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EVALUATION OF CORRELATION BETWEEN LOW LYING PUBIC TUBERCLE IN RELATION TO DEVELOPMENT OF INGUINAL HERNIA: A PROSPECTIVE HOSPITAL STUDY

General Surgery

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ABSTRACT

Background: Low lying pubic tubercle can cause the changes in the structural anatomy of muscle. These changes can lead to ineffective shutter mechanism and predispose to inguinal hernia. **Materials and Methods:** This study was conducted in the department of General Surgery, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamil Nadu during the period of January-December 2023. The study protocol was approved by Institutional Human Ethics Committee, Sree Mookambika Institute of Medical Sciences. A total of 60 patients were included in the study based on inclusion and exclusion criteria. They were divided into 2 groups each of 30 subjects. Study procedure was explained and informed consent was obtained. All the patients demographic and clinical data was collected and analyzed. Statistical Package for Social Sciences (SPSS 2,0) version used for analysis. **Results:** This study included 60 subjects divided into two groups each of 30 patients. Maximum number of subjects were age between 51-60 years in both groups. Mean age compared between both groups not showed any significant difference. ST, SS, SS/ST, weight/ST and weight/ST showed significant difference compared group-I with group-II. **Conclusion:** The study results concluded that patients had low lying pubic tubercle are at high risk of developing inguinal hernia.

KEYWORDS

Abdomen, Hernia, inguinal, SS, ST, pubic tubercle

INTRODUCTION

Inguinal canal is a potential weak area in the males. It was measured an average of 3.75 cm and stretched from deep to superficial inguinal rings. Inguinal hernia can be explained as protrusion of abdominal cavity contents through the inguinal canal or fascia transversalis.[1,2] These may contain small bowel, omentum and viscera as the contents. It was observed that smoking, COPD, obesity, vascular diseases, bladder outlet obstruction and open appendectomy are risk factors to cause hernia.[3,4] The prevalence rate of inguinal hernia is more in males than females. It was observed that men with above 45 years have 40% chance to develop hernia.[5] Based on the symptoms and pathology, inguinal hernia is classified into two types. Hernia can be classified asdirect and indirect. In both most common site is zone of weakness through which herniation occur. The hernia develops within a single weak area called myopectineal orifice. Hernia usually presents as bluge in the groin which becomes more prominent while coughing, straining, standing up and briskwalking. Initially the patients experience it as mild discomfort which increases as disease progresses increases .[6-8] The rate of disease progression depends on the lifestyle and the exposure to risk factors. Treatment of hernia can be an elective procedure or emergency surgery based on the signs and symptoms at presentation. It was observed that height, weight, obesity, length of ST, SS, SS/ST, Height/ST and weight/ST have relation with development of hernia.[9,10] The present study aimed to evaluate the correlation between low lying pubic tubercle in relation to development of inguinal hernia.

MATERIALS AND METHODS

Study Design: Prospective cross sectional study
Study Period: January-December 2023
Study Settings: This study was conducted in department of General Surgery, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Kanyakumari (Dist), Tamil Nadu.

Inclusion Criteria

- Above 18 years age
- Diagnosed with inguinal hernia (Group-I)
- All normal attendants who were with inguinal hernia patients with similar age, height and weight (Group-II)

Exclusion Criteria

- History of pelvic surgery
- Obesity
- Hernia associated with obstruction, hydrocele, irreducible and strangulated.

Groups

Group-I: Cases (n=30)
Group-II: Control (n=30)

Procedure

A total of 60 patients were included in the study based on inclusion and exclusion criteria. They were divided into two groups of each of 30. Study procedure was explained to each patient in both groups and informed consent was obtained. Selected patients were asked to lie in supine position on the observation bed. Patients were asked to keep both of their lower limbs straight so that both the anterior superior iliac spine was at the same level. SS and ST lines were drawn and length was measured. All the patient's demographic data like age, weight, height, length of SS and ST lines were noted.

Statistical Analysis

The data was expressed in number, percentage, mean and standard deviation. Statistical Package for Social Sciences (SPSS 20.0) version used for analysis. Chi square test was applied to find the statistical significant between the groups at 95% confidence interval. P value less than 0.05 considered statistically significant at 95% confidence interval.

Results

This study was included 60 patients each group of 30 subjects. In both groups maximum number of patients with age between 51-60 years. Comparison of age distribution between the groups not showed any significant difference (Table-1). Mean age of group-I is 45.32 and group-II is 42.78 was not showed any significant difference (Graph-1). Comparison of mean height and weight not showed between the group-I and II not showed any significant difference. Group-I showed low SS, ST, SS/ST, height/ST and weight/ST values compared to group-II these difference showed significant difference (Table-2).

