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AN ASSESSMENT OF KNOWLEDGE, ATTITUDES, PERCEPTIONS OF PATIENTS REGARDING HERNIA AND PREFERENCE OF SURGEONS ON USE OF MESH IN HERNIA REPAIR

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ABSTRACT

Objective: To assess knowledge, attitudes and perceptions of patients regarding hernia and preference of surgeons regarding use of mesh in hernia repair. **Method:** This prospective observational cross-sectional study was conducted in Department of General Surgery. Questionnaires were given to 10 surgeons performing hernia repair to determine their preference of use of mesh in hernia repair. Selected patients were interviewed pre and post counseling by means of questionnaires about hernia, need of surgery and use of mesh. Patients were then divided into two groups-PROLENE and VYPRO, on basis of mesh used in their hernia repair. Post-operative follow up included assessment of pain scores using Verbal Numerical Rating Scale, QOL scores using Carolinas Comfort Scale, determination of length of hospital stay, use of analgesics and quality of life between two groups PROLENE MESH and VYPRO II MESH group respectively. **Results:** Cases of Hernia, especially Inguinal Hernia are predominantly seen in males (80%) when compared to females (20%). Patients above age group of 40years (62%) were found to be more susceptible to hernia. Heavy weight lifting, chronic cough, chronic constipation and previous surgeries were found to be main factors that aggravate hernia. An assessment of surgeons' preference in method of hernia repair and type of mesh revealed that most of the surgeons preferred open hernia repair and Polypropylene mesh

(PROLENE). **Conclusion:** There is an extremely statistically significant difference between pre and post-counseling results. No statistical difference in the overall short term outcome of both the groups indicates that the surgeons' preference of PROLENE mesh (with lesser cost) is justified.

KEYWORDS: Hernia, KAP survey, Heavyweight Polypropylene mesh, Composite mesh, Patient counseling, Preferences of Surgeons.

INTRODUCTION

Hernia is the protrusion of an organ through the walls within which it is contained. It may be congenital or acquired later in life because of multiple factors. Hernia was founded in 1997 with the purpose of promoting clinical studies and basic research as they apply to groin hernias, internal hernias, the abdominal wall (anterior and postero-lateral aspects), the diaphragm and the perineum. "Hernia" is the official organ of the European Hernia Society (GREPA), established in 1979, of the American Hernia Society (AHS) established in 1997 and of the Asia Pacific Hernia Society (APHS) established in 2004.[1] Galen developed the concept of hernia formation by "rupture" in the 2nd century. Before the first human dissections, he postulated that a hernia was formed by rupture of the peritoneum and stretching of the fascia and muscles. Today various surgical techniques have been developed through years of trial and failure. Techniques are still changing today. No single repair has been shown to be superior in all cases. Surgeons today still battle the imperfections of hernia repair that frustrated their forefathers. Many surgeons prefer the time tested sutured repair, while new laparoscopic techniques have be proven effective in the proper hands. Today the open tension-free prosthetic mesh repair is popular among surgeons.[2]

The most common types of Hernia includes: In an inguinal hernia, the intestine or the bladder protrudes through the abdominal wall or into the inguinal canal in the groin. About 96% of all groin hernias are inguinal, and most occur in men because of a natural weakness in this area. In an incisional hernia, the intestine pushes through the abdominal wall at the site of previous abdominal surgery. This type is most common in elderly or overweight people who are inactive after abdominal surgery. A femoral hernia occurs when the intestine enters the femoral canal in the upper thigh. Femoral hernias are most common in women, especially those who are pregnant or obese. In an umbilical hernia, part of the small intestine passes through the abdominal wall near the navel. Common in newborns, it also commonly afflicts obese women or those who have had many children. A hiatal hernia happens when the upper

stomach squeezes through the hiatus, an opening in the diaphragm through which the esophagus passes. A Epigastric hernia is a hernia through the linea alba above the umbilicus.[3]

Hernia is a most common surgical condition world widely. Hernias were once the leading cause of acute intestinal obstruction. Public awareness and general policy of early repair has markedly reduced the frequency of incarceration of intestine in these musculofascial defects. The common sites for these defects, in order of frequency, are inguinal, umbilical, incisional and femoral.[2] Techniques of repair continue to evolve but tension-free, mesh repairs are the current standard. In spite of significant improvements in surgery. It still carries mortality and morbidity due to delay between diagnosis and surgical intervention. A delay in the treatment of hernia may lead to incarceration and strangulation.[4]

