

**Inguinal Hernia as a Health Problem in Elderly Males****B. G. Rahul<sup>1</sup>, G. Balamaddaiah<sup>2</sup>**<sup>1</sup>Associate Professor of General Surgery, Department of General Surgery, Viswabharathi Medical College, Kurnool<sup>2</sup>Associate Professor of General Surgery, Department of General Surgery, Viswabharathi Medical College, Kurnool

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Conflict of interest: Nil

**Abstract:**

**Background:** Among the elective General surgery procedures performed in a tertiary care Hospital, Inguinal Hernia was found to be the commonest. Hence a demographic audit was undertaken to find out whether it was a major health problem among the elderly individuals in this part of Andhra Pradesh. An attempt was made to study the clinical symptoms, signs and risk factors and final outcome of these procedures on Inguinal Hernia.

**Aim of the Study:** To study the demographic details, risk factors, clinical profile and methods of repair and final outcome in elderly patients with inguinal hernia.

**Methods:** 75 patients diagnosed as inguinal hernia, attending the Department of General surgery of a tertiary care Hospital. Demographic data, symptoms, signs, risk factors and type of surgery undertaken were collected. The final outcome of surgery in all the patients was analysed with a specific note on complications. The study was single center, prospective, non-randomized, analytical study.

**Results:** The Risk factors like Bronchial Asthma found in 14 (18.66%) patients, Constipation in 21 (28%) patients, Low BMI in 08 (10.66%) patients, Family history of hernias in 05 (06.66%) patients and weight lifting jobs in 04 (05.33%) patients. VAS score assessed in 75 patients was 0 to 03 was noted in 18 (24%) patients, 04 to 06 points was noted in 31 (41.33%) patients and 06 to 09 was noted in the remaining 27 (36%) patients. Herniorrhaphy was used as a surgical method to treat inguinal Hernia in 34 (45.33%) patients, in Herniorrhaphy with Mesh was used in 12 (16%) patients; Laparoscopic surgery was used in 12 (16%) patients and MIS Laparoscopic surgery in 16 (21.33%) patients.

**Conclusion:** In the General surgery practice Hernias are most common among the elderly populations. Heavy manual labourers and weight lifters are commonly affected. Swelling, altered bowel habits, pain and irreducibility are common presenting modes. Associated family histories, Bronchial Asthma are common risk factors. Indirect types of hernias are more common. Herniorrhaphy with or without reinforcement and/ or mesh are commonly performed surgeries. Inguinal hernias are a major Health problem in the elderly patients.

**Keywords:** Hernia, Inguinal, Direct and indirect inguinal, geriatric, weight lifting and constipation.

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**Introduction**

History of repair of Hernias dates back to 2500 BC from archaeological evidence at Saqqara city of Egypt. [1] Term Hernia was derived from the Latin word BUD. [2] In 1562 Gabrielle Falloppio described inguinal ligament differentiating the inguinal and femoral hernias. [3] In 1816 Hesselbach described the triangle bearing his name to distinguish various hernias. (The Direct and indirect hernias are above the inguinal ligament, the direct presenting medial to inferior epigastric vessels and femoral below inguinal ligament and medial to the femoral vessels), [4]. In 1889, Bassini revolutionized suturing the transversalis fascia, transverses abdominis muscle, and internal oblique muscle to the inguinal ligament which improved surgical outcomes. [5] In 1984, prosthetic repair

was introduced by Lichtenstein which was tension free by mesh to reinforce the posterior wall of the inguinal canal. [6] In 2007 minimally invasive approach through laparoscopy was used to repair Hernias of both types. [7] Currently many surgeons are undertaking laparoscopic herniorrhaphy using robotic technology and it is becoming popular. [8] Surgical correction of Hernias was advised always irrespective of presence or absence of symptoms during the 20th century (2006) was modified to watchful waiting during the 21<sup>st</sup> century [9] which emerged as a viable and safe alternative option for those patients who were asymptomatic or less symptomatic. The prevalence of inguinal hernias in India is somewhere between 198/ 10,000 population. [10] It increased with rise in the age

from 0.25% at 18 years to 4.5% at 75 to 80 years. [11] In India inguinal hernias constituted 97% of the groin hernia repairs (94.23% males, 05.77% females). Femoral hernias were more commonly reported in women (81.7%) when compared to men (28.3%), [12]. Risk factors such as elderly age, male gender and genetic susceptibility were commonly mentioned in the literature. [13]