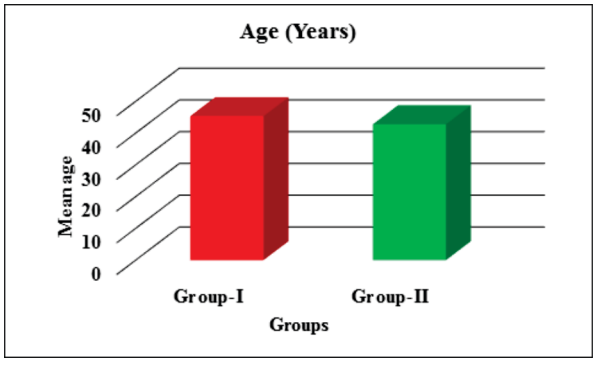
Discussion

Anatomy of the inguinal region and pelvis has always proved to be a major factor for the development of inguinal hernia. The muscles, ligaments and various tendons act as defence mechanisms that prevent hernia formation.[11] The present study has focused on indirect inguinal hernias which passes through the deep inguinal ring, traverses the inguinal canal and exits out the superficial ring. The lateral abdominal wall muscles which include the transversus abdominis and the internal oblique muscle, form the conjoint tendon and offer reinforcement only in the medial half of the inguinal canal as it arches over the deep ring which makes it the weakest part of the posterior wall. A low pubic tubercle is correlated with a narrow origin of the internal oblique muscle which further weakens the posterior wall at the deep ring,

which in turn increases the risk of development of indirect inguinal hernia. The present study shows that men with age between 51-60 years had 53-56 % of risk to develop the hernia with mean age of 42 to 45 years.[12,13] Basu I et.al study concluded that prevalence rate of hernia is more common between age of 42-57 years. It is less common in young age group than old age. Some studies showed that development of hernia is relatively common in childhood and old age.[14] This can be explained that most of patients with poor economic status do not come to hospital in initial stage of disease. Cano et.al., explained that there is relationship between the height and weight in the development of hernia. These can be considered risk factors in disease progression.[15] In our study also case group has less height and more weight compared to control group. These studies concluded that height, weight and obesity can be important risk factors to develop hernia. A study was done by Harris and white found that there is a significant association between the length of inguinal ligament and development of hernia. There two are directly proportional. The present study length of ST, SS, ST/Weight and ST/height are high in case group compared to control group. Stoppa et.al study also observed that hernia patients had more length of ST, SS and SS/ST than control group.[17] This study result help us to determine whether the functional significance of the inguinal region is modified by anatomic variations be in bone, muscle and ligaments.

Table-1: Distribution Of Patients Based On Age In Group-I And Group-II

Age (Years)	Group-I (n=30)		Group-II (n=30)	
	Number	Percentage (%)	Number	Percentage (%)
30-40	6	20.00	5	16.67
41-50	8	26.67	8	26.67
51-60	16	53.33	17	56.66
Total	30	100.00	30	100.00



Graph-1: Comparison Of Mean Age Between Group-I And Group-II

Table-2: Comparison Of Mean Demographic And Clinical Observations Between The Group-I And Group-II

Observation	Group-I (n=30) (MEAN±SD)	Group-II (n=30) (MEAN±SD)	p value
Age (years)	45.32±3.19	42.78±2.93	0.07
Height (cm)	152.39±2.51	154.19±3.16	0.06
Weight (kg)	65.42±1.55	64.28±3.18	0.07
ST	7.49±1.93	6.75±1.03*	0.01
SS	24.39±0.45	23.18±1.72*	0.03
SS/ST	3.25±0.23	3.43±1.66*	0.04
Height/ST	20.34±1.30	22.84±3.07*	0.03
Weight/ST	8.73±0.80	9.52±3.08*	0.02

(*p<0.05 significant compared group-I with group-II)

Conclusion

The study results were concluded that anatomical structure of pelvis seems to be a major factor in the development of inguinal hernia. These can be evidenced by the changes in ST and SS lengths. It was also observed that height and weight also risk factors to cause hernia. Early identification and prevention of exposure to risk factors can prevent the progression of hernia.

Limitations of Study

The major limitation of study is sample size which may not be generalized to all population. Due to single center study may not explain the effect of external factors in the development of hernia.

Conflict of Interest: Nil
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