About 27% of males and 3% of females develop a groin hernia at some time in their life. [5] In 2013 about 25 million people had a hernia.[6] Inguinal, femoral and abdominal hernias resulted in 32,500 deaths globally in 2013 and 50,500 in 1990.[4] In developing countries like us the risk of incarceration and complications is much higher due to delay in seeking treatment due to lack of awareness among patients. So this study would help to assess the knowledge, awareness and perceptions of patients regarding hernia. This observational study would provide the platform upon which need for diseases like hernia would be taken seriously at all levels of the health system. An assessment of the knowledge, awareness and practices of surgeons with a view to bring forward the preferences of surgeons regarding use of mesh in hernia repair. This study would bring to the fore, the predisposing factors of hernia and case load of hernia in Suraram area. Improving the results of hernia treatment will have major medical and economic consequences. For the patient, a successful hernia repair means a lower risk of complications, a quick postoperative recovery and a minimal risk of persistent pain symptoms or recurrent hernias. Lastly, this study would help to remove some of the misconceptions and fears people have about need of surgery and use of mesh in hernia and would also bring to light the need to offer health education on hernia.

MATERIALS AND METHODS

Study was conducted at Department of General Surgery, Malla Reddy Hospital, located at Suraram X roads, Jeedimetla. The reason for selecting this department was a high influx of patients suffering from Hernia, who were scheduled for hernia repair and the availability of surgeons performing mesh repair which in turn had a broad scope for analysis of our study.

The study was a prospective observational cross-sectional study by including male or female patients greater than 18years of age, patients who were mentally stable and able to respond to queries, who agreed for a follow up and provided contact information and all surgeons performing various types of hernia repair and willing to answer the questionnaires excluding pregnant women, patients with obstructed hernia and not requiring use of mesh.

Questionnaires were given to 10 surgeons performing hernia repair to determine their preference of use of mesh in hernia repair. Selected patients interviewed by means of questionnaires and their answers duly recorded before the surgery. Patients were then given counseling on hernia and the need of surgery and the use of mesh. The questionnaires comprised of two parts. Part I includes bio-data and socio-demographics of the individual. Part II includes questions determining the knowledge, awareness, perceptions and practices towards hernia and its management. Post-operatively, a second KAP survey was conducted to reassess patients' knowledge, attitudes and perceptions after counseling. Post-operative follow up included assessment of pain scores using Verbal Numerical Rating Scale, assessment of QOL scores using Carolinas Comfort Scale, determination of length of hospital stay, use of analgesics and quality of life between two groups PROLENE MESH and VYPROII MESH group respectively.

Tools used in the study

a) Proforma (data entry form)

A separate data entry form was designed for incorporating patient details. The format contains the details such as patients demographic details,(Name, Age, Gender, IP number, DOA, DOD, Reason for admission, Patient's past medical and medication history), type of hernia repair done, type of mesh used and treatment chart.

b) KAP survey questionnaire for patients

Selected patients were interviewed by means of questionnaires and their answers were duly recorded before the surgery. Patients were given counseling on hernia and the need of surgery and the use of mesh The questionnaires comprised of two parts.

- Part I will include bio-data and socio-demographics of the individual.
- Part II will include questions determining the knowledge, attitudes, perceptions and practices towards hernia and its management

c) KAP survey questionnaire for surgeons

Part I included details of the surgeon (name, qualification, department, years of experience etc.)

Part II included questions regarding the experience of surgeons with hernia repair, their preference of mesh and number and types of complications seen, if any.

d) Assessment of Pain scores using Verbal Numerical Rating Scale

Pain scores were assessed using VNRS scores at 24hrs, 14days, 1week, 1month and 3 months for groups PROLENE and VYPRO II respectively. Scores were rated on a basis from 0-10, where 0 is no pain and 10 is worst pain possible.

e) Assessment of Quality of Life using Carolinas Comfort scale

This consisted of a list of 8 questions in order to assess pain, sensation of mesh and movement limitations in the patients in whom PROLENE and VYPRO II meshes were used respectively.

RESULTS

In this prospective, cross-sectional, observational study out of 64 cases of Hernia, 50 patients were selected based on inclusion and exclusion criteria. The study was conducted over a period of six months at the Malla Reddy Hospital, Suraram, taking into account the data of 50 patients that agreed to a KAP Survey and 10 Surgeons who were performing various types of hernia repair.

