GEORGIAN MEDICAL NEWS

ISSN 1512-0112

NO 1 (358) Январь 2025

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

Monthly Georgia-US joint scientific journal published both in electronic and paper formats of the Agency of Medical Information of the Georgian Association of Business Press. Published since 1994. Distributed in NIS, EU and USA.

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

GEORGIAN MEDICAL NEWS
No 1 (359) 2025

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PREVALENCE, PATTERN, RISK FACTORS, AND MANAGEMENT OF ABDOMINAL AND INGUINAL HERNIAS IN KING FAHAD HOSPITAL AT AL-BAHA CITY, SAUDI ARABIA 2024

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Abstract.

Background: Abdominal hernia is common among genders and all ages. However, information about the prevalence and risk factors of abdominal hernia is still limited in Saudi Arabia. The aim of the study is to assess the Prevalence, Pattern, Risk Factors, and management of abdominal and inguinal hernias.

Method: This is an observational study set in King Fahad Hospital (KFH- Al-Baha) in the Al-Baha region of Saudi Arabia, with an inclusion of patients aged 18-80 years old who presented with abdominal or inguinal hernias between January 2022 and January 2024, excluding pediatric patients, patients above 80 & and patients with deficient data.

Results: The study included 219 patients, and the most reported type of hernia was indirect inguinal (37.9%). The most common risk factor was a history of previous abdominal surgery (26%), followed by comorbidities like diabetes mellitus (15%) and hypertension (13%). Seventeen percent suffered from hernia recurrence. Most of the hernia cases were reducible (96%). Strangulation features (pain and tenderness) were noted in 3.2% of patients. Ninety-two percent of the patients underwent elective surgical management, with open hernioplasty being the most common (42%). The analysis of hernia types in relation to demographic and clinical characteristics revealed that only gender was a significant finding. Males had significantly higher odds of developing indirect inguinal hernia (OR=35.7, 95% CI: 11.6–165, $p<0.001$) and direct inguinal hernia (OR=8.15, 95% CI: 2.27–52.2, $p=0.006$). Conversely, male gender was a protective factor against umbilical (OR=0.23, 95% CI: 0.09–0.58, $p=0.002$), paraumbilical (OR=0.13, 95% CI: 0.07–0.26, $p<0.001$), and incisional hernias (OR=0.30, 95% CI: 0.09–0.92, $p=0.040$).

Conclusion: The study concluded that the most common type of hernia was indirect inguinal hernia. Most of the patients underwent elective surgical management, with open hernioplasty being the most common.

Key words. Abdominal hernia, Inguinal, hernia, prevalence, Al-Baha Region, Saudi Arabia.

Introduction.

Abdominal wall hernias are one of the most common surgical conditions, regardless of age and gender. A hernia is defined as a protrusion of a peritoneal lined intestinal segment through a defect in the muscular layer of the abdomen [1]. It is characterized by a rupture in smooth tissue through which an organ protrudes or pushes through. It commonly occurs in the abdomen, groin regions, navel area and upper thigh. There are several types of hernia, out of which inguinal, hiatal, and umbilical hernias are the most common types, with the inguinal hernia being the most frequent (73%) [1-4].

Hernia becomes evident and symptomatic as a swelling in the groin, heavy feeling in the abdomen, and discomfort in the abdomen regions, especially when coughing, lifting, or bending over. However, in some individuals, symptoms may not appear and can only be recognized during regular medical checkups [2]. Hernias causes are related to muscle weakness and strain. Of these causes, chronic coughing, trauma to the abdominal wall and the inability of the wall of the abdomen to close properly are the most common causes of herniation [3].

Studies have assessed the prevalence of abdominal and inguinal hernias. For instance, a Saudi study conducted in Arar City reported the prevalence of abdominal hernias to be 11.7%, with paraumbilical hernias being the most common type, especially among females [5]. A study in Riyadh City reported a prevalence of abdominal hernia of 14.01% [6]. Another Saudi study reported a higher prevalence of 38.8% [7].

