



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJAMSCR | Volume 8 | Issue 4 | Oct - Dec - 2020
www.ijamscr.com

ISSN: 2347-6567

Research article

Medical research

Study of Demographic, Risk factors and Evidence based Hernia repair and its Management in Adults in Tertiary care Hospital

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ABSTRACT

Background

Hernia is defined as a protrusion of an organ or part (such as the intestine) through connective tissue or through wall of the cavity (as the abdomen) in which it is normally enclosed and cause pain and discomfort. Surgery is the only method to cure this Hernia. The type of Hernia is based on the anatomical position of the body like Inguinal Hernia, Femoral Hernia, Hiatal Hernia, Incisional Hernia, Umbilical Hernia and Epi-gastric Hernia. Local anaesthetic drug is prescribed to the patient before going to surgery and then anti-biotic drugs for post-operative. The aim of the study is to evaluate demographic information including distribution of hernia patients in different hospital wards, gender and age, occupation, type of hernia, prescription drugs and risk factors associated with adults hernia patients at a Tertiary Care Hospital, Andhra Pradesh Vaidya Vidhana Parishad (APVVP) Government District Hospital, Proddatur, YSR Kadapa District, Andhra Pradesh, India.

Methods

This is a prospective study, which was carried out in the department of surgery for a period of 6 months. The most common Laparoscopic technique for inguinal Hernia repair is Transdermal Peritoneal (TAPP) repair and Totally Extraperitoneal (TEP) repair. All cases were operated and procedure adopted was anatomical repair or mesh repair or laparoscopic method. History and clinical examination were required to confirm the diagnosis of clinical evidence of groin Hernia. Patient demographic information including gender, age, occupation, hernia type prescription drugs and risk factors were collected.

Results

A total number of 110 cases of Hernia were studied with follow up period varying from 6 months. Hernia patients were distributed among three surgical wards, male surgical ward occupied highest patients with 40.9% (45 out of 110) and overall male patient predominance (62 out of 110) was observed among all the surgical wards. Age group distribution analysis revealed 60-70 years patients were found high percentage 24.5 (27 out of 110). While illiterate occupation patients were affected more by hernia compared to literate occupation, Coolly and Farmers were the illiterate outpatients affected more than 50 percent (50.8% 32 out of 63). In the literate occupation group, employees are highly affected (29.8% 14 out of 47). Inguinal hernia was found as most frequent hernia with 42.7% cases (47 out of 110). Antibiotics were the most prescribed drugs to the hernia patients. Weight lifting, pregnancy, and obesity were the main risk factors of Hernia, more than 60% of patients (65% 52 out of 80), were associated with these risk factors.

Conclusion

In this study we found that rural area illiterate occupation population was affected more when compared to urban literate group. This could be due to occupation related risk factor weight lifting.

INTRODUCTION

Hernia occurs most commonly in the abdominal region when the organ of the body protrudes through the tissue or muscle as an abnormal opening. However, this is not the definition of Hernia according to Holistic sciences Ayurveda, a traditional Indian medical practice describes Hernia as a swelling of the intestine [1]. The European Hernia Society (EHS) working group consisting of 14 countries representative expert surgeons provided guidelines and summary of general practitioner during their regular meetings and noted the cultural differences between the members were easily overcome through the educating each other and pointed out several risk factors including smoking, family history of hernia, collagen disease and long-term heavy work [2]. For inguinal hernia type, increased abdominal pressure, weakness of abdominal muscles, obesity, pregnancy and heavy weight lifting have been reported as risk factors. Studies with large scale data on the occurrence have been suggested for the precise understanding of the etiology and pathophysiology of inguinal hernia [3]. More than 90 percent of hernia patients in the primary care were men and the incidence of hernia was high with age, 11 per 10,000 in the age group of 16-24 years which increased to 200 per 10,000 in the age 75 years and above [4]. The specific risk factors for inguinal hernia prevalence and risk factor assessment in semi-urban areas of every geographical region has been suggested which are very helpful for prediction of inguinal hernias [5]. Hernia prevalence and risk factors assessment in Proddatur, a semi-urban region in YSR Kadapa District, Andhra Pradesh, India has not been reported.

