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CLINICAL ACUMEN IN DIFFERENTIATION OF DIRECT AND INDIRECT INGUINAL HERNIA IN ADULTS.

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ABSTRACT

BACKGROUND: Inguinal hernia is a frequent case to come across in the outpatient clinic as well as in emergency. **OBJECTIVE:** To determine the diagnostic accuracy of clinical acumen in differentiating indirect from direct inguinal hernia in adult population by keeping surgery-open inguinal hernia repair (tension-free with mesh/Lichtenstein or by reconstruction of the floor with tissue)- as gold standard. **PLACE AND DURATION OF STUDY:** This cross sectional study was executed at department of General Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. The duration of the study from 01/01/2023 to 31/12/2023 for one year. **PATIENTS AND METHOD:** This cross sectional study was executed at department of General Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. The duration of the study was from 01/01/2023 to 31/12/2023. On surgery, position of hernia will be noted and direct or indirect hernia will be confirmed through the scrotum towards the external inguinal (as per operational definition). All this information will be recorded on pro-forma (attached). **RESULTS**: For this study the mean age of the patients was 45.42±15.33 years, 68(68%) and they were married. The sensitivity, specificity, PPV, NPV and diagnostic accuracy of clinical findings were 89.36%, 79.25%, 79.25%, 89.36% & 84% respectively taking surgical findings as gold standard.

CONCLUSION: According to this study we may conclude that clinical acumen has good diagnostic accuracy in differentiating indirect from direct inguinal hernia in adult population by keeping surgery as gold standard.

KEY WORDS: Clinical Acumen, Inguinal Hernia, Adult Population

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INTRODUCTION

Inguinal hernia is a frequent case to come across in the outpatient clinic as well as in emergency. Because of its frequency, it remains a common, yet an important medical problem.[1,2] An extremely common operation, that surgeons perform, is inguinal hernia repair. Not less than eight hundred thousand repairs are done annually.[3] An inguinal hernia is defined as an abnormal bulge or protrusion of tissue that occurs in the groin area. It occurs within the inguinal canal and can extend into the scrotum. Patients usually present with a bulge or pain in the groin area. In order to avoid any complications, surgeons advise for repairing symptomatic hernias.[4,5] Currently, proper history taking and physical examination does play a pivotal role in establishing the diagnosis of inguinal hernia, wherein diagnostic modalities are required every once in a while. Nonetheless, prior to surgical intervention, a common stance regarding physical examination is that it does not differentiate[3] between indirect and direct inguinal hernias accurately.[3] Basically, clinical acumen is comprehensive aptitude that polishes clinical approach to judge a pathological malady, and it helps in taking decision correctly.[3] Day case management of hernia repairs, routine use of prophylactic antibiotics, use of mesh and open repair of hernias were the practices of the majority of surgeons, although differences were noted in specific groups of surgeons.[6] The available literature on the topic showed that clinical acumen can be helpful in detecting indirect and direct inguinal hernia and can help to prevent more invasive procedures and hernia can be repaired by less invasive procedures.[7] But not much work has been done in this regard as the procedure has less specificity and also there is lack of local data. So we want to conduct this study to confirm the previous results. As per location of groin region, these hernias are divided into indirect, direct, and femoral.[8] This will help to improve our practice as well as we will get local evidence and in future we will be able to implement guidelines for better detection and prognosis of patients of inguinal hernia by using updated data. A study concluded that the sensitivity and specificity of clinical acumen for differentiation of direct and indirect inguinal hernia were 89.4% and 33.7%; it shows a very weak specificity of clinical acumen, whereas its sensitivity remains high.[9] The overall prevalence of direct inguinal hernia was 64.3% among all the inguinal hernia.[10] Rationale of this study is to determine the diagnostic accuracy of clinical acumen in differentiating indirect from direct inguinal hernia in adult population by keeping the surgery-open inguinal hernia repair (tension-free with mesh/Lichtenstein or by reconstruction of the floor with tissue)- as gold standard.