Globally, abdominal hernias have an estimated prevalence of 32.5 million cases, with variations in the prevalence of hernia subtypes, [8] of which are supported by an Indian study [9]. Another study emphasized that most patients presented with pain, followed by symptoms of irreducibility and vomiting [10]. Similarly, a study in Nigeria reported that most of the hernias were reducible, accompanied by abdominal pain and vomiting as a common complaint [11].

The risk factors for abdominal hernia include modifiable risk factors, such as pregnancy, obesity, smoking, weightlifting, constipation, and some chronic diseases (diabetes and asthma). Other nonmodifiable risk factors include older age, gender, and family history [12]. All these factors play a role in the weakness of the abdominal musculature or failure of abdominal defect closure.

Patients may often present with complications of hernia, such as irreducibility, obstruction, and strangulation, which is critically serious and leads to peritonitis. However, femoral hernia is more likely to obstruct and strangulate [13].

Strangulation occurs more often in large-size hernias protruding through small orifices. In such cases, the narrow neck of the hernia obstructs arterial blood flow, venous drainage, or both to the contents of the hernia sac. Furthermore, adhesions between the contents of the hernia sac and the peritoneal lining of the sac can entrap the hernia contents and eventually lead to intestinal obstruction and strangulation. These extremely painful strangulated hernias are considered a surgical emergency [14]. Hernia could be managed and treated surgically or non-surgically according to its severity.

Despite the availability of literature, there are significant gaps among individuals and health practitioners. Thus, this study was conducted to understand the prevalence, patterns of presentation, risk factors, and management of abdominal and inguinal hernias in Al-Baha City, Saudi Arabia.

Materials and Methods.

Study design and setting: This retrospective observational study was conducted in King Fahad Hospital at Al-Baha (KFH-Al-Baha) in the Al-Baha region of Saudi Arabia. Collecting data for patients who presented with an abdominal and inguinal hernia between January 2022 and January 2024 was gathered.

Inclusion criteria: All male or female patients aged 18 years old to 80 years old presented with ventral or inguinal hernias between January 2022 to January 2024 were included in the study.

Exclusion criteria: Pediatric patients (aged less than 18 years), patients above 80 & and patients with deficient data or those who present outside the time frame were excluded.

Data management and analysis: Data collection was done by the authors through a pre-defined data sheet designed by the authors and reviewed by experts in the field, data initially entered and cleaned using an Excel program, then analyzed using the SPSS program version 25. Data was presented as numbers and percentages and displayed as tables and figures. Pearson's Chi-squared and Fisher's exact tests were used to assess the correlation between sociodemographic characteristics and the type and presentation of hernia. Also, Logistic Regression Analysis was performed to analyze the Factors Influencing Hernia Development. A P value of <0.05 was considered significant.

Results.

Sociodemographic characteristics of participants:

Two hundred and nineteen (219) patients were included. The most common age category was 41-60 years (47%), followed by those aged 18-40 years (30%) and 61-80 years (23%). Most participants were males (64%), while 36% were females. Saudi patients comprised 89% of the participants, while 11% were non-Saudi, as illustrated in Table 1.

Risk factors of hernia:

Regarding the documented risk factors for hernia, the most common risk factor was a history of previous abdominal surgery (26%), followed by comorbidities like diabetes mellitus (15%) and hypertension (13%). Other risk factors included hypothyroidism (7.3%), chronic constipation (6.8%), and obesity (6.8%). However, 39% of the patients reported no risk factors, as shown in Table 1.

Clinical characteristics of hernia:

Eighty-three percent had no previous hernia recurrences, while (17%) suffered from a recurrence. Regarding hernia presentation, most cases were reducible (96%), while only 0.9% were irreducible or strangulated (3.2%), as shown in Table 2.

Considering symptoms and signs of hernia, 96% of patients presented with a mass without any accompanying symptoms. However, 0.5% suffered from symptoms of intestinal obstruction such as nausea or vomiting and similar low percentages for guarding and fever. Strangulation features, characterized by pain and tenderness, were noted in 3.2% of patients. Regarding management, 92% of the patients underwent elective surgical management, while 4.9% underwent emergency surgery. Open hernioplasty was the most common (42%), followed by laparoscopic hernioplasty (33%), as shown in Table 2.