Patients with hernia were predominantly male**.** Majority of the patients belonged to the age group of 40yrs and above indicating age is a factor for aggravating hernia. Majority of the patients did not receive any formal education. This decision was based on the distribution of patients according to their socio-demographic characteristics (Table 1).

The employed patients were more susceptible to hernia and these patients were mainly laborers thus engaging in heavy weight lifting and hard labor (Figure 1a, 1b). The data confirms (Figure 2) that heavy weight lifting is the major trigger factor for hernia followed by chronic cough (mostly from smoking), chronic constipation, previous surgeries (like appendectomy and hysterectomy) and urinary obstruction. The cases are predominantly inguinal hernia followed by Incisional, Umbilical, Epigastric and Lumbar hernia. Inguinal

hernia has been reported in majority of the male patients whereas female patients showed more cases of Incisional hernia (Figure 3).

ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PERCEPTIONS OF PATIENTS

Patient counseling has helped patients to increase their knowledge about hernia and its causes and to reduce their fear that hernia is a serious condition (Table 2). Based on the data (Table 3), we can conclude that patient counseling has positively helped patients to clear the misconception of the swelling/lump in their body. Improve their awareness that only surgery is the treatment for hernia. Another point of observation here is that patients report to the doctor, only after their symptoms become bothersome. Patient education on hernia can help patients to contact the doctor before symptoms get aggravated. Based on the data (Figure 4), we can conclude that patient counseling has positively helped patients to understand the need of surgery and what actually happens during surgery, the need and use of mesh during surgery, decrease their fear about complications during and after surgery, change patients' perceptions towards hernia repair, decrease fear of recurrence and inability to lead a normal life.

By an assessment of the practices of surgeons regarding hernia repair and the use of mesh, majority of the surgeons considered all age groups from 18 to 60yrs as safe candidates for repair with mesh reinforcement. Surgeons were of the opinion that any hernia size defect above 3cm warranties the use of mesh. Majority of the surgeons (70%) chose PROLENE as their preferred and most routinely used mesh material and chose Onlay as the routinely preferred mesh placement technique, seroma as the most common complication seen in mesh repairs, followed by erosion of mesh and failed repairs. (Figure 5 – Figure 9).

ASSESSMENT OF PAIN SCORES and ASSESSMENT OF QUALITY OF LIFE SCORES

There is no statistically significant difference in the Mean pain scores of both the meshes at 24hrs, 1 week and 14days respectively. Significant difference was observed only at 3 months follow up, suggesting pain scores in patients of VYPRO II mesh group decreased in the 3rd month when compared to PROLENE group (Table 4). In spite of there being a difference in the activity score, there is no statistically significant difference between the QOL scores of PROLENE and VYPRO II meshes (Table 5). There is a statistically significant difference in the duration of length of hospital stay, analgesic use and return to normal activities between

the users of PROLENE and VYPRO II mesh respectively at $p<0.05$ (Table 6). On application of chi-square test, the difference in rate of complications between PROLENE and VYPRO II meshes there was no statistical significant difference at $p<0.05$ (Figure 10).

Table 1: Distribution of patients according to their socio-demographic characteristics

CATEGORY	MALE n(%)	FEMALE n(%)	TOTAL
SEX	40 (80%)	10 (20%)	50
AGE			
20-40 years	15 (30%)	4 (8%)	19
>40 years	25 (50%)	6 (12%)	31
EDUCATION LEVEL			
No formal education	33 (66%)	9 (18%)	42
Primary	2 (4%)	1(2%)	3
10^{th} standard	4 (8%)	0	4
Higher education	1(2%)	0	1

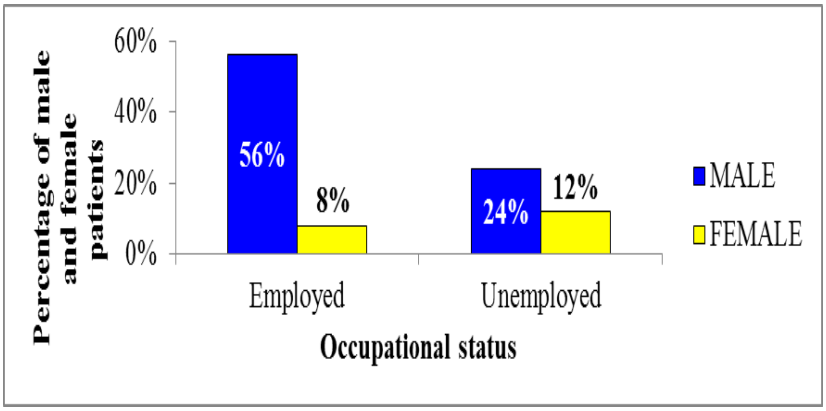

Figure 1(a): Distribution of male and female patients according to their occupational status.