The genetic predisposition was more commonly reported among the first degree relatives. [14] Bronchial Asthma, weight lifting and low BMI, associated thoracic or abdominal aortic aneurysm, persistent processes vaginalis, previous history of appendicectomy and collagen vascular disease were few more risk factors studied. [15] Clinical symptoms noticed in most of the patients are prominence in groin region (>75%), dull aching pain, sometimes associated with dragging pain or sensation of burning. [16]

Patients also complained of activities which increase intra-abdominal pressure (cough, sneeze, lifting weights or strain at defecation) resulted in increased pain. [17] The size of the hernia increased during such activities. [18] Reduction of hernia was reported in almost all the patients. [19] Apart from clinical examination in standing and lying postures, inserting index finger in the inguinal ring to feel for the cough impulse (upon Valsalva) are performed by all the surgeons. [20]

MRI and /or CT scan of abdomen with or without contrast are helpful in identifying the groin hernias when physical examination is insufficient. [21] The sensitivity and specificity values reported of MRI, CT, and US in the literature are 91%, 77%, and 56% & 92%, 25% and 0 respectively. [22] The present study was conducted to analyze the demographic details, risk factors, clinical profile and methods of repair and final outcome in elderly patients with inguinal hernia.

**Study Design:** A prospective, non-randomized analytical study.

**Study Setting:** Department of General Surgery, Viswabharathi Medical College Hospital, Kurnool

**Study Duration:** 15 months (January 2022 to May 2023).

**Study Population:** Patients attending the Department of General Surgery, Viswabharathi Medical College Hospital, Kurnool.

**Sampling sample size:** Sample size is calculated by the formula  $N = 4pq/d^2$ ;

Where  $p = 25\%$ , prevalence taken from the study

$q = 75\%$ ,  $d = 10$

Hence  $n = 75$

Between January 2022 and May 2023, 75 patients were operated for different types of inguinal Hernias. This analytical study was done to study the various demographic details, risk factors, clinical profile and methods of repair and final outcome in elderly patients with inguinal hernia. An institution ethics committee approvals was obtained and approve proforma was used for the study.

**Inclusion Criteria:** Patients aged between 50 years and 80 years were included. Patients of both genders were included. Patients admitted and diagnosed with inguinal hernia requiring and willing for surgical management were included.

**Exclusion Criteria:** Patients aged below 50 years and above 80 years were included. Patients had undergone appendicectomy were not included. Patients with any other surgery on the abdominal wall or groin were not included.

Patients with recurrent inguinal hernia were not included. Patients with incarcerated hernia were not included, Patients with physical or mental disorders were not included, Patients with impaired cognition were not included, Patients with usage of daily analgesics for any other illness were not included, and Patients refusing the consent to participate in this study were not included.

All the patients were subjected to thorough clinical history taking, examination of the abdomen and groin. Inguinal hernias were divided into direct and indirect types. All the risk factors and comorbidities were noted down. Patients complaining with pain in the groin preoperatively were graded on a numerical rating scale of 1 to 10 using the visual analog score.

Pain is graded into four categories depending upon the VAS scores as Nil = VAS score 0; Mild = VAS score 1-3; Moderate = VAS score 4-6; Severe = VAS score >6. All the laboratory tests including hematological, renal, liver and thyroid function tests were undertaken.

Radiological investigations like Ultrasound examination of the abdomen, CT scan, MRI wherever necessary were done especially in patients with suspected intra-abdominal tumours, extra-large inguinal hernias causing compressive symptoms. All surgeries were performed by the author of this study.

**Statistical analysis:** Descriptive statistics were used, where for nominal variables, numbers and percentages were used, while for numerical variables, the mean was calculated. The association between two nominal variables was tested by using the chi-square test. A p-value less than 0.05 were considered statistically significant.