Table 1. *Sociodemographic characteristics of patients (n=219).*

Characteristic	N = 219[1]
Age	
18 – 40	65 (30%)
41 – 60	104 (47%)
61- 80	50 (23%)
Gender	
Female	78 (36%)
Male	141 (64%)
Nationality	
None-Saudi	24 (11%)
Saudi	195 (89%)
Risk factors	
Diabetes mellitus	32 (15%)
Hypertension	28 (13%)
Chronic constipation	15 (6.8%)
Straining during urination	10 (4.6%)
Obesity	15 (6.8%)
Heavy lifting occupation	11 (5.0%)
Chronic coughing	10 (4.6%)
Previous abdominal surgery	56 (26%)
Hypothyroidism	16 (7.3%)
Grand multiparity	4 (1.8%)
No risk factors	86 (39%)
[1]n (%)	

Table 2. *Clinical characteristics of hernia among the patients (n=219).*

Characteristic	N = 219[1]
History of recurrence	
No	182 (83%)
Yes	37 (17%)
Presentation	
Irreducible	2 (0.9%)
Reducible	210 (96%)
Strangulated	7 (3.2%)
Symptoms and signs	
Mass without symptoms	211 (96%)
Intestinal obstruction features (nausea or vomiting)	1 (0.5%)
Guarding	1 (0.5%)
Fever	1 (0.5%)
Strangulation features (Pain)	7 (3.2%)
Tenderness	7 (3.2%)
Type of management	
Elective surgery	173 (95%)
Emergency surgery	9 (4.9%)
Unknown	37
Type of surgical management	
Laparoscopic Hernioplasty	72 (33%)
Laparoscopic Herniorrhaphy	1 (0.5%)
No surgical intervention	50 (23%)
Open Hernioplasty	91 (42%)
Open Herniorrhaphy	5 (2.3%)
[1]n (%)	

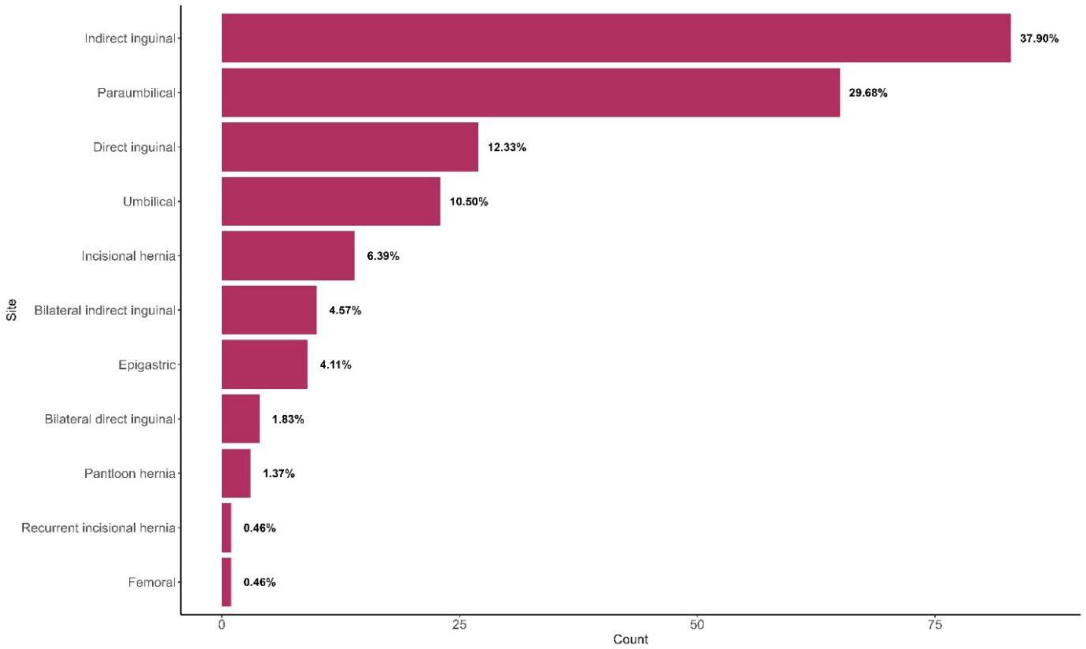

Figure 1. *Distribution of hernia types among the patients (n=219).*

Table 3. *Correlation between sociodemographic characteristics and types of hernia among the patients (n=219).*