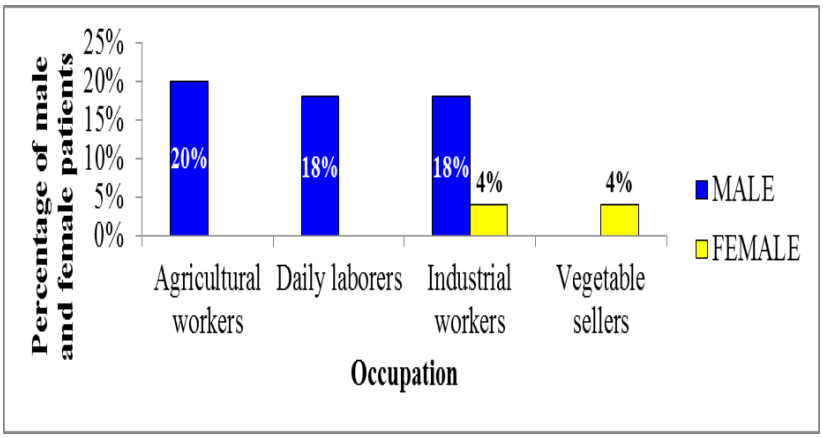

Figure 1(b): Distribution of male and female patients based on their type of occupation

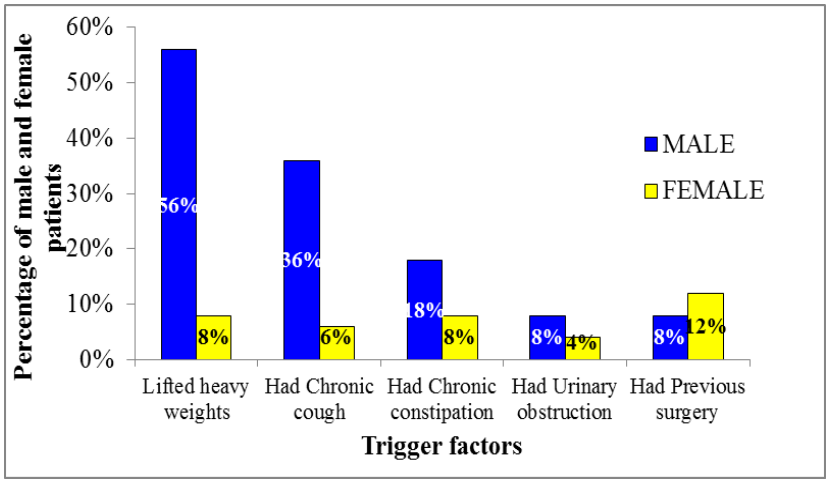

Figure 2: Distribution of male and female patients indicating the presence of trigger factors leading to Hernia.

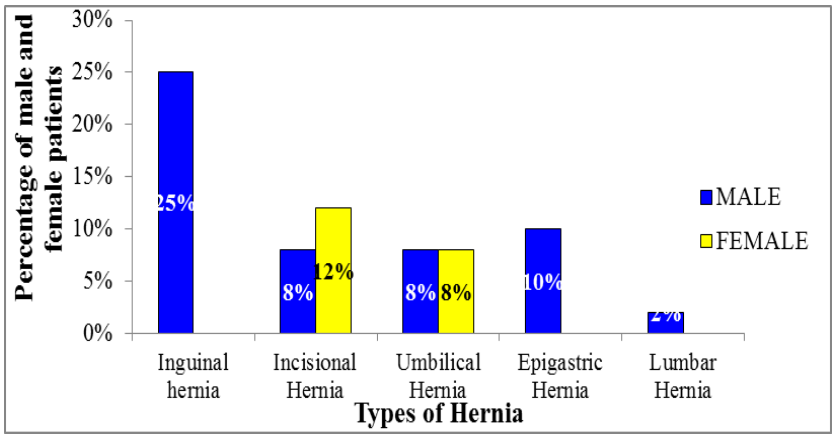

Figure 3: Distribution of male and female patients according to various types of hernia, indicating case-load of hernia