PATIENTS AND METHOD

This cross sectional study was executed at department of General Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. The duration of the study was from 01/01/2023 to 31/12/2023. After taking informed consent and demographic detail, one hundred patients were enrolled. An inguinal hernia is examined by asking the patient to stand up in order to increase intra-abdominal pressure, with the groin and scrotum fully exposed, and the examiner looks at the swelling from in front to determine the side, size and shape of the swelling. An initial inspection is conducted to identify any abnormal bulges in the groin or scrotum. If no visible bulge is found, palpation is utilized to ascertain the presence of a hernia. This involves feeling both from the front and the side of the swelling. When examining from the front in males, it is important to determine whether the swelling is a hernia or a true scrotal mass by attempting to feel for the upper edge of the swelling above the normal spermatic cord. If the upper edge is not discernible, indicating the swelling extends into the inguinal canal, it is

classified as a hernia. During side palpation, the examiner should evaluate various characteristics of the swelling, including its position, temperature, shape, size, tension, composition (solid, fluid, or gaseous), and whether it can be reduced. Palpation involves advancing the index finger to explore the inguinal canal. The patient is then instructed to cough, which can reveal any abnormal bulges and help determine if the hernia is reducible. Additionally, examining the contra-lateral side provides the clinician with a chance to compare the size and extent of any hernia present on both sides.

While very difficult to ascertain, there are certain physical examination maneuvers that can be performed to help distinguish direct vs indirect inguinal Hernias. The inguinal occlusion test involves the examiner using a finger to obstruct the internal inguinal ring while the patient is asked to cough. A controlled impulse during this action indicates an indirect hernia, whereas a persistent impulse suggests a direct hernia. If the cough impulse is felt at the tip of the finger, it points to an indirect hernia, while an impulse felt on the back of the finger indicates a direct hernia. When physical examination results are compared to surgical findings, there is slightly over a 50% likelihood of accurately identifying the type of hernia.. On surgery, position of hernia will be noted and direct or indirect hernia will be confirmed through the scrotum towards the external inguinal (as per operational definition). All this information will be recorded on pro-forma (attached).

RESULTS

One hundred patients were enrolled in this study. The mean age of the patients was 45.42±15.33 years with minimum and maximum ages of 17 & 75 years respectively. Table 01 51 According to this study 68(68%) patients were married and 32(32%) patients were unmarried. The study results showed that the mean duration of symptoms of the patients was 25.32±16.55 weeks with minimum and maximum duration of 1 & 96 weeks respectively. Table 02 In our study inguinal hernia was detected positive in 47(47%) patients diagnosed clinically. The study results showed that the sensitivity, specificity, PPV, NPV and diagnostic accuracy of clinical findings was 89.36%, 79.25%, 79.25%, 89.36% & 84% respectively, taking surgical findings as gold standard. Table 03 In patients having age ≤50 years the sensitivity, specificity and diagnostic accuracy of the clinical diagnosis of the patients was 86.21%, 80.56% & 83.08% respectively taking surgical findings as 53 gold standard. Similarly, in patients having age >50 years the sensitivity, specificity and diagnostic accuracy of the clinical diagnosis of the patients was 94.44%, 76.47% & 85.71% respectively, taking surgical findings as gold standard., taking surgical findings as gold standard. Similarly, Table 04-05 In patients having duration of symptoms ≤30 weeks the sensitivity, specificity and diagnostic accuracy of the clinical diagnosis of the patients was 86.67%, 79.41% & 82.81% respectively taking surgical findings as gold standard. Similarly, in patients having duration of symptoms >30 years the sensitivity, specificity and diagnostic accuracy of the clinical diagnosis of the patients was 94.12%, 78.95% & 86.11% respectively, taking surgical findings as gold standard. Table 06 specificity and diagnostic accuracy of the clinical diagnosis of the patients was 87.5%, 76.67% & 81.48% respectively, taking surgical findings as gold standard. Similarly,

TABLE 01 SUMMARY STATISTICS OF AGE IN YEARS.