	Indirect inguinal			**Direct inguinal**			**Umbilical**			**Paraumbilical**			**Femoral**	
Characteristic	**0**, N = 136[1]	**1**, N = 83[1]	**p-value**[2]	**0**, N = 192[1]	**1**, N = 27[1]	**p-value**[2]	**0**, N = 196[1]	**1**, N = 23[1]	**p-value**[2]	**0**, N = 154[1]	**1**, N = 65[1]	**p-value**[2]	**0**, N = 218[1]	**1**, N = 1[1]
Age			0.2			0.8			0.6			0.8		
18 - 40	38 (28%)	27 (33%)		57 (30%)	8 (30%)		56 (29%)	9 (39%)		47 (31%)	18 (28%)		64 (29%)	1 (100%)
41 - 60	71 (52%)	33 (40%)		90 (47%)	14 (52%)		94 (48%)	10 (43%)		71 (46%)	33 (51%)		104 (48%)	0 (0%)
61- 80	27 (20%)	23 (28%)		45 (23%)	5 (19%)		46 (23%)	4 (17%)		36 (23%)	14 (22%)		50 (23%)	0 (0%)
Gender			**<0.001**			**0.001**			**0.002**			**<0.001**		
Female	75 (55%)	3 (3.6%)		76 (40%)	2 (7.4%)		63 (32%)	15 (65%)		34 (22%)	44 (68%)		77 (35%)	1 (100%)
Male	61 (45%)	80 (96%)		116 (60%)	25 (93%)		133 (68%)	8 (35%)		120 (78%)	21 (32%)		141 (65%)	0 (0%)
Nationality			**<0.001**			0.2			0.085			0.051		
None Saudi	7 (5.1%)	17 (20%)		19 (9.9%)	5 (19%)		24 (12%)	0 (0%)		21 (14%)	3 (4.6%)		24 (11%)	0 (0%)
Saudi	129 (95%)	66 (80%)		173 (90%)	22 (81%)		172 (88%)	23 (100%)		133 (86%)	62 (95%)		194 (89%)	1 (100%)
History of recurrence			0.3			0.6			0.14			0.11		
No	110 (81%)	72 (87%)		158 (82%)	24 (89%)		160 (82%)	22 (96%)		132 (86%)	50 (77%)		181 (83%)	1 (100%)
Yes	26 (19%)	11 (13%)		34 (18%)	3 (11%)		36 (18%)	1 (4.3%)		22 (14%)	15 (23%)		37 (17%)	0 (0%)
presentation			0.5			0.7			>0.9			0.8		
Irreducible	1 (0.7%)	1 (1.2%)		2 (1.0%)	0 (0%)		2 (1.0%)	0 (0%)		1 (0.6%)	1 (1.5%)		2 (0.9%)	0 (0%)
Reducible	132 (97%)	78 (94%)		183 (95%)	27 (100%)		187 (95%)	23 (100%)		148 (96%)	62 (95%)		209 (96%)	1 (100%)
Strangulated	3 (2.2%)	4 (4.8%)		7 (3.6%)	0 (0%)		7 (3.6%)	0 (0%)		5 (3.2%)	2 (3.1%)		7 (3.2%)	0 (0%)

[1]*n (%)*
[2]*Pearson's Chi-squared test; Fisher's exact test*
[3]*Fisher's exact test.*

Regarding types of hernia, indirect inguinal hernia (37.9%), followed by paraumbilical (29.4%), direct inguinal (12.3%), umbilical (10.5%), and incisional hernia (6.3%). The least common was femoral hernia (0.4%), as illustrated in Figure 1.

Association testing showed that gender was significantly associated with the type of hernia (P< .001), except for the femoral hernia, which revealed no significant association with gender. Indirect inguinal, direct inguinal, and umbilical hernias were more predominant among males than females, while females exhibited a higher prevalence concerning paraumbilical hernias. Also, nationality was significantly associated with indirect inguinal hernia subtype, as it was noticed more frequently among Saudi participants than non-Saudi (P < .05), as illustrated in Table 3.