Table 2: Knowledge of patients on Hernia and its causes, before and after patient education

STATEMENT	PRE-COUNSELING (n=50)%	POST-COUNSELING (n=50)%	*p*-VALUE
Knowledge of hernia	16(32%)	47 (94%)	<0.0001
Hernia is a serious disease	20(40%)	0	<0.0001
Causes of hernia			
Spicy diet	11(22%)	0	<0.0001
Alcohol consumption	35(70%)	3(6%)	0.0023
Smoking	0	50(100%)	<0.0001
Heavy weight lifting	33(66%)	46(92%)	<0.0014
Persistent cough	20(40%)	45(90%)	<0.0001
Urinary obstruction	6(12%)	45(90%)	<0.0001
Previous surgery	10(20%)	44(88%)	<0.0001
Chronic constipation	9(18%)	45(90%)	<0.0001

Table 3: Attitudes of patients' towards diagnosis of hernia and its treatment before and after counseling

STATEMENT	PRE-COUNSELING (n=50)	POST-COUNSELING (n=50)	*p*-VALUE
Thought the lump was cancerous	43(86%)	0	<0.0001
Immediately consulted the doctor	3(6%)	N/A	N/A
Ashamed of the lump	45(90%)	N/A	N/A
Thought home remedies can cure the lump	22(44%)	0	<0.0001
Thought persons, other than doctor can cure the lump	0	0	N/A
Thought medicines is the best option to treat the lump	22(44%)	0	<0.0001
Thought surgery is the best option to treat the lump	24(48%)	48(96%)	<0.0001

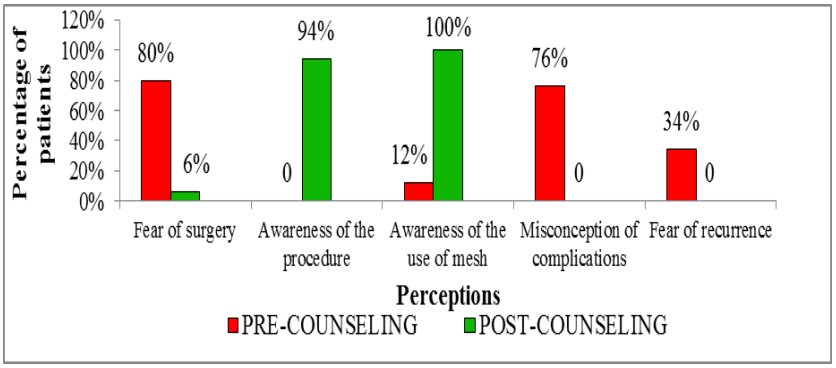

Figure 4: Perceptions of patients towards surgery and the use of mesh, before and after patient counseling.

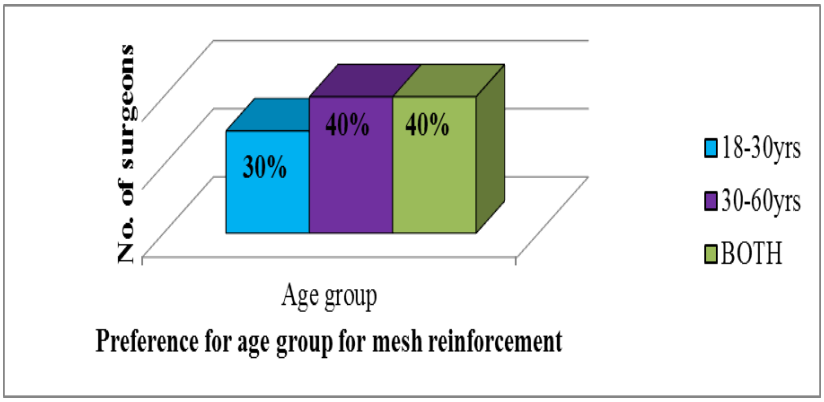

Figure 5: Distribution of surgeons showing preference for age groups of patients undergoing mesh repair