There are different types of hernias depending on the location of the body part where it occurs. Common types include Umbilical Hernia and Inguinal Hernias [6]. Less common are Epigastria and Femoral Hernias. Symptoms may range from a painless bulge to considerable pain, swelling and discolouration [6]. Treatment will normally involve surgery to repair the weakened abdominal wall. Serious complications can occur when Hernias become incarcerated or irreducible (that can't be pushed back through the abdominal wall) which can lead to a Strangulated Hernia, where the blood supply to the Hernia is cut off [6]. An Inguinal Hernia can vary from person to person. Some have virtually no symptoms while others have significant symptoms. The most common sign of an Inguinal Hernia is a bulge or lump in groin [7]. The lump may become bigger when coughing, bending or straining. The lump may become smaller, when the pain decreases, when lying down. The skin over the Hernia may be swollen and red [7]. Umbilical Hernia most commonly occurs in infants but may also develop in adults they are characterised by bulging around the belly button [7]. Femoral Hernias tend to

occur in older people. They are also more common in women thought to be related to the wreaking of the abdominal tissues during pregnancies [7]. An Incisional Hernia is a type of Hernia caused by an incompletely healed surgical wound. Since median incisions in the abdomen are frequent for abdominal exploratory surgery [7]. Epi-gastric Hernias appear in a line between the bottom of the breast bone and the belly button and will normally be no larger than a golf ball in size [8].

The mechanical causes include: improper heavy weight lifting, hard coughing bouts, sharp blows to the abdomen, that increase the pressure of the abdominal cavity may also cause Hernia or worsen the existing hernia, some examples would be obesity, straining during a bowel movement of the urination (constipation, enlarged prostate), chronic lung disease, and also fluid in the abdominal cavity.

In this study, we have conducted studies to evaluate whether the gender, age, occupation influence the incidence of hernia and assessed the risk factors associated with the incidence in a tertiary care hospital in Proddatur region which has not been reported earlier.

METHODS

The research was performed as a prospective study; a total number of 110 cases of Hernia were collected over 6 months of time period from May 2019 to November 2019. The objective of the study was to estimate the incidence of Inguinal and Incisional Hernia among different age groups and assessed the risk factors influence these two types of Hernias in a tertiary care Hospital, Andhra Pradesh Vaidya Vidhana Parishad (APVVP) Government Hospital in Proddatur, YSR Kadapa District, Andhra Pradesh, India, which has not been studied earlier in this semi-urban hospital with lot of Hernia patients.

Ethical clearance was obtained from Institutional Ethics committee. Patients were well informed about the study and written informed consent was obtained. Patients of above 18 years and who admitted in Male, Female Surgical and Gynecological department wards were included. Patients were excluded if the treatment charts did not provide the details about the drugs given. Infants and children aged below 4 years were not allowed to participate in the study.

