



A PROSPECTIVE STUDY ON PREDISPOSING FACTORS FOR VARIOUS VENTRAL HERNIA CASES IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Ventral hernias may arise from an area of weakness in anterior abdominal wall such as umbilicus, sites of previous surgery or from the areas where musculature is weak. They are commonly dealt surgical problem in our day to day clinical practice associated with various complications/recurrence. This prospective study was conducted to analyze various risk factors responsible for ventral hernia formation and in formulating targeted effective pre-operative optimization of those risk factors thereby improving post-operative outcomes. Among various predisposing factors, females (63.33%), history of previous surgery (55%), old age (38.3%) formed the majority in this study. Prevention of ventral hernia and targeted preoperative optimization has gained popularity in recent times to achieve better post-operative outcomes.

KEYWORDS : Ventral hernias, predisposing factors, targeted pre-operative optimization.

INTRODUCTION

An abnormal protrusion of a viscus or a part of viscus or pre-peritoneal content through weakness in the anterior abdominal wall is known as the ventral hernia/ anterior abdominal wall hernia.⁽¹⁾ They are frequently encountered in clinical practice with incidence of 15-20%.^(2,3) Ventral hernias may be primary (umbilical/ paraumbilical, epigastric, lumbar, spigelian) or secondary/ incisional (related to previous surgery and trauma).

As per National operative statistics, incisional hernia is the most common among ventral hernias with incidence of 15%-20%, while epigastric & para-umbilical/umbilical accounts for 10%. First documentation of ventral hernia (para-umbilical hernia) dates back to 100 A.D by Celsus and the first repair was done by Stoser in 1894.

Major risk factors involved in ventral hernia formation are obesity, old age, multiparity, prostatism, sleep apnea, emphysema & COPD, whereas defective wound healing, malnutrition, surgical site infection and technical error contributes to the formation of incisional hernia.^(1,4)

This study aims to analyze various risk factors predisposing to the formation of ventral hernia & also in formulating effective & targeted pre-operative optimization in those high risk patients.

Aims And Objectives

To analyze various risk factors predisposing to the formation of ventral hernias.

MATERIAL AND METHODS

Type of study:

This prospective, comparative study was conducted in the Department of General Surgery at J.A Group of Hospitals, Gwalior (M.P) from January 2020 to June 2021 in a group of 60 patients after obtaining well informed and written consent from them.

Inclusion Criteria:

Patients aged between 18-60 years diagnosed to have ventral hernia clinically and ultrasonographically with defect size < 10cm were included in this study.

Exclusion Criteria:

Patients with age < 18 years were excluded from this study

Methodology:

- Data was collected through detailed questionnaires and clinical examination from patients who were admitted in surgical wards of J.A. Group of Hospitals, Gwalior requiring surgery for ventral hernias.
- All necessary investigations were performed.

OBSERVATION & RESULTS

Table 1: Age and Sex Distribution in Study Group

Age/Sex	18-30	31-45	46-60	Total
Male	02 (3.33%)	09 (15%)	11 (18.34%)	22 (36.67%)
Female	01 (1.67%)	17 (28.33%)	20 (33.33%)	38 (63.33%)
Total	03 (5%)	26 (43.33%)	31 (51.67%)	60 (100%)

In this study, about 51.67% (31 patients) were above 45 years of age and 63.33% (38 patients) were females indicating higher incidence of ventral hernias among elderly and in females. Mean age among the study group was 44±2.83 years.

Table 2: Distribution of various ventral hernias among old age

Predisposing Factor	Epigastric hernia	Para-umbilical hernia	Incisional hernia-midline	Incisional hernia-lateral
Age > 50	04(6.67%)	09(15%)	09(15%)	01(1.67%)

Among the study group, the incidence of para-umbilical hernias and midline incisional hernias were higher among elderly accounting for 15% (09 patients) each.

Table 3: Distribution of incisional hernias among study population

Predisposing Factor	Incisional hernia-midline	Incisional hernia-lateral
H/O Previous Surgery	25(41.67%)	08(13.33%)

Among the patients with H/O previous surgery, midline incisional hernias were common accounting for 41.67% (25 patients).

Table 4: Distribution of various ventral hernias among overweight/obese (based on Asian criteria BMI > 23)

Predisposing Factor	Epigastric hernia	Para-umbilical hernia	Incisional hernia-midline	Incisional hernia-lateral
Overweight/Obese	00	03(5%)	01(1.67%)	00

Out of 60 patients in this study, about 6.67% (04 patients) were overweight/obese & among them 5% (03 patients) had para-umbilical hernias while 1.67% (1 patient) had midline incisional hernia.

Table 5: Distribution of various ventral hernias among COPD patients

Predisposing Factor	Epigastric hernia	Para-umbilical hernia	Incisional hernia-midline	Incisional hernia-lateral
COPD	00	00	04(6.67%)	00

In this study, 04 patients were diagnosed to have COPD, & all of them had midline incisional hernias

Table 6: Distribution of various ventral hernias among diabetics

Predisposing Factor	Epigastric hernia	Para-umbilical hernia	Incisional hernia-midline	Incisional hernia-lateral
Diabetes mellitus	02(3.34%)	01(1.67%)	02(3.34%)	00

Among the study population, 05 patients were diabetic. The incidence of epigastric and midline incisional hernias were 3.34% (02 patients) each, while 01 patient had para-umbilical hernia.

