in RALR of different age group categories.

Table 12: RECOVERY TIME IN WEEKS

RECOVERY TIME IN WEEKS			
AGE GROUP	OHR	LHR	RALR
18 - 29	1 - 2 weeks	1 week	1 week
30 - 39	1 - 2 weeks	1 week	1 week
40 - 49	1 - 3 weeks	1 - 1.5 weeks	1 week
50 - 59	2 - 3 weeks	1 - 1.5 weeks	1 - 1.5 weeks

60 - 69	2 - 4 weeks	1 - 2 weeks	1 - 1.5 weeks
70 - 80	3 - 4 weeks	1 - 2 weeks	1 - 2 weeks
AVERAGE	1.6 - 3 WEEKS	1 - 1.5 WEEKS	1 - 1.3 WEEKS

The above table shows the recovery time in weeks among different age group categories. In OHR opted group of people (18 - 29) shows 1 - 2 weeks of recovery time, (30 - 39) shows 1 - 2 weeks of recovery time, (40 - 49) show 1 - 3 weeks of recovery time, (50 - 59) shows 2 - 3 weeks of recovery time, (60 - 69) shows 2 - 4 weeks of recovery time, (70 - 80) shows 3 - 4 weeks of recovery time. In LHR opted group of people (18 - 29) shows 1 week of recovery time, (30 - 39) show 1 week of recovery time, (40 - 49) show 1 - 1.5 weeks of recovery time, (50 - 59) shows 1 - 1.5 weeks of recovery time, (60 - 69) shows 1 - 2 weeks of recovery time, (70 - 80) shows 1 - 2 weeks of recovery time. In RALR opted group of people (18 - 29) shows 1 week of recovery time, (30 - 39) shows 1 week of recovery time, (40 - 49) show 1 week of recovery time, (50 - 59) show 1 - 1.5 weeks of recovery time, (60 - 69) shows 1 - 1.5 weeks of recovery time, (70 - 80) shows 1 - 2 weeks of recovery time. OHR shows an average recovery time of 1.6 - 3 weeks, LHR 1 - 1.5 weeks, and RALR 1 - 1.3 weeks of average recovery time.

TABLE 13: RECOVERY TIME IN DAYS

RECOVERY TIME IN DAYS

AGE GROUP	OHR	LHR	RALR
18 - 29	7 - 14 days	7 days	7 days
30 - 39	7 - 14 days	7 days	7 days
40 - 49	7 - 21 days	7 - 10 days	7 days
50 - 59	14 - 21 days	7 - 10 days	7 - 10 days
60 - 69	14 - 28 days	7 - 14 days	7 - 11 days
70 - 80	21 - 28 days	7 - 14 days	7 - 14 days
AVERAGE	10 - 21 DAYS	7 - 10 DAYS	7 - 9 DAYS

The above table shows the recovery time in terms of days among different age group categories. In OHR opted group of people (18 - 29) shows 7 - 14 days of recovery time, (30 - 39) shows 7 - 14 days of recovery time, (40 - 49) show 7 - 21 days of recovery time, (50 - 59) shows 14 - 21 days of recovery time, (60 - 69) shows 14 - 28 days of recovery time, (70 - 80) shows 21 - 28 days of recovery time. In LHR opted group of people (18 - 29) shows 7 days of recovery time, (30 - 39) shows 7 days of recovery time, (40 - 49) show 7 - 10 days of recovery time, (50 - 59) shows 7 - 10 days of recovery time, (60 - 69) shows 7 - 14 days of recovery time, (70 - 80) shows 7 - 14 days of recovery time. In RALR opted group of people (18 - 29) shows 7 days of recovery time, (30 - 39) shows 7 days of recovery time, (40 - 49) show 7 days of recovery time, (50 - 59) shows 7 - 10 days of recovery time, (60 - 69) shows 7 - 11 days of recovery time, (70 - 80) shows 7 - 14 days of recovery time. OHR shows an average recovery time of 10 - 21 days, LHR 7 - 10 days, and RALR 7 - 9 days of average recovery

time.