Age (Years)	N	100
	Mean	45.42
	Standard Deviation	15.33
	Minimum	17.00
	Maximum	75.00

TABLE 02 SUMMARY STATISTICS OF DURATION OF SYMPTOMS (WEEKS).

Duration of symptoms (weeks)	N	100
	Mean	25.32
	Standard Deviation	16.55
	Minimum	1.00
	Maximum	96.00

TABLE 03 FREQUENCY DISTRIBUTION OF CLINICAL DETECTION OF INGUINAL HERNIA.

		Frequency	Percent
Clinical Diagnosis of Inguinal Hernia	Positive	53	53.0
	Negative	47	47.0
	Total	100	100.0

TABLE 04 VALIDITY OF CLINICAL DETECTION OF INGUINAL HERNIA TAKING SURGICAL FINDINGS AS GOLD STANDARD.

		Surgical Inguinal Hernia		Total
		Positive	Negative	
Clinical Inguinal hernia	Positive	42 89.4%	11 20.8%	53 53.0%
	Negative	5 10.6%	42 79.2%	47 47.0%
Total		47 100.0%	53 100.0%	100 100.0%

Sensitivity	89.36%
Specificity	79.25%
Positive Predictive Value	79.25%
Negative Predictive Value	89.36%
Diagnostic Accuracy	84%

TABLE 05 VALIDITY OF CLINICAL DETECTION OF INGUINAL HERNIA TAKING SURGICAL FINDINGS AS GOLD STANDARD STRATIFIED BY AGE.

Age Groups	Clinical Diagnosis	Surgical Inguinal Hernia		
		Positive	Negative	Total
≤50	Positive	25 86.2%	7 19.4%	32 49.2%
	Negative	4 13.8%	29 80.6%	33 50.8%
>50	Positive	17 94.4%	4 23.5%	21 60.0%
	Negative	1 5.6%	13 76.5%	14 40.0%

Clinical Findings	Age Groups ≤50	>50

TABLE 06 VALIDITY OF CLINICAL DETECTION OF INGUINAL HERNIA TAKING SURGICAL FINDINGS AS GOLD STANDARD STRATIFIED BY DURATION OF SYMPTOMS.

Duration of symptoms	Clinical Diagnosis	Surgical Inguinal Hernia		Total
		Positive	Negative	
≤30	Positive	26 86.7%	7 20.6%	33 51.6%
	Negative	4 13.3%	27 79.4%	31 48.4%
>53	Positive	16 94.1%	4 21.1%	20 55.6%
	Negative	1 5.9%	15 78.9%	16 44.4%

DISCUSSION

Indeed, learning the skill for differentiating between direct and indirect inguinal hernia is the basic principal to be acquired both by undergraduate and postgraduate medical pupils. Globally, repairing inguinal hernias surgically is one of the most frequent interventions undertaken. Given the risk of gut strangulation, traditionally, it is 74 recommended to surgically correct the hernia defect sooner rather than later.[8] A number of various anterior abdominal wall hernias including those of the groin are directly related to lifespan. Say, among the hernias, eighty per cent are of inguinal type. Likewise, only five per cent hernia is of femoral variety. Meanwhile, the rest are miscellaneous comprising of the umbilical, the incisional hernia to name a few.[11, 12] In this study the sensitivity, specificity, PPV, NPV and diagnostic accuracy of Clinical Acumen in differentiating indirect from direct inguinal hernia was 89.36%, 79.25%, 79.25%, 89.36% & 84% respectively, taking surgical findings as gold standard. Some of the studies are discussed below along with their results. Wouter G. Tromp et al[7] concluded in their study that the diagnostic authenticity in differentiating indirect from direct inguinal hernias increases provided with the combined application of hand-held Doppler ultrasound and clinical test named as the ring occlusion. Henceforth, using this tactic further management plan 75 becomes obvious in respect of correcting the hernia defect by laparoscopic intervention. The numerical data showed that four research works were undertaken in order to assess the authenticity of radiological ultrasound in differentiating between direct and indirect inguinal hernias.[13,14] All of the four researches were of retrospective pattern and varying from nineteen to one hundred eighteen individuals were encompassed in the research. The radiological authenticity for indirect inguinal hernia remained varying from eighty-four to one hundred per cent. Likewise, it was ranging between seventy-one to eighty-six per cent in case of direct inguinal hernia. Two of the research works could preoperatively figure the clinical acumen in differentiating between two types of inguinal hernias- direct and indirect. Analysis of one hundred thirty-four examinations of right and left groins in sixty-seven patients was carried out by Ralphs D, Brain A, et al.[15] Likewise, Cameron AE et al.[16] observed inguinal hernias among one hundred eighty patients and deduced that the diagnostic authenticity stands ninety-two per 76% for indirect hernias, meanwhile, it remained