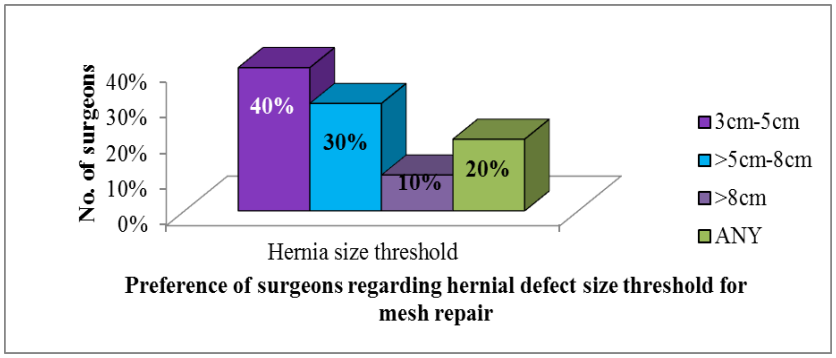

Figure 6: Distribution of surgeons showing preference regarding hernia defect size threshold for hernia repair

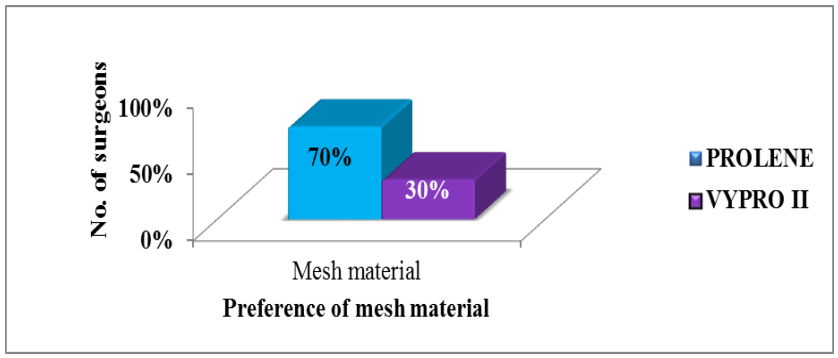

Figure 7: Distribution of surgeons showing preference for mesh material.

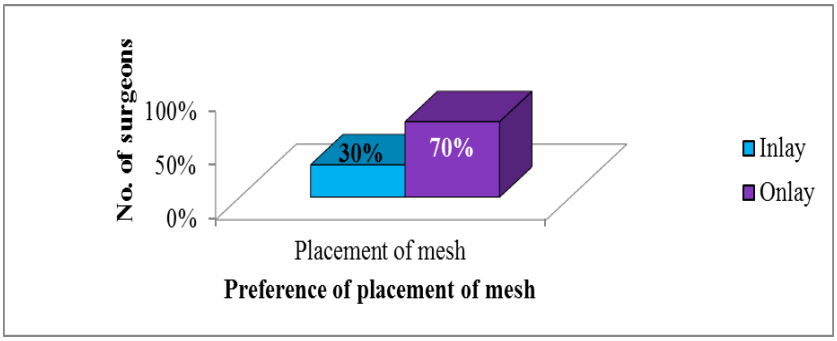

Figure 8: Distribution of surgeons showing preference for placement of mesh.

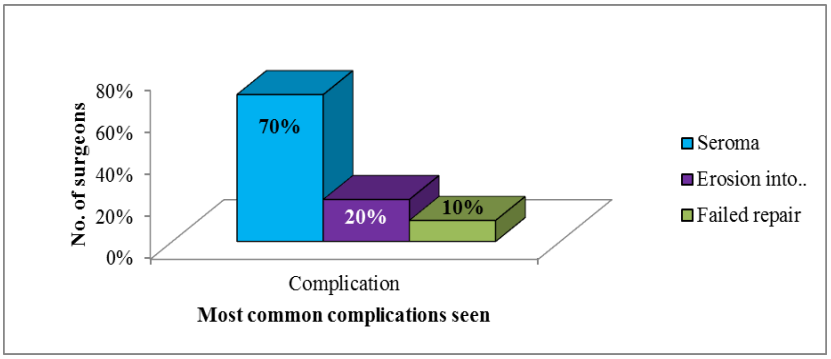

Figure 9: Distribution of surgeons' opinions according to the most common complication seen in hernia repair, in their experience.