DISCUSSION

- This prospective, observational study is aimed to assess the suitable surgical method in the treatment of inguinal hernia, in a tertiary care hospital.
- The research was conducted in the General Medicine department of KIMS Hospital, Secunderabad.
- The study findings highlight the efficacy and safety of OHR, LHR, and RALR methods as supported by existing literature.
- The investigation followed well-defined inclusion and exclusion criteria, ensuring reliable and valid observations.
- A total of 118 patient samples, aged between 18 and 80 years, were collected for this research. The data collection included detailed patient profiles, subjective and objective findings, diagnostic evaluations, surgical regimens, outcomes, progress notes, and additional observations.
- The data was categorized based on key factors such as age, gender, and type of surgery undergone, ensuring comprehensive segmentation for analysis.
- This study provides an in-depth understanding of surgical methods available and reinforces the importance of efficacy and safety of procedures. It highlights the availability of extensive knowledge in relevant literature, which serves as a foundation for informed and effective clinical decisions.
- The highest number of cases (26.27%) occurred in the 60–69 age group, indicating that hernia prevalence increases with age. This could be linked to age-related weakening of muscle walls or comorbidities that exacerbate hernia risks.
- The youngest age group (18 – 29 years) had the least number of cases (5.93%), suggesting hernias are less common in younger individuals, possibly due to stronger muscle integrity and fewer comorbidities.
- Males accounted for 61.86% of cases, while females made up 38.14%. This could reflect differences in lifestyle, physiology, or healthcare-seeking behaviors between genders. Alternatively, this distribution might be influenced by the study's sample characteristics rather than population-wide prevalence.
- A striking 86% of patients had comorbid conditions, highlighting the strong association between hernias and other health issues.
- **Hypertension** (27.4%) was the most common comorbidity, followed by **Diabetes Mellitus** (16.6%). These conditions might weaken the abdominal wall, increasing susceptibility to hernias.
- Conditions like **Hydrocele** and **COPD** are directly or indirectly linked to intra-abdominal pressure changes, a known risk factor for hernias.
- The majority of patients (49.15%) underwent **Open Hernia Repair (OHR)**, which is a traditional and cost-effective method.
- OHR's popularity might stem from its accessibility, suitability for older patients, and its efficacy in treating large or complex hernias.
- **Laparoscopic Hernia Repair (LHR)** (35.59%) and **Robot-Assisted Laparoscopic Repair (RALR)** (15.25%) are less common but offer advantages like reduced recovery time, less pain, and smaller incisions.
- The choice of surgery could be influenced by factors like patient age, comorbidities, surgeon expertise, and financial considerations.
- Recovery times varied significantly between procedures.
- **OHR** patients had the longest recovery times, averaging **10 - 21 days** (1.6 - 3 weeks). This aligns with the invasive nature of the procedure.
- **LHR** patients recovered in **7 - 10 days** (1 - 1.5 weeks), offering a faster return to normalcy.
- **RALR** patients had the shortest recovery time, averaging **7 - 9 days** (1 - 1.3 weeks), reflecting the benefits of minimally invasive surgery.
- The recovery time differences are important for patient counseling. Younger and physically active individuals might prefer LHR or RALR for quicker recovery, while older or high-risk patients might lean toward OHR due to its established reliability.
- Over half of the participants (56.77%) reported high physical activity levels, which likely contribute to the development of hernias due to repetitive strain or heavy lifting. This underlines the need for preventive measures like education on proper lifting techniques and workplace ergonomics.
- Smoking (30.5%) and alcohol use (21.18%) were significant habits among the participants.

Smoking, in particular, may contribute to chronic coughing and weakened tissue, exacerbating hernia risks. Lifestyle interventions targeting these habits could help reduce hernia incidence.

- Younger patients (18 - 49 years) had higher percentages of LHR and RALR procedures, likely due to their minimally invasive nature and quicker recovery.
- Older patients (60+ years) predominantly underwent OHR, possibly due to the complexity of their hernias or existing comorbidities.
- Surgeons can use this data to recommend procedures based on patient profiles, balancing factors like age, comorbidities, and recovery priorities.
- Efforts to mitigate risk factors such as high physical strain and smoking could significantly reduce hernia occurrences.
- The shorter recovery times of LHR and RALR make them appealing, particularly for younger and working individuals. Expanding access to these techniques could improve patient outcomes.
- Hospitals can allocate resources and train surgeons in procedures like RALR, which are becoming increasingly popular due to their efficiency.