There is no significant correlation between age and recurrence of hernia or between sociodemographic characteristics and hernia presentation, as demonstrated in Tables 4 and 5.

The analysis of hernia types in relation to age, gender, nationality, history of recurrence, and presentation revealed that only gender was a significant finding. For Gender, males had significantly higher odds of developing indirect inguinal hernia (OR=35.7, 95% CI: 11.6–165, p<0.001) and direct inguinal hernia (OR=8.15, 95% CI: 2.27–52.2, p=0.006). Conversely, male gender was a protective factor against umbilical (OR=0.23, 95% CI: 0.09–0.58, p=0.002), paraumbilical (OR=0.13, 95% CI: 0.07–0.26, p<0.001), and incisional hernias (OR=0.30, 95% CI: 0.09–0.92, p=0.040).

Nationality did not show a significant association with any hernia type. Saudis had lower odds of indirect inguinal hernia (OR=0.41, 95% CI: 0.14–1.08, p=0.081) but with borderline significance. other variables were not significantly associated with type of hernia (p>0.05) Table 6.

Discussion.

Abdominal hernia can develop suddenly or over a long period due to several risk factors and causes. The incidence of abdominal and inguinal hernias varies between countries, from 100 – 300/100,000 annually [2]. In the USA, more than 750,000 hernias are reported annually [15].

Surgical management delays, particularly in resource-limited countries, worsen prognoses and complicated outcomes [16-18]. The current study assessed the risk factors and management of abdominal and inguinal hernias in the Al-Baha region of Saudi Arabia. The most common age was 41-60 years (47%). Males constituted 64%. It is important to consider the patient's age and gender when assuming a diagnosis of hernia since the age could give insights into the causes, whether it is due to vigorous exercise among young individuals or due to weak abdominal wall among females who underwent cesarean section. A previous Saudi study reported a prevalence of abdominal hernias of 11.7%, particularly among females [5]. Similarly, a Saudi study reported that most hernia cases appeared among elderly females over 51 years old [6].

Table 4. *Correlation between age and recurrence of hernia among the patients (n=219).*

	History of recurrence		
Characteristic	**No**, N = 182[1]	**Yes**, N = 37[1]	**p-value**[2]
Age			0.058
18 – 40	56 (31%)	9 (24%)	
41 – 60	90 (49%)	14 (38%)	
61- 80	36 (20%)	14 (38%)	

[1]n (%)
[2]Pearson's Chi-squared test

Table 5. *Correlation between sociodemographic characteristics and presentation of hernia among the patients (n=219).*

	Presentation			
Characteristic	**Irreducible**, N = 2[1]	**Reducible**, N = 210[1]	**Strangulated**, N = 7[1]	**p-value**[2]
Age				0.7
18 – 40	1 (50%)	63 (30%)	1 (14%)	
41 – 60	1 (50%)	100 (48%)	3 (43%)	
61- 80	0 (0%)	47 (22%)	3 (43%)	
Gender				0.9
Female	1 (50%)	74 (35%)	3 (43%)	
Male	1 (50%)	136 (65%)	4 (57%)	
Nationality				0.3
Non-Saudi	0 (0%)	22 (10%)	2 (29%)	
Saudi	2 (100%)	188 (90%)	5 (71%)	
History of recurrence				0.3
No	1 (50%)	174 (83%)	7 (100%)	
Yes	1 (50%)	36 (17%)	0 (0%)	

[1]n (%)
[2]Fisher's exact test.