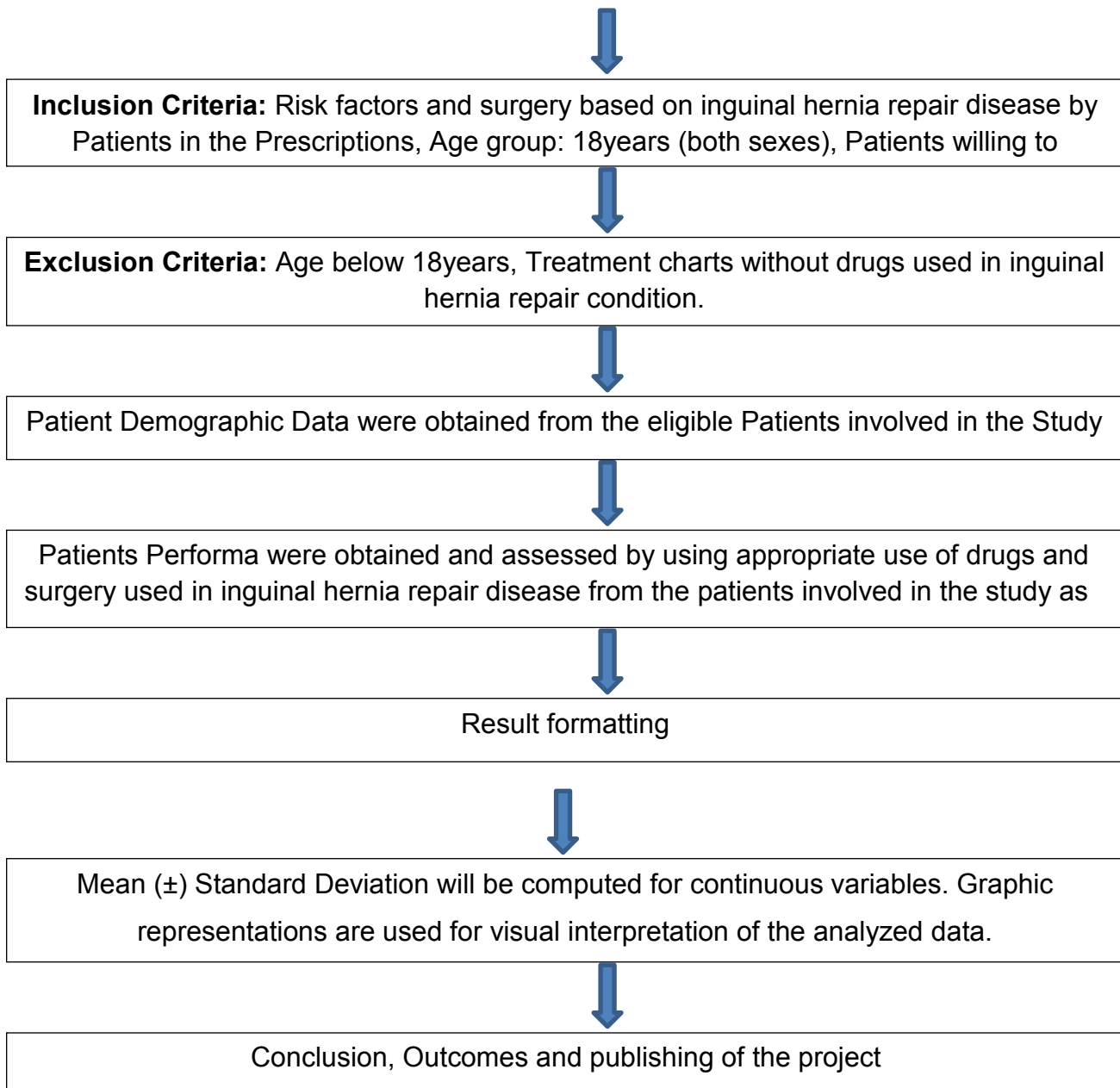
Data from each patient was collected either through interview or from the patient case file and utilized for evaluation of study parameters. The parameters included patient demographic details of age, sex and weight were collected in specified patient data collection form. Additionally, patients' clinical history, Diagnosis, Laboratory investigation, treatment regimen, and discharge medications were recorded daily in- patient data collection form. The schematic representation of methodology is shown below (Schema 1)

Schema 1: Schematic Representation of the methodology for the Current Study:

Protocol & submission to the Institutional Review Board/Ethical Committee for approval



Informed Consent was obtained from the eligible patients involved in the study



RESULTS

Highest cases were reported in Male surgical ward and highest percent of males were affected by Hernia.

In order to determine which ward of the tertiary care Hospital in semi-urban area of Proddatur, we have determined the number of patients reported in each ward of the hospital and found that Male surgical ward received more cases, 45 out of 110 (40.90%), followed by Female surgical ward 35 cases out of 110 (31.81%) and Acute Medical ward 30 cases (17 male +13 female) out of 110 (27.27%) (Figure 1A). Further analysis performed to identify the gender predominance of these cases among all the three wards. We found 62 male cases (45 from Male Surgical ward and 17 males from Acute medical care ward) and 48 female cases (35 from Female surgical ward and 13 women from Acute Medical care ward). These results were presented in Figure 1B indicating the percent cases of males and females in each ward. In the male surgical ward, 45 male cases out of total 62 (72.58%) were reported.

In the Acute medical care ward 17 male cases out of total 62 (27.41%) were reported. In the female surgical ward, 35 female cases out of total 48 (72.91%) were reported. In Acute medical care ward 13 female cases out of 48 (27.08%) were reported.

Age group of 60-70 years was more susceptible to Hernia in Tertiary care hospital.

To evaluate whether age of the patients influence the hernia incidence, we stratified hernia patients based on age. Results of this study presented in **Figure 2** revealed one quarter of patients i.e 24.54% (27 out of 110) fall in the age group of 60-70 years, followed by 40-50 years (23.63%, 26 out of 110), 30-40 years (20.90%, 23 out of 110), 20-30 years (16.36%, 18 out of 110) and 50-60 years (14.54%, 16 out of 110).

Farming and coolly illiterate communities and Employees in the literate occupation group were more affected by Hernia.

