ACUTE APPENDICITIS

Haydarov Navro'zbek Furqat o'g'li
Asian International University, Bukhara, Uzbekistan

https://doi.org/10.5281/zenodo.14864171

Abstract. *Acute appendicitis is the most common reason for abdominal surgery. Luminal obstruction of the appendix progresses to suppurative inflammation and perforation, which causes generalised peritonitis or an appendix mass/abscess. Classical features include periumbilical pain that migrates to the right iliac fossa, anorexia, fever, and tenderness and guarding in the right iliac fossa. Atypical presentations are particularly common in preschool children. A clinical diagnosis is possible in most cases, after a period of active observation if necessary; inflammatory markers and an ultrasound scan are useful investigations when the diagnosis is uncertain.*

Treatment is by appendicectomy after appropriate fluid resuscitation, analgesia and intravenous antibiotics. Laparoscopic appendicectomy is better than open appendicectomy in most cases because it is associated with less postoperative pain and a shorter hospital stay, but recovery after acute appendicitis is mostly dictated by whether the appendix was perforated or not.

Management of the appendix mass remains controversial and not all affected children need an interval appendicectomy. This article discusses tips and pitfalls in diagnosis and addresses many of the controversies that surround the management of this condition.

Key words: *abdominal pain; appendix; laparoscopic appendicectomy; surgery.*

ОСТРЫЙ АППЕНДИЦИТ

Аннотация. *Острый аппендицит является наиболее частой причиной абдоминальной хирургии. Обструкция просвета аппендикса прогрессирует до гнойного воспаления и перфорации, что вызывает генерализованный перитонит или массу аппендикса/абсцесс. Классические признаки включают боль в области пупка, которая мигрирует в правую подвздошную ямку, анорексию, лихорадку, болезненность и напряжение в правой подвздошной ямке. Атипичные проявления особенно распространены у детей дошкольного возраста. Клинический диагноз возможен в большинстве случаев после периода активного наблюдения, если необходимо; маркеры воспаления и ультразвуковое сканирование являются полезными исследованиями, когда диагноз неясен.*

Лечение заключается в аппендэктомии после соответствующей инфузионной терапии, анальгезии и внутривенных антибиотиков. Лапароскопическая аппендэктомия лучше открытой аппендэктомии в большинстве случаев, поскольку она связана с меньшей послеоперационной болью и более коротким пребыванием в больнице, но восстановление после острого аппендицита в основном диктуется тем, был ли аппендикс перфорирован или нет. Лечение аппендикса остается спорным, и не всем пострадавшим детям

требуется интервальная аппендэктомия. В этой статье обсуждаются советы и подводные камни в диагностике и рассматриваются многие противоречия, которые окружают лечение этого состояния.

Ключевые слова: *боль в животе; аппендикс; лапароскопическая аппендэктомия; хирургия.*

Etiology

Luminal obstruction from mucosal inflammation, lymphoid hyperplasia or faecolith causes appendiceal distension and inflammation, which progresses to suppurative transmural inflammation, ischaemia, infarction and perforation. Minor episodes of mucosal inflammation can probably resolve spontaneously and may account for reports of prior self-limiting episodes of similar pain in some patients with acute appendicitis. The inflamed appendix may become walled off by omentum and surrounding viscera to form an inflammatory mass. The incidence of macroscopic appendiceal perforation is variable but is around 25–35% in large series. Appendiceal perforation progresses to generalised peritonitis or a localised walled off collection of pus. A faecolith is found in about 28% of children with acute appendicitis. Common bacterial isolates in perforated appendicitis include Bacteroides fragilis, Escherichia coli, Pseudomonas aeruginosa, Peptostreptococcus species and Fusobacteria. Pinworms are found in a small but variable proportion of appendicectomy specimens removed for suspected acute appendicitis, and there is debate about whether these worms actually cause acute appendicitis. Since pinworms are most often seen in non-inflamed appendices, the general perception is that they very rarely cause appendicitis but may sometimes cause abdominal pain mimicking acute appendicitis. Twin studies suggest that there may be a small genetic predisposition to acute appendicitis, and a positive family history is often elicited

Presentation

Most diagnoses are made based upon the history, clinical examination and laboratory tests.

In all cases there is no value in with holding analgesia for fear of concealing symptoms.

Active monitoring is a useful strategy in systemically well patients with equivocal symptoms, serial examinations and blood tests performed over a 24e 48 hour period significantly improves sensitivity. Imaging is mostly performed when there is diagnostic uncertainty and widely employed in children, young women and older adults. Particular vigilance is needed in high-risk groups, extremes of age, immunocompromised, morbidly obese, diabetic and pregnant patients.

These groups are more likely to present with subtle and atypical signs in the presence of complex appendicitis. Diagnostic laparoscopy is an option usually reserved where symptoms persist in patients considered low risk for surgery.