Table 6. *Logistic Regression Analysis of Factors Influencing Hernia Development.*

	Indirect inguinal			Direct inguinal			Umbilical			Paraumbilical			Incisional		
Character-istic	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**	**OR[1]**	**95% CI[1]**	**p-value**
Age															
18 - 40	—	—		—	—		—	—		—	—		—	—	
41 - 60	0.71	0.33, 1.54	0.4	1.26	0.49, 3.43	0.6	0.56	0.20, 1.54	0.3	0.99	0.46, 2.14	>0.9	2.98	0.74, 20.0	0.2
61- 80	2.08	0.82, 5.51	0.13	0.95	0.26, 3.18	>0.9	0.53	0.13, 1.83	0.3	0.76	0.29, 1.93	0.6	1.14	0.13, 9.95	>0.9
Gender															
Female	—	—		—	—		—	—		—	—		—	—	
Male	35.7	11.6, 165	**<0.001**	8.15	2.27, 52.2	**0.006**	0.23	0.09, 0.58	**0.002**	0.13	0.07, 0.26	**<0.001**	0.30	0.09, 0.92	**0.040**
Nationality															
Non-Saudi	—	—		—	—					—	—				
Saudi	0.41	0.14, 1.08	0.081	0.85	0.29, 2.87	0.8				1.29	0.38, 5.96	0.7			
History of recurrence															
No	—	—		—	—		—	—		—	—		—	—	
Yes	0.46	0.18, 1.14	0.10	0.60	0.13, 1.94	0.4	0.20	0.01, 1.06	0.13	2.19	0.93, 5.16	0.072	1.49	0.31, 5.39	0.6
Presentation															
Irreducible	—	—								—	—				
Reducible	0.12	0.00, 9.26	0.4							0.66	0.02, 26.9	0.8			
Strangulated	0.44	0.00, 59.8	0.8							0.67	0.01, 40.3	0.8			

[1]*OR = Odds Ratio, CI = Confidence Interval.*
McFadden R square: Indirect inguinal: 0.291, direct inguinal: 0.089, umblicial: 0.100, paraumblicial: 0.167, Incisional hernia: 0.081.

Regarding types of hernia, the most common was indirect inguinal hernia (37.9%). This is compatible with the study conducted in the United Kingdom, where inguinal (70–75%), femoral (6–17%), and umbilical (3–8.5%) hernias were the most common types [19]. Another Pakistani study reported inguinal hernia (70%) as the most common type, followed by paraumbilical hernia (14.54%) [20]. Similarly, a survey in India revealed inguinal hernia as the most common type (21.8%) [21]. In contrast, a Saudi study indicated that the most common type of hernia was para-umbilical (33.9%), followed by inguinal (27.3%) [7]. An Ethiopian study reported epigastric hernias as the most common type (41.5%) [22]. This discrepancy in types of abdominal hernias could be attributed to study differences, community-based types, and associated factors.

The most common risk factor was a history of previous abdominal surgery (26%), followed by comorbidities like diabetes mellitus (15%) and hypertension (13%). This finding is supported by previous studies conducted in Saudi Arabia and Ethiopia [7,22]. It is evident from the literature that abdominal muscle weakness and loss of resistance to high intra-abdominal pressure can lead to herniation [23,24].

Seventeen percent suffered from hernia recurrences. Recurrence is the most serious concern following the surgical repair of hernia, as its management is more challenging and demanding [25]. Recurrence could be attributed to genetic factors, family history, or flaws in the implemented surgical technique or sutures [26,27].

Regarding the hernia presentation, most cases were reducible (96%), with 0.9% being irreducible or strangulated (3.2%). The risk of strangulation in developed countries is low (1.7% - 7%) [28,29]. However, in resource-limited areas, the risk increases to 68% [30-32]. This high incidence could be attributed to the delay in seeking medical care [33,34].

In terms of management, 92% of patients underwent elective surgical management, with open hernioplasty being the most common (42%). According to Jenkins and O'dwye, surgery is the best choice for managing abdominal hernia, including laparoscopic repair [35]. The majority of surgeons favored open mesh repair [36]. However, the best operational procedure should minimize the risk of complications and recurrence. It should provide rapid recovery with optimum cost-effectiveness.

Gender and nationality were significantly associated with the type of hernia, with males had a lower risk of indirect, direct inguinal, umbilical, para-umbilical, and incisional types, this finding is compatible with a previous Saudi study where male gender, age above 40, family history, and BMI were significant factors in relation to hernia pattern [7]. In contrast, another Saudi study found that previous abdominal trauma and grand multipara are significantly associated with hernia subtypes [5]. These factors collectively play a fundamental role in abdominal wall weakness, rendering the individual vulnerable to hernia. Additionally, indirect inguinal hernia was significantly more common in Saudi participants, which can be attributed to the different genetic and environmental factors, On the other hand

another Saudi study showed no difference in the prevalence of abdominal hernia between Saudi and Non-Saudi population [7].