VI. CONCLUSION

1. Age-Wise Distribution:
 - Most patients (26.27%) were in the 60 - 69 age group, followed by the 40 - 49 age group (22.88%).
 - The lowest percentage (5.93%) belonged to the 18 - 29 age group.
2. Gender-Wise Distribution:
 - male patients constituted 61.86%, while Female patients were 38.14%, showing a higher prevalence of the condition among females.
3. Presence of Comorbidities:
 - A significant majority (86%) had comorbidities, with only 14% having none.
4. Surgical Preferences:
 - The most common surgical approach was Open Hernia Repair (OHR) (49.15%), followed by Laparoscopic Hernia Repair (LHR) (35.59%) and Robot-Assisted Laparoscopic Repair (RALR) (15.25%).
5. Comorbidities Distribution:
 - The leading comorbidities were Hypertension (27.4%), Diabetes Mellitus (16.6%), and Hydrocele (15.6%).
6. Mode of Work:
 - Over half (56.77%) engaged in high physical activity, indicating a potential occupational or lifestyle-related risk factor.
7. Social Activities:
 - Smoking (30.5%) was the most common habit, followed by alcohol consumption (21.18%). Marijuana use was negligible (0.84%).
8. Surgery Enrollment by Age:
 - Surgery enrollment varied across age groups. OHR was more prevalent in older age groups (70– 80 years: 66.6%), while LHR and RALR were more evenly distributed in younger age groups.
9. Recovery Times:
 - OHR: Longer average recovery time (10 - 21 days).
 - LHR: Moderate recovery time (7 - 10 days).
 - RALR: Shortest recovery time (7 - 9 days).

SUMMARY

- A hernia is a condition in which an organ or tissue pushes through a weak spot or opening in the muscle or tissue that normally holds it in place, resulting in a visible bulge or lump.
- Data collection was identified by using - Annexure - I (Patient Data Collection Form), Annexure - II (informed consent form).
- Recurrence-No significant difference in recurrence rates between laparoscopic and open mesh

repairs, though laparoscopic techniques may show better outcomes when performed by experienced surgeons.

- Postoperative Pain-Laparoscopic repair was associated with less postoperative pain and reduced risk of chronic groin pain compared to open repair.
- Recovery-Laparoscopic repair led to faster recovery and earlier return to normal activities.
- Complications-Laparoscopic techniques had a higher risk of serious complications, such as visceral or vascular injury, likely related to the learning curve for these procedures.
- Cost and Duration-Laparoscopic repair had higher operative costs and longer surgery times than open repair
- Most cases (26.27%) were in the 60 - 69 age group, reflecting age-related muscle weakening and comorbidities, while the youngest age group (18 - 29) had the least cases (5.93%).
- Males accounted for 61.86% of cases, suggesting potential physiological or behavioral factors.
- 86% of patients had coexisting conditions, with hypertension (27.4%) and diabetes mellitus (16.6%) being the most common.
- These conditions likely exacerbate hernia risks by weakening the abdominal wall.
- Open Hernia Repair (OHR) was the most common procedure (49.15%), favored for its cost-effectiveness and suitability for older, high-risk patients.
- Laparoscopic Hernia Repair (LHR) (35.59%) and Robot-Assisted Laparoscopic Repair (RALR) (15.25%) were less frequent but offered benefits like shorter recovery times and less postoperative pain.
- OHR had the longest recovery time (10 - 21 days), while LHR and RALR patients recovered faster (7 - 10 and 7 - 9 days, respectively).
- Younger patients preferred LHR and RALR for their minimally invasive nature, while older patients opted for OHR.
- The study highlights the importance of tailoring surgical recommendations based on patient profiles, comorbidities, and recovery needs. Preventive strategies, including lifestyle modifications to reduce physical strain and smoking, can also lower hernia risks.
- Expanding access to advanced techniques like RALR and training surgeons in these methods can enhance patient outcomes and recovery experiences.

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