Table 5: Comparison of Median VNRS pain scores between PROLENE and VYPRO II groups

DURATION	PROLENE (n=25)	VYPRO II (n=25)	*U*-VALUE	*p*-VALUE
24 hrs	8	8	0.5246	280
1 week	8	8	0.4444	273.5
14 days	7	7	0.6663	290.5
1 month	4	3	0.2271	251.5
3 month	3	2	0.0431	215

Table 6: Comparison of Median CCS scores between PROLENE and VYPRO II mesh groups

PRIMARY ENDPOINTS	PROLENE MESH (n=25)	VYPRO II MESH (n=25)	*U*-VALUE	*p*-VALUE
Activity score	2	1	169.5	0.0261
Sensation score	2	1	14.5	0.0853
Pain score	2.5	1	19	0.2261
Movement score	1.5	1	14	0.6212

Table 7: Comparison of LOH, analgesic use and return to normal activities between PROLENE and VYPRO II mesh users

S.NO	VARIABLE (days)	PROLENE MESH (n=25)	VYPRO II MESH (n=25)	*p*-VALUE
1	Length of hospital stay (days)	12	8	<0.0001
2	Analgesic use (days)	9	4	<0.0001
3	Return to normal activities (days)	20	18	0.0011

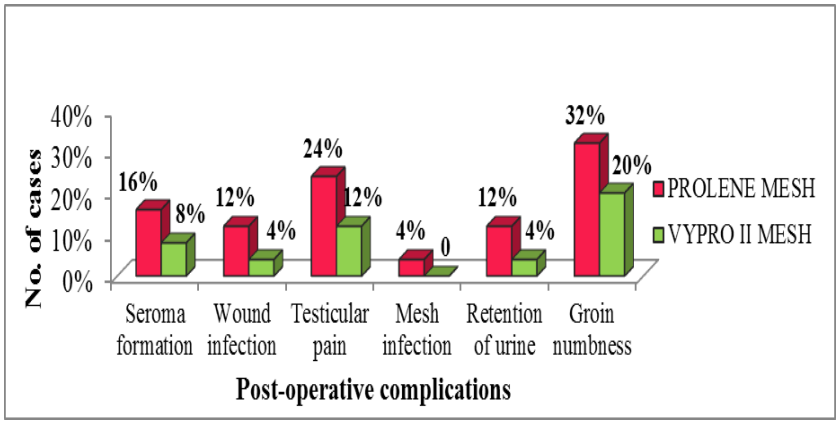

Figure 10: Comparison of percentage of patients with post-operative complications between PROLENE and VYPRO II groups.

DISCUSSION

The study conducted by Shengulwar Sayanna, on Prevalence of Inguinal hernia in Indian population, a retrospective study[4,7] showed that the age distribution of inguinal hernia was peaking at adult age with male preponderance of 7.25: 1 male to female ratio. The major dominance of Primary Inguinal hernia with right side was seen. The study elicited that heavy object lifting and chronic constipation were major risk factors for inguinal hernia. It is concluded that these results may be a useful guide for future studies about the prevalence of inguinal hernias in the populations as a whole.

The age distribution of inguinal hernia repair was peaking at adult age with male preponderance of 14: 1 male to female ratio. The study elicited that heavy object lifting and chronic constipation were major risk factors for inguinal hernia in males which is in accordance to the study conducted by Bharani Raj Kumar et al.[9]

In this study, it was found that majority of the patients had lack of knowledge about hernia and its causes. They also had several misconceptions, fears about surgery and the use of mesh. Patient counseling has helped patients to increase their knowledge about hernia and its causes and to reduce their fear that hernia is a serious condition. Patient counseling has positively helped patients to clear the misconception of the swelling/lump in their body, improve their awareness that only surgery is the treatment for hernia. Another point of observation here is that patients report to the doctor only after their symptoms become bothersome. Patient education on hernia can help patients to contact the doctor before symptoms get aggravated. That patient counseling has positively helped patients to understand the need of surgery and what actually happens during surgery, understand the need and use of mesh during surgery decrease their fear about complications during and after surgery, change patients' perceptions towards hernia repair, decrease fear of recurrence and inability to lead a normal life. This is in support to the study conducted by Tia Robert Sule in the East Mamprusi district.[10]

In this study, it was found that majority of the surgeons considered all age groups from 18 to 60yrs as safe candidates for repair with mesh reinforcement. Surgeons were of the opinion that any hernia size defect above 3cm warranties the use of mesh. All the surgeons reported to have considered the use of mesh as the best option for hernia repair, their reasons being, Mesh gives better strength to post-wall of the canal. It provides for a tension-free repair and

recurrence rate is very low when compared to herniorrhaphy. Majority of the surgeons (70%) chose PROLENE as their preferred and most routinely used mesh material.