To determine whether there is any effect of literacy on the

incidence of hernia, we identified the literacy level of hernia patients in this cohort. We have determined whether the illiterate occupation and literate occupation influences the Hernia incidences in this cohort. In the illiterate category, we found records of 63 cases among the three different surgical wards, highest in the Male surgical ward (50.79%, 32 cases out of 63), followed by Acute medical ward (30.15%, 19 cases out of 63) and lowest in Female surgical ward (19.04%, 12 out of 63) (Figure 3A). There were three illiterate occupation categories recorded, Cooly (daily wage workers), Farmers, and Tailors along with the others (without any specifics of occupation). Our results indicated that among the three illiterate occupations, Coolies (16 cases, color blue among all the three wards) and Farmers (16 cases, color green among all the three wards) were affected more by

Hernia than Tailors (cases 10, color red among all the three wards) (Figure 3B). Male surgical ward reported more hernia cases of Coolies, Farmers and Tailors (n=22 (7+9+6)) indicating the male predominance in the hernia occurrence in this Tertiary hospital (Figure 3A). We evaluated the literate occupation hernia patients' incidence in the cohort of 110 patient in all the three department wards. In the literate occupation group there were 47 hernia patients recorded in all the three departments. In the literate occupation there were three occupation groups; Employees, Students and Teachers. There was other group in the literate occupation group which was not specified any occupation and showed as others. The data presented in Figure 3C showed the highest percent (42.55%, 20 out of 47) of Hernia incidences in the Acute medical ward followed by Male surgical ward 31.91% (15 out of 47) and Female surgical ward 25.53% (12 out of 47). When we analyze the individual literate occupation category hernia incidence, we found Employees are highly affected 29.78% (14 cases out of 47, blue color code among the three wards), followed by students 21.27% (10 cases out of 47, green color code among the three wards) and Teachers 14.89% (7 cases out of 47, red color code among the three wards) (Figure 3D).

Inguinal Hernia type cases were found highest among different types of Hernia.

To determine what type of Hernia occurs in the tertiary care hospital patients, we identified the number of patients and

their types of Hernia. As the results presented in Figure 4, Inguinal Hernia cases were highest 42.72% (47 cases out of 110), followed by Incisional Hernia 34.54% (38 cases out of 110), Umbilical Hernia 15.45% (15 cases out of 110) and others 7.27% (8 cases out of 110).

Among the prescription drugs, antibiotics were found higher compared to Anti-ulcerative and Analgesic drugs.

To identify the type of prescription drugs given to hernia patients, we determine drugs which were frequently prescribed to Hernia patients. The results revealed antibiotics comes first with 27.27% (30 out of 110) followed by anti-ulceratives 24.54% (27 out of 110), analgesic 22.72% (25 out of 110), vitamins 16.36% (18 out of 110), and local anaesthetic 9.09% (10 out of 110) (Figure 5).

Risk Factors assessment revealed Weight lifting as top risk factor for Hernia in this cohort.

In order to determine the risk factors which were associated with Hernia, we have evaluated various risk factors data available on 80 patients and found weight lifting as a top risk factors with 26.25% (21 cases out of 80) followed by pregnancy 21.25% (17 cases out of 80), obesity 17.5% (14 cases out of 80), chronic constipation 15% (12 out of 80), Family history 11.25% (9 out of 80) and chronic cough 8.75% (7 out of 80) (Figure 6).

The main risk factors for occurring of Hernia is Weight lifting(26.2%),it makes the intestine bulges out from the abdomen, other risk factor is pregnancy cases(21.2%) it causes the Incisional Hernia due to incomplete recovery of the scar and the other risk factors are obesity(17.1%), chronic constipation(15%), Family History (11.5%), chronic cough(8.75%). Shown in fig(4a).

Drugs are preferred for postoperative to avoid the infections the main drugs are antibiotics (27.2%), anti ulcerative (24.5%) and then analgesics(22.7%) for pain reliever in fig(4b)