Overall, this study provides a valuable understanding of the pattern of hernia presentation, its types, risk factors and management. A limited number of Saudi studies were published in this scope; hence, this study is considered a valuable base for evidence. Another strength of this study is that it included participants from variable demographic backgrounds and socio-economic status, which would aid the authorities in dealing with the issue from all aspects. Furthermore, this study is a basis for further studies in this aspect. The study was not without limitations. The single setting may have determined a highly selected group of cases, which limits the generalization of the findings. Larger numbers of respondents would have improved the statistical significance of the results. Also, the retrospective design might have led to underreporting of morbidity, we recommend further studies to perform a prospective design to expand the spectrum and to include numerous healthcare institutions.

Conclusion.

The study concluded that the most common type of hernia among the patients was indirect inguinal hernia. Most of the patients underwent elective surgical management, with open hernioplasty being the most common. Serial studies should be conducted and funded to generate more evidence. Medical missions, educational campaigns and workshops should be held to prevent and control the severity of abdominal and inguinal hernias.

Statements of Declarations.

Ethics approval and consent to participate: Ethical approval was obtained from the Institutional Review Board (IRB) – Ministry of Health, Saudi Arabia. The participants were assured of the confidentiality and anonymity of their information. No financial benefit was offered to participants.

Consent to participate: An informed consent was obtained to collect data from patients' records.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request. The data is not publicly available due to issues of privacy.

Competing interest: Authors declare no competing interests.

Funding: This study received no funding.

REFERENCES

1. Rains AJH, Capper WM. Bailey & Love's Short Practice of Surgery. 15th ed. London: Lewis; 1971.
2. Kingnorth A, LeBlanc KA. Management of abdominal hernias. 3rd Edition. London: Edward Arnold; 2003.
3. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. Lancet. 2003;362:1561-1571.
4. Townsend C, Beauchamp D, Evers M, et al. Sabiston Textbook of Surgery: The biological basis of modern surgical practice. Philadelphia, PA: WB Saunders; 2001.
5. AhmedAlenazi A, Alsharif MM, Hussain MA, et al. Prevalence, risk factors and character of abdominal hernia in Arar City, Northern Saudi Arabia in 2017. Electron Physician. 2017;9:4806-4811.
6. Alsoghair A, Alhussain S, Almogheer R, et al. Awareness, prevalence, and risk factors of hernia in Riyadh, Saudi Arabia. Int J Med Dev Countries. 2023;7:1790-1795.
7. Mahfouz MEM, Al-Juaid RS. Prevalence and risk factors of abdominal hernia among Saudi population. J Family Med Prim Care. 2021;10:3130-3136.
8. Ma Q, Jing W, Liu X, et al. The global, regional, and national burden and its trends of inguinal, femoral, and abdominal hernia from 1990 to 2019: findings from the 2019 Global Burden of Disease Study - a cross-sectional study. Int J Surg. 2023;109:333-342.
9. Pandya B, Huda T, Gupta D, et al. Abdominal Wall Hernias: An Epidemiological Profile and Surgical Experience from a Rural Medical College in Central India. Surg J (N Y). 2021;7:e41-e46.
10. Davies M, Davies C, Morris-Stiff G, et al. Emergency presentation of abdominal hernias: outcome and reasons for delay in treatment - a prospective study. Ann R Coll Surg Engl. 2007;89:47-50.
11. Udo IA. Clinical Presentation of Inguinal Hernia among Adults in Uyo, Nigeria. Niger J Clin Pract. 2021;24:1082-1085.
12. Alkhars AA, Albakheit HA, Al-Anazi FA. Awareness of risk factors of hernia among adults in Riyadh, KSA. Egypt J Hosp Med. 2018;71:2780-7.
13. Assakran B, Alharbi M, Alnikaiden G, et al. Awareness of hernia risk factors among adults in Al-Qassim, Saudi Arabia. Int J Med Dev Countries. 2020;4:1662-7.
14. Alsaigh S, Alotaibi S, Aljasser R, et al. Measurement of knowledge and practice of Saudi population towards hernias and its risk factors. Cureus. 2023;15:e33264.
15. Rutkow IM. Demographic and socioeconomic aspects of hernia repair in the United States in 2003. Surg Clin North Am. 2003;83:1045-51.
16. Shi H, Clegg DJ. Sex differences in the regulation of body weight. Physiol Behav. 2009;97:199-204.
17. Bedewi MA, El-Sharkawy MS, Al Boukai AA, et al. Prevalence of adult paraumbilical hernia. Assessment by high-resolution sonography: a hospital-based study. Hernia. 2012;16:59-62.
18. Sangwan M, Sangwan V, Garg M, et al. Abdominal wall hernia in a rural population in India spectrum changing? Open J Epidemiol. 2013;3:135-8.
19. Dabbas N, Adams K, Pearson K, et al. Frequency of abdominal wall hernias: is classical teaching out of date? JRSM Short Rep. 2011;2:1-6.
20. Iqbal MN, Akhter S, Irfan M. Prevalence of hernia about various risk factors in Narowal. Pakistan. Sci Lett. 2015;3:29-32.
21. Rao G, Rao A, Pujara N, et al. Prevalence of Hernia Among Fishermen Population In Kutch District, India. Natl J Integr Res Med. 2015;6:44-51.
22. Kibret AA, Tekle SY, H/Mariam MM, et al. Prevalence and associated factors of external hernia among adult patients visiting the surgical outpatient department at the University of Gondar Comprehensive Specialised Hospital, Northwest Ethiopia: a cross-sectional study. BMJ Open. 2022;12:e056488.
23. Lauscher JC, Loh JC, Rieck S, et al. Long-term follow-up after incisional hernia repair: are there only benefits for symptomatic patients? Hernia. 2012;17:203-9.