It has the advantage of high sensitivity and specificity, particularly in young women and diagnoses such as endometriosis, pelvic inflammatory disease and adhesions. The history, examination and further tests are focused on discriminating between the likely differentials.

Presenting history

The primary symptom is abdominal pain, the classical history one of vague peri-umbilical pain migrating to the right iliac fossa in the first 24 hours. Pain exacerbated on coughing and moving may indicate some degree of peritonism. Patients often describe anorexia, nausea, vomiting and less frequently constipation or diarrhoea. Low-grade pyrexia is common, less so a high grade pyrexia (>39C) or rigors. The history should establish the duration, pattern and characteristics of pain and associated symptoms. Normal bowel habits should be explored and any change, such as diarrhoea, constipation, mucous and rectal bleeding. Night sweats, weight loss, lethargy and other systemic signs are also particularly helpful in distinguishing between a discrete acute episode and a chronic or recurring process. Lower urinary tract symptoms, menstrual and sexual history assists in finding a genitourinary or gynaecological cause for the pain although an inflamed pelvic, subcaecal and post-ileal appendix may cause pelvic, groinor testicular pain and urinary symptoms. In children further questions around peri-natal history, immunization status and recent viral or bacterial illnesses are relevant.

Physical examination

Patients with appendicitis are classically flushed, dehydrated, sometimes ketotic and prefer to remain still. Physiological parameters may show a low-grade fever with tachycardia. Abdominal tenderness in the right iliac fossa and evidence of localised peritonism such as involuntary guarding, rebound tenderness and percussion tenderness are indicative of appendicitis. Other means of testing for peritonism in children include blowing out and sucking in the abdomen or hopping by the bed. In slim patients the appendix or an associated appendiceal mass may be palpable. A number of eponymous tests exist. Testicular examination is essential in young males to look for testicular torsion. Pelvic and rectal examinations are not routinely performed unless there is a suspicion of an alternative diagnosis warranting examination. Ear, nose and throat examination should be performed in younger children; concurrent or recent upper respiratory tract infection and lymphadenopathy may suggest mesenteric adenitis. Presentation with a ‘rigid abdomen’, diffuse abdominal guarding, indicates generalized peritonitis and a perforated gastrointestinal tract. It may be associated with sepsis and shock necessitating immediate resuscitation. A history of preceding right iliac fossa may raise the suspicion of a perforated appendix. Other non-perforated causes of generalized peritonitis include pancreatitis, pelvic inflammatory disease and spontaneous bacterial peritonitis

Other tests

Laboratory

A rise in inflammatory markers, both white blood count (pre dominantly neutrophilia) and CRP, are sensitive for appendicitis but not specific. The rise in inflammatory markers is not immediate and patients particularly with a short duration of symptoms can have normal blood tests. Sequential blood tests over a 24 hour period, provides better diagnostic sensitivity.

Imaging

X-rays are typically done to exclude other differential diagnoses, a chest X-ray may also be performed to look for free subdiaphragmatic gas in a patient with upper abdominal peritonitis.

An abdominal X-ray may show an appendicular faecolith but has poor sensitivity and specificity. Women and children with equivocal symptoms often undergo abdominal ultrasound, which has reasonable sensitivity for appendicitis and useful for detecting tubo-ovarian and biliary disease. The limitations of

Ultrasound include operator dependence, abdominal pain restricting the examination and views impaired by obesity and overlying bowel gas. CT is highly sensitive and specific for appendicitis, up to 96%, but is disadvantaged by its dose of ionizing radiation. It is widely used in older adults where appendicitis is less common and alternative diagnoses such as malignancy, right-sided diverticulitis or ischaemic colitis should be considered and requires different treatment.

Obese and immunocompromised patients and those with inflammatory bowel disease are also groups where CT is often considered. MRI although a lower dose of radiation and being accurate in diagnosing appendicitis is rarely used. Patients may not tolerate the longer duration of scan and enclosed space, it is a more costly imaging modality and there is often limited accessibility

Management

Patients with suspected appendicitis should be admitted and managed with analgesia, anti-sickness, intravenous fluids and broad-spectrum antibiotics as indicated. Antibiotics are given just prior to surgery or immediately in the event of delays to theatre or sepsis. Concern over Clostridium difficile infection and antibiotic resistance has led to increasingly restricted use of cephalosporins; the combination of amoxicillin, metronidazole and gentamicin is an alternative strategy. Perioperative care should involve regular review of the appropriate level of care, fluid status, infection and antibiotics, comorbidities and regular medications and thromboprophylaxis.

The minimization of indwelling catheters, early mobilization and nutrition may also improve outcomes. In simple appendicitis antibiotics are not required following appendicectomy and the patient may go home the same day if well recovered. If there is significant intra-abdominal contamination antibiotics are usually continued intravenously for at least 48 hours and a 5-day course completed.