Table 7: Distribution of various ventral hernias among hypothyroid patients

Predisposing Factor	Epigastric hernia	Para-umbilical hernia	Incisional hernia-midline	Incisional hernia-lateral
Hypothyroidism	00	01(1.67%)	0	01(1.67%)

In this study, 02 patients were diagnosed to have hypothyroidism, and among them 01 patient had para-umbilical hernia while the other had lateral incisional hernia.

DISCUSSION

Ventral hernia represents a heterogenous entity with each of them having unique pathological and clinical characteristics. A thorough understanding of these conditions is needed as they frequently affect the individuals with multiple comorbidities, significant morbidity and mortality associated with them & also the negative impact on life quality.

Hence better knowledge and understanding is needed in associating various modifiable risk factors with ventral hernia formation in order to implement targeted pre-operative optimization. This helps in achieving better post-operative outcomes and also in the reduction of health cost burdens.

Among various predisposing factors, history of previous surgery (55%) and old age (38.3%) formed the majority in this study.

The higher incidence of ventral hernias among elderly can be attributed to various factors such as associated degenerative diseases, decreasing muscle tone with the age & also defective host-defense mechanism causing poor wound healing.

In a prospective study by **Kharde et al**, about 58% (n=29) of the patients with ventral hernia were above 50 years.⁽⁵⁾ Similar results were noted in a study by **Aly Saber et al** where most of the patients (n=200) were above 40 years⁽⁶⁾, while in a study by

Joseph Mathew et al about 29.14% of the patients (n=58) were above 50 years which is in accordance with this study.⁽⁷⁾

In this study, incidence of ventral hernia was higher among females aged between 31-60 accounting for about 61.67%. This can be mainly correlated to various gynecological procedures such as LSCS, tubectomy, abdominal hysterectomy. The lower abdominal incision in index surgical procedure predisposes to the formation of incisional hernias as the posterior rectus sheath is deficient below arcuate line. There is increased predisposition to wound infection and also poor holding of sutures because of the abundant subcutaneous fat in lower abdomen thereby causing incisional hernia.

Similar results were stated by **Vikram et al** in which 90 patients out of 170 (52.94%) had previous surgical history and about 84.44% of them were females.⁽⁸⁾

Also in a study by **Joseph Mathew et al**, 77.6% of the patients were females (n=155) and about 33.7% of the patients had history of previous surgery with the majority of index surgery being gynecological procedure (22.6%) which is in accordance with this study.⁽⁷⁾

As per old literature, para-umbilical hernias and incisional hernias were more common among females while epigastric hernias in males. But a retrospective analysis by **Dabbas N et al** suggested that about 70.2% patients (249 out of 345) males were diagnosed to have para-umbilical hernias.⁽⁹⁾ Similarly, a study by **Malangoni MA et al** showed about 60.7% males had para-umbilical hernias⁽¹⁰⁾. This increasing trend of ventral hernias in males can be explained due to increased incidence of obesity in males, reduced parity among females and longer life expectancy among males.

In case of obese people, abundant intra-abdominal and omental fat infiltrates subcutaneous tissue and fascia rendering them weak and also the increased intra-abdominal pressure causes poor wound healing capacity among them.

Out of 60 patients in this study, about 6.67% (04 patients) were overweight/obese. Similar results were observed in a prospective study by **Jospeh Mathew et al** where 24.6% of the patients were obese, while in a study by **Kharde et al**, about 32% of the patients (n=16) were obese.^(5,7)

In diabetics, because of defective host defense mechanism there are increased chances of wound infection contributing to higher incidence of incisional hernias.

In this study, 8.33% of the patients (n=5) were diagnosed to have diabetes and among them about 3.34% of the patients of the patients had midline incisional hernias. In a similar study by **Kharde et al** about 30% of the patients (n=15) were diabetic.⁽⁵⁾

Also a cross sectional study by **Ryan Howard et al** identified females, obesity, uncontrolled diabetes mellitus, chronic smoking & unhealthy alcoholism to be significantly associated with postoperative complications.⁽¹¹⁾

In recent times, the prevention of ventral hernia has gained popularity and this can be achieved by controlling the modifiable patient risk factors such as obesity, COPD, diabetes mellitus.

Hence there is growing interest in targeted preoperative optimization such as programmed weight loss, proper glycemic control, incentive spirometry etc. has gained popularity in recent times to in achieving better postoperative outcomes & early return to baseline functional status. In order

to achieve this, a better understanding is needed in associating the patient's specific co-morbidities to various post-operative morbidity, mortality and the outcomes following risk reduction.

CONCLUSION:

- Majority of patients diagnosed to have ventral hernia were above 45 years.
- The incidence of ventral hernia was higher among females (n=38).
- The incidence of secondary (incisional) hernia was higher among females.
- Among various predisposing factors, history of previous surgery and elderly formed the majority in this study.
- Prevention of ventral hernia has gained importance and this can be achieved by effective control of the modifiable patient risk factors such as obesity, COPD, diabetes mellitus, smoking & alcoholism.
- Targeted pre-operative optimization such as programmed weight loss, proper glycemic control, incentive spirometry has gained popularity in recent times to achieve better post-operative outcomes.
- Various patient related factors such as old age, co-morbidities, prior surgical history and also procedure related factors should be considered before choosing ideal method in order to achieve the desired result.

Conflict Of Interest: None

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Ethical Approval:

This Study was approved by Institutional Ethics Committee, G.R.Medical College, Gwalior

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