## Results

In the present study out of 75 patients, 27 (36%) patients were aged between 50 and 60 years, 25 (33.33%) patients were aged between 50 and 60 years, and 23 (30.66%) patients were aged between 50 and 60 years. The mean age was  $54 \pm 05$  years. There were 71 (94.66%) males and 04 (05.33%) were females. The male to female ratio was 17.75:1. 42 (56%) patients were from urban areas and 33 (44%) from the rural areas. 31 (41.33%) patients belonged to low socio-economic group, 29 (38.66%) belonged to middle income group and 15

(20%) were from high income group. The BMI was between 18 and 25 in 38 (50.66%) patients and above 25 in 37 (49.33%) patients. Diabetes Mellitus was present in 51 (68%) patients and not present in 24 (32%) patients. Thyroid function tests were normal in 50 (66%) patients, Hypo function in (25.33%) and hyper function in 06 (08%) patients. (Table 1) T test calculator for single sample was used to find the statistical significance, the age and gender variables were found to be significant as the p value was  $<0.05$ . The remaining variables were not significant in this study.

**Table 1: Showing the demographic details of the subjects (n-75)**

Observation	Number	Percentage	P value
<b>Age</b>			
50 to 60	27	36.00	0.001
61 to 70	25	33.33	
71 to 80	23	30.66	
<b>Gender</b>			
Male	71	94.66	0.001
Female	04	05.33	
<b>Living</b>			
Urban	42	56.00	0.143
Rural	33	44.00	
<b>Socio-economy</b>			
Low	31	41.33	0.151
Middle	29	38.66	
High	15	20.00	
<b>BMI</b>			
18 to 25	38	50.66	0.131
Above 25	37	49.33	
<b>Diabetes Mellitus</b>			
<b>Present</b>	51	68.00	0.171
<b>Absent</b>	24	32.00	
<b>Thyroid functions</b>			
Normal	50	66.00	0.138
Hypo	19	25.33	
Hyper	06	08.00	

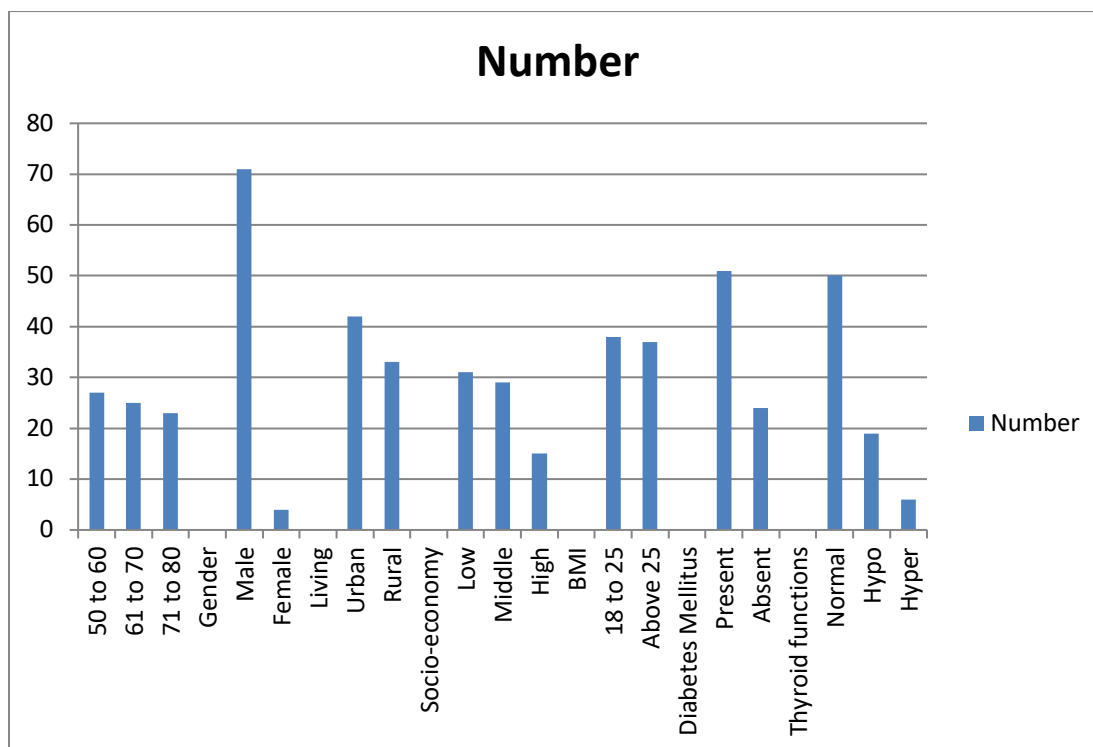


Figure 1: Showing the demographic details of the subjects (n-75)