If the appendix appears normal intraoperatively most surgeons will remove it if no other cause for the right iliac fossa pain is found; 32% of macroscopically normal looking appendixes show signs of inflammation on histopathological examination.

This is not a universal strategy. A negative appendicectomy is associated with a complication rate of around 15%. It is not a completely benign procedure and with limited evidence decision-making tends to be at the surgeon's discretion. A non-operative strategy with antibiotics is favourable in some cases. It is most frequently considered in patients without generalized peritonitis or sepsis who have a significant operative risk, appendicular mass or active inflammatory bowel disease. Immediate surgery in these groups is associated with increased morbidity and potentially avoidable ileocaecal resection.

Procedure

Laparoscopic appendicectomy is now more common than an open approach. It is a better diagnostic procedure and other advantages include earlier return to work and fewer surgical site infections. The open appendicectomy is safe and remains widely used, particularly in small children, pregnancy, patients with severe cardiorespiratory disease unable to tolerate the pneumoperitoneum or patients with multi plepreviousSur geries where port access may be risky due to adhesion stethering bowel to the abdominal wall. Experimental approaches to the appendicectomy includes ingle incision laparoscopic appendicectomy (SILA) and natural orificetransluminal endoscopicsurgery (NOTES) performed by trans-vaginal or trans-gastric routes but neither have demon strated superiority so far and involve increased complexity.

Laparoscopic appendectomy

The patient is prepared supine, the surgeon and assistant typically stand on the left side of the patient with the stack including the screen on the opposite side. Ports are commonly placed using the Hassan technique, emptying the bladder reduces the risk of injury during placement. A supra- or infra-umbilical incision is made and the umbilical stalk traced down to the fascia (linea alba). At the stalk fascial junction the peritoneum is tethered, a superficial incision is made and a blunt instrument is gently pushed through the peritoneum. A 10 mm port is inserted and the pneumoperitoneum is established at 12 mmHg. Additional ports are introduced; a common approach is 5 mm ports supra pubically and in the left iliac fossa allowing triangulation of the instruments to manipulate the appendix. They are placed under direct vision to avoid injury to the viscera and epigastric vessels. Examination of the abdominal cavity is performed to confirm the diagnosis. The appendix is then mobilized and manipulated with an atraumatic grasper, tilting the table head and left side down can assist in removing small bowel from the right iliac fossa isolating the appendix. Dissection of the mesoappendix from the appendix is performed using diathermy, vessels particularly the appendicular artery can be cauterized or clipped when encountered.

When the mesoappendix is dissected off at the base of the appendix an endoloop is placed over the tip and tightened at the appendix base. A second is positioned just above the first, allowing enough space between the loops to divide the appendix; alternatively stapling devices can be used.

To limit contamination, the appendix is placed in a retrieval bag prior to removal through the umbilical 10 mm port and washout performed if there is contamination. Intraperitoneal gas should be allowed to escape from the abdomen as it contributes to shoulder tip pain on emergence from anaesthetic.

At the um bilicus the fascia is usually closed with a J-stitch to reduce the risk of port site hernias prior to skin closure.

Outcomes

Postoperative complications occur in approximately 13% of cases. Surgical site infection is the most common complication, occurring in approximately 3.8% of appendicectomies.

Increasing abdominal or pelvic pain, intermittent pyrexia and diarrhoea should raise suspicion of an intra-abdominal abscess, occurring in 4% of appendicectomies. Ultrasound or CT scans are used to detect postoperative collections and they are most frequently found in the pelvis or subphrenic space. Depending on size and location they may be treated with intravenous antibiotics alone or in combination with percutaneous drainage under radiological guidance or surgical drainage. Less frequent complications include bleeding, ileus, iatrogenic bowel or bladder injury, incisional or port site hernias and adhesions causing small bowel obstruction. Rare complications include stump appendicitis, the inflammation of a long residual appendicular stump that has been left in situ following appen dicectomy. Another is a faecal fistula, it occurs when the stump reopens resulting in the leakage of faecal material which dis charges through the wound.

Most faecal fistulae will resolve with non-operative management.

Conclusion

The classic case is an adolescent or young adult diagnosed based on a typical history, examination and laboratory findings. The mainstay of treatment is either laparoscopic or open appendicectomy. In reality appendicitis can be a challenge to diagnose and manage. Appreciating this and maintaining a level of suspicion is crucial, particularly for those atypical groups at risk of poor outcomes.

REFERENCES

1. Saodat, A., Vohid, A., Ravshan, N., & Shamshod, A. (2020). MRI study in patients with idiopathic cokearthrosis of the hip joint. *International Journal of Psychosocial Rehabilitation*, *24*(2), 410-415.