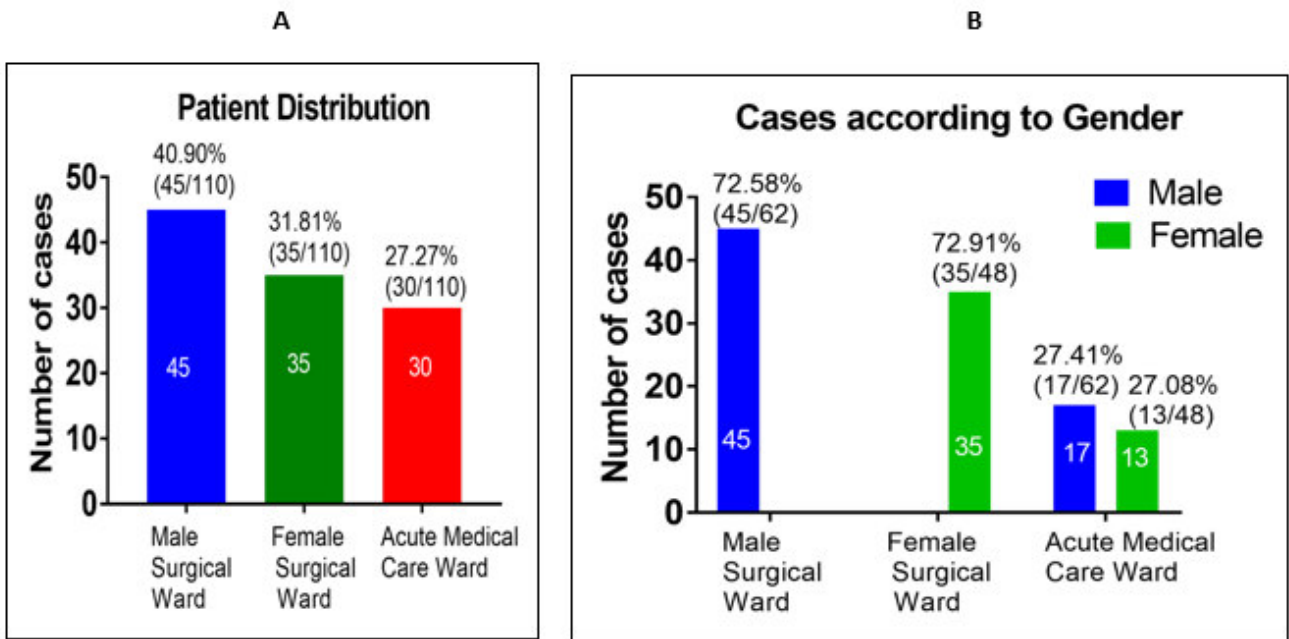


Figure 1. Number of hernia cases in different departments and cases according to gender wise in tertiary care hospital, Proddatur, YSR Kadapa District, Andhra Pradesh in India. **A.** Hernia patient distribution in three different Surgical wards: Male surgical ward, Female surgical ward and Acute Medical care ward. **B.** Number of Male and Female hernia cases in Male Surgical ward, Female surgical ward and Acute medical Care ward.

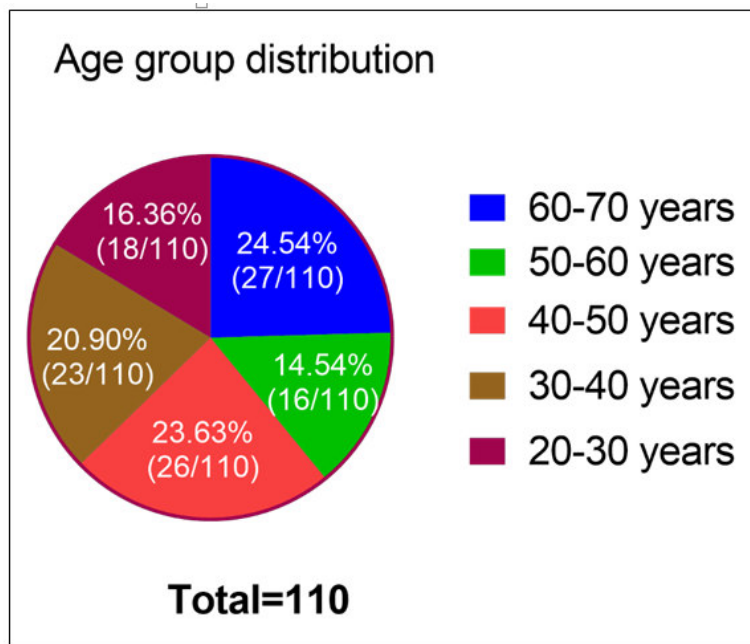


Figure 2. Hernia patients distribution based on age in Tertiary care hospital. Number of hernia cases and their percentage are presented in the pie chart. Age groups were started with the group of 20-30 years to the group of 60-70 years with the increment of 10 years.