Risk factors observed in the study were Bronchial Asthma in 14 (18.66%) patients, Constipation in 21 (28%) patients, Low BMI in 08 (10.66%) patients, Family history of hernias in 05 (06.66%) patients and weight lifting jobs in 04 (05.33%) patients. (Table 2) T test calculator for single sample was used to find the statistical significance of risk factors observed in the study, and found that variables were found to be not significant as the p value was <0.05.

Table 2: Risk factors observed in the study (n-75)

Risk Factors	Number	Percentage	P value
Bronchial Asthma	14	18.66	0.124
Constipation	21	28.00	0.211
Low BMI	08	10.66	0.301
Family history	05	06.66	0.152
Weight lifting jobs	04	05.33	0.221

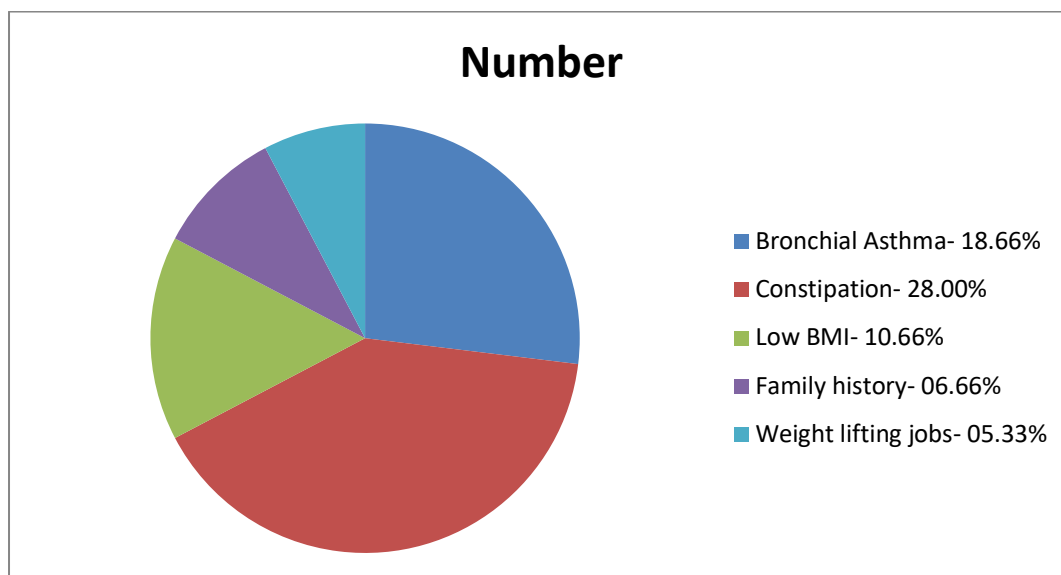


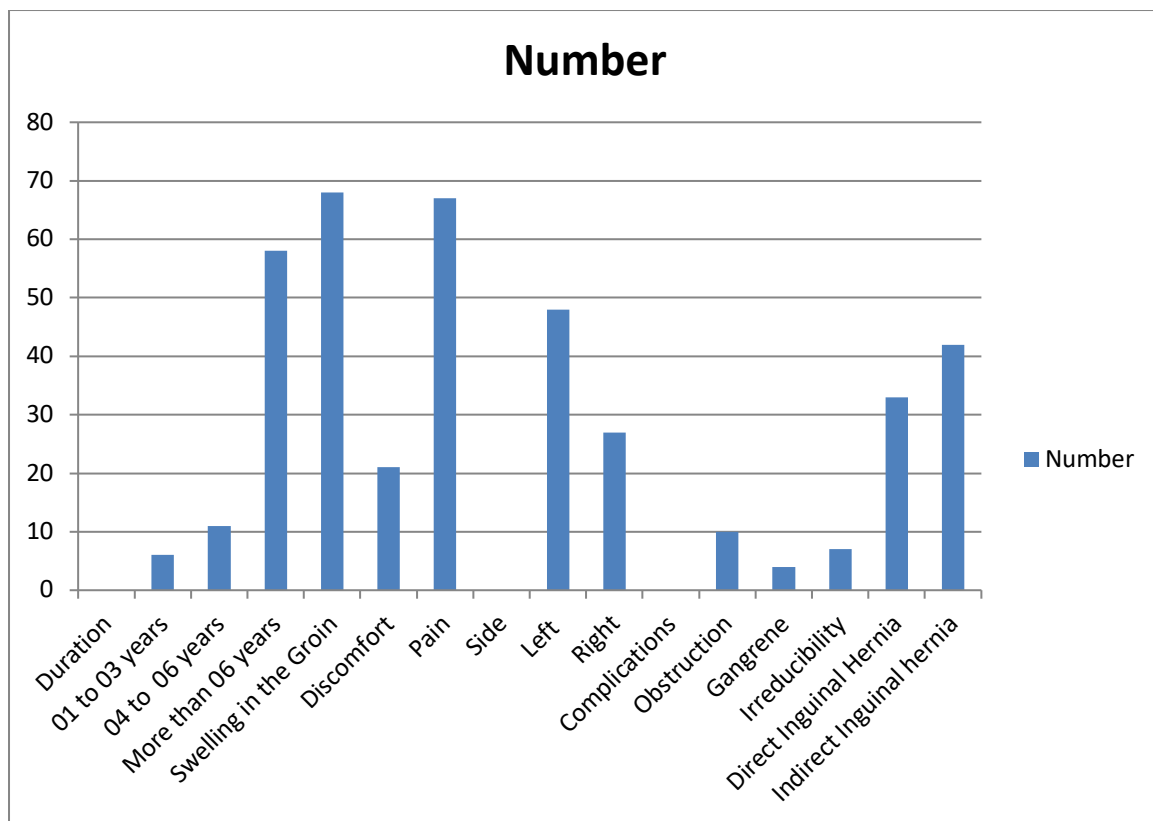
Figure 2: Risk factors observed in the study (n-75)

Among the 75 patients 06 (08%) had noticed the swelling between 01 and 03 years, 11 (14.66%) had noticed the swelling between 04 and 06 years, and in 58 (77.33%) the swelling was noted more than 06 years ago. Clinical symptoms noted in the subjects were swelling in the groin in 68 (96.66%) patients, discomfort in 21 (28%) patients, and pain in 67 (89.33%) patients. Left side inguinal Hernia was noted in 48 (64%) patients and right sided in 27 (36%) patients. Complications noted were

obstruction in 10 (13.33%) patients, Gangrene in 04 (05.33%) and irreducibility in 07 (09.33%) patients. Direct inguinal Hernia was noted in 33 (44%) patients and indirect inguinal Hernia was noted in 42 (56%) patients. (Table 3) T test calculator for single sample was used to find the statistical significance of clinical symptoms and signs observed in the study, and found that variables were found to be not significant as the p value was <0.05.