The study conducted by H Kulacoglu, on Current options in inguinal hernia repair in adult patients[11] concludes that inguinal hernia is a very common problem. Surgical repair is the current approach, whereas asymptomatic or minimally symptomatic hernias may be good candidate for watchful waiting. Prophylactic antibiotics can be used in centers with high rate of wound infection. Local anesthesia is a suitable and economic option for open repairs, and should be popularized in day-case setting. Numerous repair methods have been described to date. Mesh repairs are superior to "non-mesh" tissue-suture repairs. Lichtenstein repair and endoscopic/laparoscopic techniques have similar efficacy. Standard polypropylene mesh is still the choice, whereas use of partially absorbable lightweight meshes seems to have some advantages. In this study, patients were divided on basis of type of mesh used in their hernia repair as PROLENE (n=25) and VYPRO II (n=25). Assessment of their pain scores using Verbal Numerical Rating Scale (VNRS) was done at specified intervals and mean of scores were compared using unpaired t-test. The results indicated no significant difference between pain scores of both the meshes at 24hrs, 1 week and 14days. Patients of PROLENE group reported more pain at 1month and 3months when compared to VYPRO II group.

The study conducted by Adil Bangash, Nadim Khan, Muzaffaruddin Sadiq on Composite polypropylene mesh versus lightweight polypropylene mesh: The TAPP repair for laparoscopic inguinal hernia repair [12] concludes that no difference in the frequency of recurrence was observed over a one-year follow-up but significant pain scores were observed in the polypropylene group. Studies with longer follow-up to rule the rate of recurrence in composite meshes will determine its benefit over the lightweight polypropylene meshes.

In this study QOL of patients in PROLENE and VYPRO II groups were assessed using Carolinas Comfort Scores after 3months of surgery and the median scores of Primary Endpoints were compared using Mann-Whitney U-test. There was no statistically significant difference found between the patients of the two groups. In this study, it was found that the length of hospital stay, duration of analgesic use and the time taken to return to normal activities was statistically different between both the groups. That is PROLENE group exhibited more duration in LOH, analgesic use and in return to normal activities.[12,13]

The study conducted by Andras Zaborszky, Rita Gyanti, John A Barry, Brian K Saxby, Panchanan Bhattacharya, Fazal A Hasan on Measurement issues when assessing quality of life outcomes for different types of hernia mesh repair[14] concludes that in this study of quality of life outcomes related to different mesh types, the CCS subscales were more sensitive to differences in outcome than the total CCS score for the whole questionnaire. Future research should consider using the CCS subscales rather than the CCS total score. This study assessed QoL outcomes in two hernia patient groups and found that the type of mesh used in their surgical repair made only a minor difference to their QOL outcomes.

The study conducted by Kaundinya Kiran Bharatam on Prospective analysis of postoperative outcomes – immediate / delayed in patients undergoing Lichtenstein's open inguinal hernioplasty using Vypro® vs Prolene® mesh[15] concludes that in their study comparison of outcomes in the immediate and late postoperative phase of 50 patients [25 - prolene® and 25 - vypro®] who underwent Lichtenstein's inguinal hernia. The results did encourage the lightweight mesh like vypro® in the immediate post-operative phase but did not give any major difference between the meshes in the long term complications or outcomes of hernia repair. The observations were similar to other studies done comparing the various mesh used for hernia repair.

CONCLUSION

A comparison of assessment of patients' knowledge, attitudes and perceptions towards hernia and hernia repair, before and after counseling, revealed that patient counseling makes a significant difference in improving patients' beliefs thus confirming the fact that patient education on hernia must be taken seriously at all levels of health care system**.** An assessment of surgeons' preference in method of hernia repair and the type of mesh revealed that most of the surgeons preferred open hernia repair and Polypropylene mesh (PROLENE). A comparison of two groups using Prolene and Vypro II meshes respectively showed no statistically significant difference between the two meshes in terms of pain scores and quality of life scores. So, the surgeon's preference of PROLENE mesh (with lesser cost) is justified.

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Conflicts of Interest

No conflicts of interest have been declared.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical Standards of the Institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or Comparable ethical standards.

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