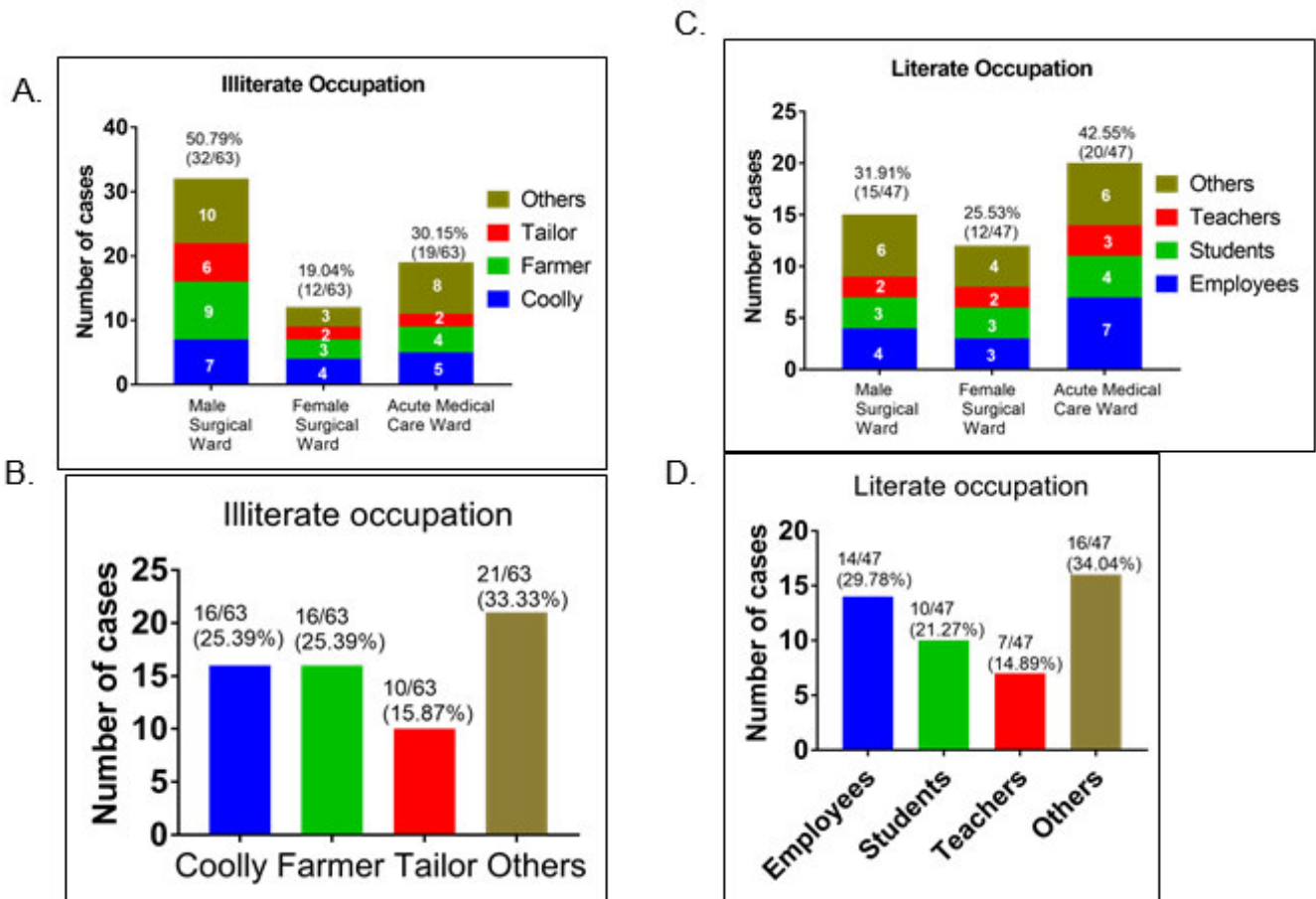


Figure 3. Farming and coolly illiterate communities and Employees in the literate occupation group were more affected by Hernia. **A.** Distribution of different categories of illiterate occupation groups in three surgical wards. **B.** Number of hernia cases in each group of illiterate occupation. **C.** Distribution of different categories of literate occupation groups in three surgical wards. **D.** Number of hernia cases in each group of literate occupation.