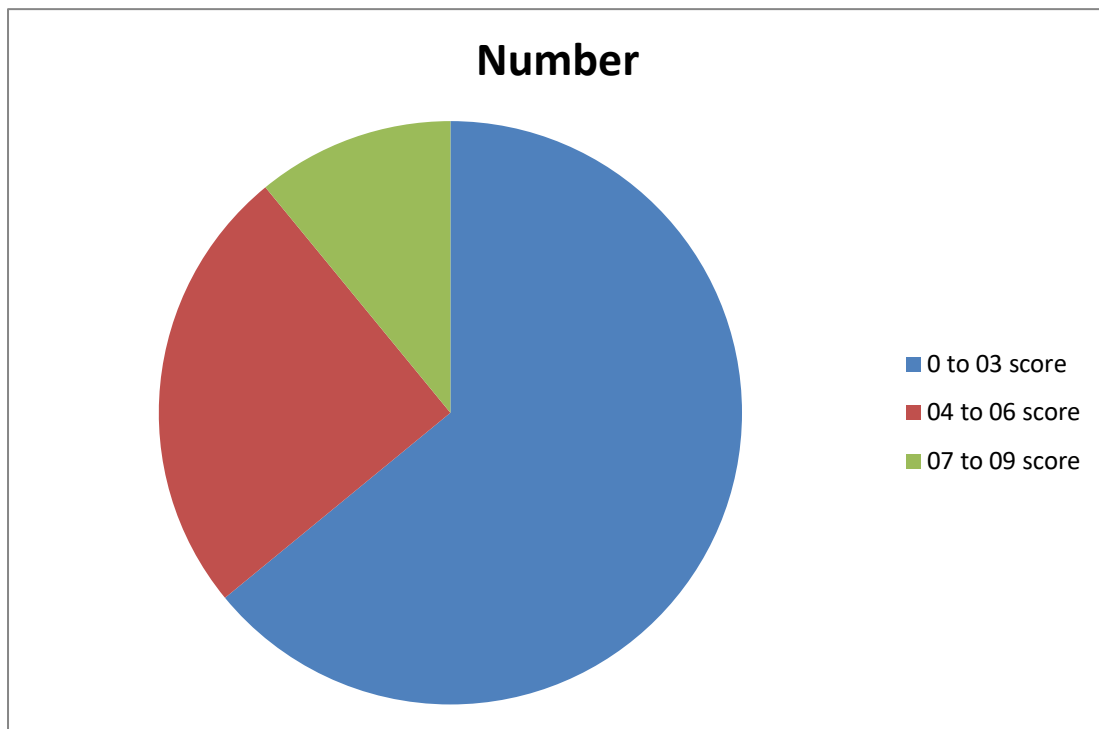
**Table 3: Clinical findings in the subjects (n-75)**

Symptoms	Number	Percentage	P value
<b>Duration</b>			
01 to 03 years	06	08.00	0.001
04 to 06 years	11	14.66	
More than 06 years	58	77.33	
Swelling in the Groin	68	96.66	0.001
Discomfort	21	28	0.001
Pain	67	89.33	0.001
<b>Side</b>			
Left	48	64	0.001
Right	27	36	
<b>Direct Inguinal Hernia</b>	33	44	0.001
<b>Indirect Inguinal hernia</b>	42	56	
<b>Bilateral</b>	00	00	
<b>Complications</b>			
Obstruction	10	13.33	0.001
Gangrene	04	05.33	
Irreducibility	07	09.33	



**Figure 3: Clinical findings in the subjects (n-75)**

VAS score of pain in the 75 patients was assessed in a scale of 0 to 10 and found that 0 to 03 was noted in 18 (24%) patients, 04 to 06 points was noted in 31 (41.33%) patients and 06 to 09 was noted in the remaining 27 (36%) patients. (Table 4) T test calculator for single sample was used to find the statistical significance of VAS score to assess the pain in the study, and found that variables were found to be not significant as the p value was <0.05.



**Figure 4: The pain assessment with the VAS score in the subjects**

Herniorrhaphy was used as a surgical method to treat inguinal Hernia in 34 (45.33%) patients, in Herniorrhaphy with Mesh was used in 12 (16%) patients; Laparoscopic surgery was used in 12 (16%) patients and MIS Laparoscopic surgery in 16 (21.33%) patients. Good healing was noted in 71 (94.66%) patients, recurrence was noted in 02

(02.66%) and wound dehiscence was noted in 03 (04%) patients.