fifty-six per cent for direct inguinal hernia. One statistical research proposed the sensitivity and the specificity of clinical acumen in differentiating between direct and indirect inguinal hernia were 89.4% and 33.7%, showing a very weak specificity of clinical acumen, however the sensitivity is high. The overall prevalence of direct inguinal hernia was 64.3% among all the inguinal hernia.10 B M Kraft et al[17] in comparison to operative findings in surgical repair for inguinal hernias, combination of both the radiologic ultrasound and clinical acumen yield a diagnostic authenticity ranging from ninety-three to ninety-four per cent. Nonetheless, authenticity turned to be ranging from fifty-four to sixty-two per cent if the type of inguinal hernias was differentiated with the aid of the above-mentioned combined strategy. Moreover, the ultrasound and clinical evaluation could not aptly determine size of inguinal hernia. The data claims they could appreciate actual size in ranging from fifty to fifty-three per cent of cases. Nevertheless, it was research conducted by Robinson P et al.[18] who proposed that radiologic ultrasound is a comprehensive mode in detecting both inguinal and femoral hernias specifically among those cases who present with obvious clinical manifestation for them. The eighteen cases were operated for correcting hernia on sum of twenty-one groin regions. The statistics claim that hernias were appreciated among twenty regions, whereas in only one groin side there was weakened posterior wall of inguinal canal. In comparison to surgical correction the outcome of radio-imaging and hernia repair remained ninety-one per cent for the former and seventy-one per cent in the latter. In addition to it, other parameters, namely sensitivity, specificity, PPV, and NPV for the former remained ninety-five, one hundred, one hundred, and fifty per cent respectively. Likewise, the given parameters for the later reads as: seventy, one hundred, one hundred, and fourteen per cent respectively. To conclude, it is safely deduced that the sensitivity of radiologic ultrasound is greater as compared to that of surgical repair for hernia- McNemar test p=0.025. 78 Another study conducted by Jung-Man Namgoong et al. 66 concluded their findings that prior to surgery ultrasound is helpful for detecting inguinal hernia defect with the ensuing parameters: sensitivity in twenty and half per cent, specificity ninety-five per cent, PPV of seventy-five per cent, and NPV of sixty-two per cent. Overall its authenticity stands at sixty-four and half per cent. In short, one hundred seven cases were free of both recurrences of inguinal hernias and disease in opposite groin regions. As limited and dated literature is available on this topic, it is suggested that in future studies should be planned with larger sample size and with better methodology to evaluate the findings of our study. Small sample size was one of the limitations of this study. Another limitation of this study was that it was a single center study. So it is suggested that in future studies should be planned at multicenter setting to control the bias.

CONCLUSION

As per this study, one may conclude that clinical acumen has good diagnostic accuracy in differentiating indirect from direct inguinal hernia in adult population by keeping the surgery open inguinal hernia repair (tension-free with mesh/Lichtenstein or by reconstruction of the floor with tissue) as gold standard.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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AUTHORS' CONTRIBUTIONS:

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared

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