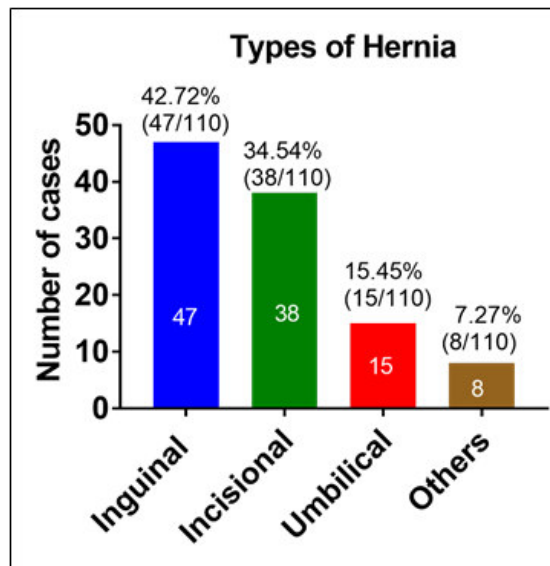


Figure 4 Inguinal Hernia type cases were found highest among different types of Hernia. Number of cases in different types of hernia was presented along with their percentages. There were 8 patients whose specific type of hernia data not available.

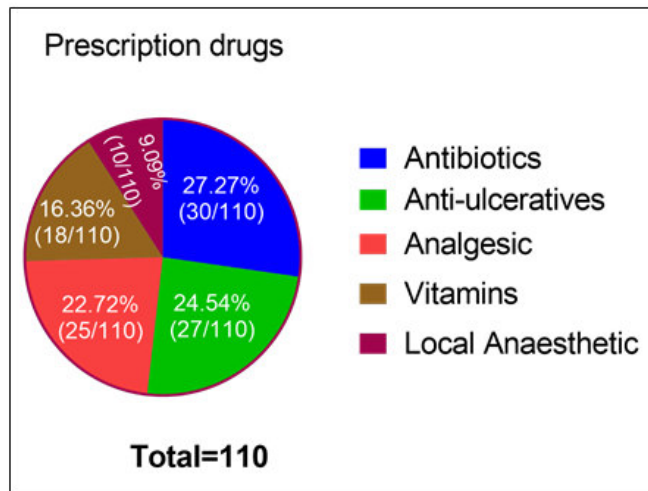


Figure 5 Antibiotics were found higher prescription drugs compared to anti-ulcerative and analgesic drugs. The percentage of hernia patients received various prescription drugs were calculated and presented in the pie chart indicating the number of patients and their percentage.

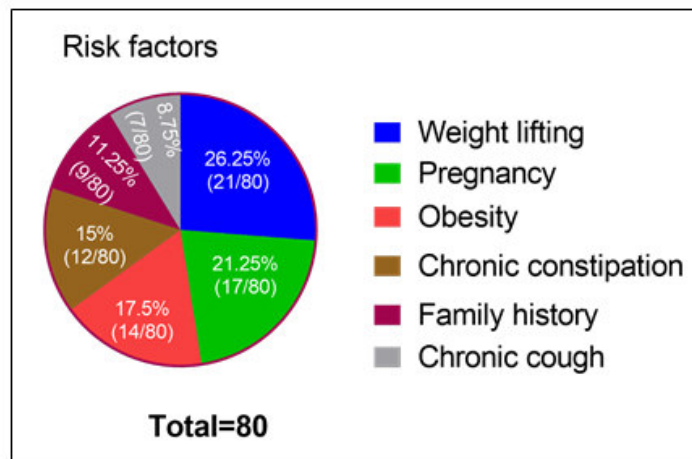


Figure 6 Risk Factors assessment revealed Weight lifting as top risk factor for Hernia in this cohort. Risk factors noted in the patients charts were listed and calculated the number of patients in each category and presented the number of cases and their percentage. The data was available from 80 patients out of 110.

DISCUSSION

Hernia is one of the debilitating health problems if it is not diagnosed and properly treated on time. There are reports on the hernia patients’ distribution in the tertiary care hospitals regionally, but there are no studies reported on hernia patients distribution in the tertiary care hospital, Proddatur, YSR Kadapa District, Andhra Pradesh, India. It is very important to determine the distribution of hernia patients in this area, which will provide some basic information as well as pathophysiological conditions that can be used by clinicians and even patient community to aware about his disease incidence and existing facilities in the hospital. These type of studies have been suggested geographical which help to predict the prevalence of hernia especially inguinal hernias ([5].