T test calculator for single sample was used to find the statistical significance of final outcome variables in the study, and found that variables were found to be not significant as the p value was <0.05. (Table 5)

**Table 5: Post-operative results in the study (n-75)**

Observation	Number	Percentage	P value
<b>Type of Surgery</b>			
Herniorrhaphy	34	45.33	0.001
Herniorrhaphy with Mesh	13	17.33	
Laparoscopic surgery	12	16	
MIS Laparoscopic surgery	16	21.33	
<b>Final out come</b>			
Good healing	71	94.66	0.001
Recurrence	02	02.66	
Wound dehiscence	03	04	

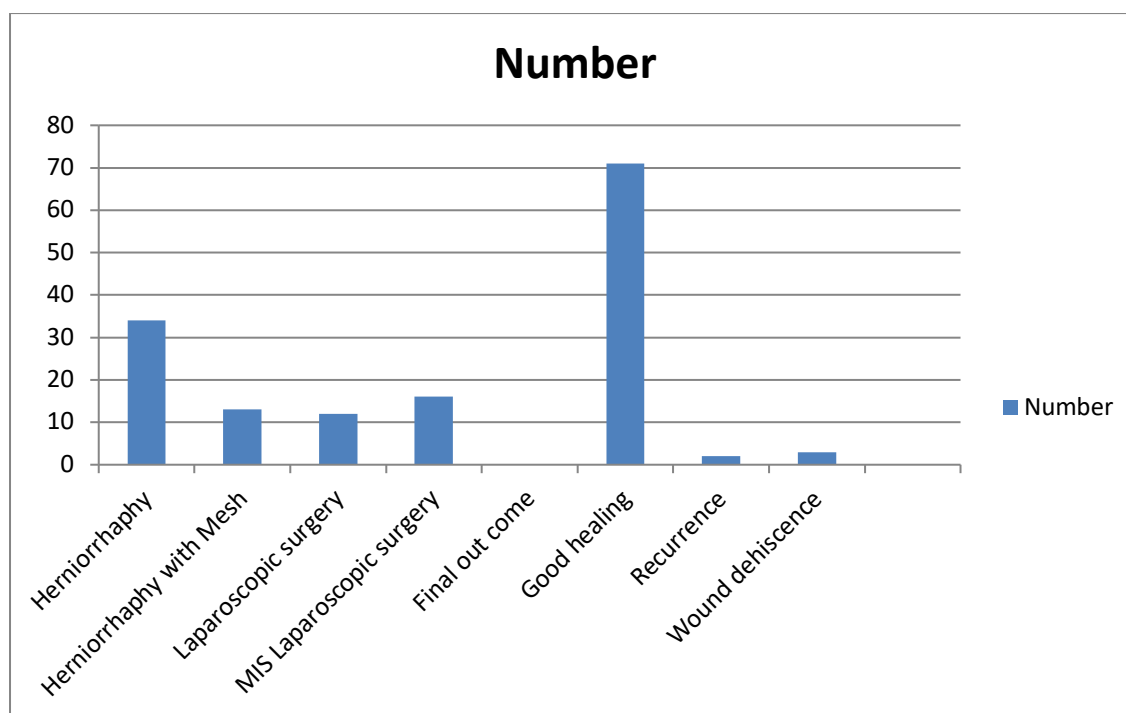


Figure 5: Post-operative results in the study (n-75)

### Discussion

The present study was a prospective, analytical one undertaken at a tertiary care centre in Andhra Pradesh. 75 patients aged between 50 and 80 years were considered for analysis after following the criteria set forth.

Their demographic and clinical details were recorded in a proforma and analysed. The mean age was  $54 \pm 05$  years. 27 (36%) patients were aged between 50 and 60 years, 25 (33.33%) patients were aged between 50 and 60 years, and 23 (30.66%) patients were aged between 50 and 60 years. 61 (81.33%) were males and 14 (18.66%) were females. The male to female ratio was 4.35:1. (Table 1) In a study by de Goede B [23], the mean age was 50.

Similarly in the studies by Ruhl CE [13] and Sayanna and Basu [24,25], the mean ages were 49 years and 51 years respectively. In the present study the males were 71 (94.66%) and 04 were females (05.33%) with a male to female ratio of 17.75:1.

In a study by Agarwal PK (26) 97.27% were males, and 02.72% were females with a Male: Female ratio of 32:1. Higher incidence of inguinal Hernias was also noted in other studies by Burcharth J, [27] with 90.2% males and 09.8% females. Ruhl et al. [28] noted similar observations. Lau H et al. [29] published that males suffer from Hernias more frequently than females.