24. van der Rest M, Garrone R. Collagen family of proteins. Faseb J. 1991;5:2814-23.
25. Siddaiah-Subramanya M, Ashrafi D, Memon B, et al. Causes of recurrence in laparoscopic inguinal hernia repair. Hernia. 2018;22:975-986.
26. Burcharth J, Pommergaard HC, Bisgaard T, et al. Patient-related risk factors for recurrence after inguinal hernia repair: a systematic review and meta-analysis of observational studies. Surg Innov. 2015;22:303-317.
27. Targarona EM. Endorsement of the HerniaSurge guidelines by the European Association of Endoscopic Surgery. Hernia. 2018;22:181.
28. Chistina N, Candrawinata V, Nathalia C, et al. The operative duration of elective and emergency hernia repair surgery: a single center experience. Bali Med J. 2023;12:704-6.
29. Köckerling F, Heine T, Adolf D, et al. Trends in Emergent Groin Hernia repair—an analysis from the Herniamed registry. Front Surg. 2021;8:655-755.
30. Lebeau R, Traoré M, Anzoua KI, et al. Prognostic factors of postoperative morbidity and mortality of adult strangulated Groin Hernia. Indian J Surg. 2016;78:192-6.
31. Sakiye KA, Kanassoua K, Kassegne I, et al. Prise en charge des hernies étranglées de l'aine en milieu chirurgical rural. J Rech Sci. 2014;16:433-40.
32. Osei-Boakye F, Wiafe YA, Nkansah C, et al. hematological profile in pre-surgery hernia patients. Sci Med J. 2022;4:1-12.
33. Ndong A, Tendeng JN, Diallo AC, et al. Adult groin hernia surgery in sub-Saharan Africa: a 20-year systematic review and meta-analysis. Hernia. 2023;27:157-172.
34. Adamou H, Amadou MI, Halidou M, et al. Prise en charge des hernies de l'aine à l'hôpital national de Zinder. Annales de l'Université Abdou Moumouni Tome XXII-A. 2017;22:102-110.
35. Jenkins JT, O'dwyer PJ. Inguinal hernias. BMJ. 2008;336:269-272.
36. Bailey M. Controversial topics in surgery. The case for laparoscopic repair. Ann R Coll Surg Engl. 2005;87:57-60.