In the present study we made an effort to do evidence based Hernia repair in a tertiary care hospital, Proddatur, YSR Kadapa district, Andhra Pradesh in India. We observed male hernia patient incidence (Figure 1) in our region as reported earlier [4, 5]. In agreement with the previous study on age association with hernia incidence [4], we found highest number of hernia patients (24.54%) (Figure 2) in the age

group of 60- 70 years. This could be due to the influence of risk factors as well as the age related decrease of muscle strength and connective tissue [9, 10]. While occupation has been reported as one of the critical factor for development of hernia, the precise occupation based stratification of hernia incidence has not been investigated in the semi-urban tertiary care hospitals. We found illiterate Coolly (daily wage workers) and Farmer occupation contributed higher incidence of hernia (>50%, Figure 3C). These are the patients who have been doing weight lifting for long duration in their lifespan and weight lifting (Figure 6) has been demonstrated as one of the risk factors for hernia [2, 5, 11, 12].

We observed that the prescribers are not prescribing drugs based on symptoms. Drugs are given to the patient before going to surgery. Hence, it is vital for the health care professionals to practice good medical and drug history taking and record continuation, as well as providing correct treatment based on the disease condition/symptoms. Symptoms may range from a painless bulge to considerable pain, Swelling and discolouration. The main reason for taking patient related factors in order to identify the patient with risk of developing Hernia. Male patients at the age 60-

70yrs and 40-50yrs are associated with greater risk than the patients from rest of population, and is seen in between the age of 20-30yrs and 50-60yrs are less common according to the Proddatur, Govt Hospital. Local anaesthesia is preferable to the patient before going to surgery. Hernia is not a spreadable disease but can be seen in any group of people, based on the risk factors, the main risk factors seen in this study are weight lifting (26.25%), Pregnancy (21.25%). Smoking and diabetes are also known reasons for Hernia, but we do not have this information on our patient cohort.

All the details of the patients should be analysed like age, Gender, Occupation, any previous surgery [8]. Patients are admitted with main symptoms of pain or swelling in the abdominal region, A life time risk of developing Inguinal Hernia is 3% for women and 27% for men [13]. Worldwide 20 million people under go Hernia Repair annually. Mainly the risk factors are weight lifting (26.2%), pregnancy (21.2%), obesity (17.5%), chronic constipation (15%). Male affects more when compared to female according to the collected data. Radical prostatectomy has been demonstrated as one of the risk factor for hernia with the hernia incidences of 17% (9 of 53), 14% (6 of 43 and 1.4% (1 of 74) in radical retropubic prostatectomy (RRP), laparoscopic radical prostatectomy(LRP) or radiotherapy groups respectively [14]. In our study we do not have data on the previous surgery details.

The type of Hernia is based on the anatomical position of the organ. Many of the patients are facing Inguinal Hernia (42.72%) due to rupturing of the abdominal layer and then Incisional Hernia with (34.54%), obesity is the one of the

risk factor for causing Umbilical Hernia (15.4%). Less common type are Epi gastric and Femoral Hernia (7.27%) Clinical Examination is required for the patients and should confirm the type of Hernia, patient is suffering. The main investigations are X-ray and ECG were done for pre-operative, to know the patient condition. Patients should have long acting local anesthetic infiltration preoperatively for postoperative pain control [11].

Surgery is the main method to recover Hernia, During this process Surgical mesh is used, which is a medical device to provide additional support to the weakened or damaged tissue. It is a synthetic material which may be Absorbable, non absorbable or combination [15]. Laparoscopic is the other method for surgical repair. Serious complications can occur when Hernia become incarcerated or irreducible (that can't be pushed back through the abdominal wall) which can lead to a Strangulated Hernia, where the blood supply to the Hernia is cut off. It is a surgical emergency requiring an urgent operation. During this Strangulated Hernia the main symptoms are sudden pain, bleeding, Bulge that turn to red purple [15]. After Surgery Hernia Belt may be useful for some patients. When the internal inflammation is there it can cause Hernia pain or can cause another to occur [12].

In conclusion, our data demonstrated the male predominance in hernia occurrence. Age and occupation mainly contribute the incidence of hernia. Weight lifting, pregnancy and obesity are the main risk factors. Future studies are warranted with higher sample size to identify significant risk factors associated with occupation.

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How to cite this article: Jyothisna Bollu, Dr. Veera Sekhar Sunkara , Dr Sivaram Vankadara. Study of Demographic, Risk factors and Evidence based Hernia repair and its Management in Adults in Tertiary care Hospital. *Int J of Allied Med Sci and Clin Res* 2020; 8(4): 781-788.

Source of Support: Nil. **Conflict of Interest:** None declared.