The basic concept in this predominance of Hernias in the male gender was due to situations of frequent

increase in the intra-abdominal pressures in the males. In this study Bronchial Asthma was observed in 14 (18.66%) patients, Constipation in 21 (28%) patients, Low BMI in 08 (10.66%) patients, Family history of hernias in 05 (06.66%) patients and weight lifting jobs in 04 (05.33%) patients. (Table 2)

It could also be due to frequent altered bowel habits in 28% patients. Sharma (30) concluded from his study that 52.4% of his patients had hernias due to lifting heavy objects. Lee SD, Son T, Lee JB et al [31] also gave a similar observation that one of risk the factors was weight lifting. 42 (56%) patients were from urban areas and 33 (44%) from the rural areas. 31 (41.33%) patients belonged to low socio-economic group, 29 (38.66%) belonged to middle income group and 15 (20%) were from high income group. The BMI was between 18 and 25 in 38 (50.66%) patients and above 25 in 37 (49.33%) patients.

Diabetes Mellitus was present in 51 (68%) patients and not present in 24 (32%) patients. Thyroid function tests were normal in 50 (66%) patients, Hypo function in (25.33%) and hyper function in 06 (08%) patients. Direct inguinal Hernia was noted in 33 (44%) patients and indirect inguinal Hernia was noted in 42 (56%) patients. (Table 3) Agarwal [26] noted from his study that [26] the most common Hernia in his study was indirect in 60% of patients; direct hernia in 30%, and 10% of patients had both.

In this study there were no bilateral hernias. Agarwal [26] noted in his study on the right side

Hernias were common (63%) and 33% on the left side; bilateral in 04% patients. Nordback [32] from his study of 469 patients noted that right-sided were 207, the left-sided 146 were left-sided, and 116 were bilateral. Whereas Gulzar et al., [33] studied 100 patients and found that 64% patients had right-sided inguinal hernia. Garba ES [34] from their survey in Nigeria found that right inguinal hernias were more common than left, with a ratio of 1.7:1. Agarwal [26] noted that the most common symptom was swelling 100/110 (90.90%) patients. This observation concurs with the present study and a study by Jenkins JT. [35] Agarwal reported swelling with pain in 33% patients with mild in 51% and moderate in 49% patients.

In the present study VAS score of pain in the 75 patients was assessed in a scale of 0 to 10 and found that 0 to 03 was noted in 18 (24%) patients, 04 to 06 points was noted in 31 (41.33%) patients and 06 to 09 was noted in the remaining 27 (36%) patients. (Table 4)

Similar findings were made out by Page B et al. [36] Herniorrhaphy was used as a surgical method to treat inguinal Hernia in 34 (45.33%) patients, in Herniorrhaphy with Mesh was used in 12 (16%) patients; Laparoscopic surgery was used in 12 (16%) patients and MIS Laparoscopic surgery in 16 (21.33%) patients. Good healing was noted in 71 (94.66%) patients, recurrence was noted in 02 (02.66%) and wound dehiscence was noted in 03 (04%) patients.

T test calculator for single sample was used to find the statistical significance of final outcome variables in the study, and found that variables were found to be not significant as the p value was <0.05. (Table 5)

The following three authors from their study reported similar results. (Deysine M. [37] Nagraj S, [38] Sinha S Asano H, Yajima S, [39] and Peach G, Tan LC), [40] Limitations of the present study were small sample size, insufficient data to reflect a true picture of Hernias. A multicentric study with large sample size correlated to Aetiological or risk factors are better conclusive.

### Conclusions

In the General surgery practice Hernias are most common among the elderly populations. Heavy manual labourers and weight lifters are commonly affected. Swelling, altered bowel habits, pain and irreducibility are common presenting modes. Associated family histories, Bronchial Asthma are common risk factors. Indirect types of hernias are more common.

Herniorrhaphy with or without reinforcement and/or mesh are commonly performed surgeries. Minimally invasive Laparoscopy is economical, and patients have shorter stay in the hospital.

Inguinal hernias are a major Health problem in the elderly patients.

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