2. Axmedov, S. J. (2023). EFFECTS OF THE DRUG MILDRONATE. *Innovative Development in Educational Activities*, *2*(20), 40-59.
3. Jamshidovich, A. S. (2023). ASCORBIC ACID: ITS ROLE IN IMMUNE SYSTEM, CHRONIC INFLAMMATION DISEASES AND ON THE ANTIOXIDANT EFFECTS. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *3*(11), 57-60.
4. Jamshidovich, A. S. (2023). THE ROLE OF THIOTRIAZOLINE IN THE ORGANISM. *Ta'lim innovatsiyasi va integratsiyasi*, *9*(5), 152-155.
5. Jamshidovich, A. S. (2023). HEPTRAL IS USED IN LIVER DISEASES. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *35*(3), 76-78.
6. Jamshidovich, A. S. (2023). EFFECT OF TIVORTIN ON CARDIOMYOCYTE CELLS AND ITS ROLE IN MYOCARDIAL INFARCTION. *Gospodarka i Innowacje.*, *42*, 255-257.
7. Jamshidovich, A. S. (2024). NEUROPROTECTIVE EFFECT OF CITICOLINE. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *4*(1), 1-4.
8. Jamshidovich, A. S. (2024). THE ROLE OF TRIMETAZIDINE IN ISCHEMIC CARDIOMYOPATHY. *Journal of new century innovations*, *44*(2), 3-8.
9. Jamshidovich, A. S. (2024). ВСЕ ЭФФЕКТЫ ПРЕПАРАТА ИМУДОН. *TADQIQOTLAR*, *31*(2), 39-43.
10. Jamshidovich, A. S. (2024). SPECIFIC FEATURES OF THE EFFECT OF THE HEPARIN DRUG. *TADQIQOTLAR*, *31*(2), 34-38.
11. Jamshidovich, A. S. (2024). USE OF GLUCOCORTICOSTEROIDS IN PEDIATRIC PRACTICE. *TADQIQOTLAR*, *31*(2), 29-33.
12. Jamshidovich, A. S. (2024). РОЛЬ ИНТЕЛЛАНОВОГО СИРОПА И ЦИАНОКОБАЛАМИНА В УЛУЧШЕНИИ ПАМЯТИ. *TADQIQOTLAR*, *31*(2), 44-48.
13. Jamshidovich, A. S. (2024). TREATMENT OF POLYNEUROPATHY WITH BERLITHION. *Ta'limning zamonaviy transformatsiyasi*, *4*(1), 201-209.
14. Jamshidovich, A. S. (2024). USE OF ASCORIL IN BRONCHIAL ASTHMA. *Ta'limning zamonaviy transformatsiyasi*, *4*(1), 191-200.
15. Jamshidovich, A. S. (2024). THE IMPORTANCE OF THE DRUG ARTOXAN. *Ta'limning zamonaviy transformatsiyasi*, *4*(1), 182-190.
16. Jamshidovich, A. S. (2024). THE ROLE OF RENGALIN IN CHRONIC BRONCHITIS. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(4), 116-123.

17. Jamshidovich, A. S. (2024). THE ROLE OF ALMAGEL DRUG IN GASTRIC AND DUODENAL WOUND DISEASE. *Ta'limning zamonaviy transformatsiyasi*, *4*(1), 173-181.
18. Jamshidovich, A. S. (2024). THE ROLE OF CODELAK BRONCHO SYRUP IN CHILDREN'S PRACTICE. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(4), 109-115.
19. Jamshidovich, A. S. (2024). THE AEVIT DRUG EFFECT. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(4), 124-132.
20. Jamshidovich, A. S. (2024). THE IMPORTANCE OF ALCHEBA DRUG IN POST-STROKE APHASIA. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(4), 132-138.
21. Jamshidovich, A. S. (2024). THE ROLE OF HYALURON CHONDRO DRUG IN OSTEOARTHROSIS. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(4), 139-145.
22. Jamshidovich, A. S. (2024). EFFECT OF SIMETHICONE DROP IN FLATULENCE. *Лучшие интеллектуальные исследования*, *14*(1), 95-101.
23. Jamshidovich, A. S. (2024). BENEFITS OF BETADINE SOLUTION. *Лучшие интеллектуальные исследования*, *14*(1), 116-122.
24. Jamshidovich, A. S. (2024). EFFECT INHALED GLUCOCORTICOIDS IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND BRONCHIAL ASTHMA. *TADQIQOTLAR*, *31*(1), 171-180.
25. Jamshidovich, A. S. (2024). USE OF VIGANTOL IN RICKETS. *Лучшие интеллектуальные исследования*, *14*(1), 102-108.
26. Jamshidovich, A. S. (2024). THE VITAPROST DRUG RESULTS. *Лучшие интеллектуальные исследования*, *14*(1), 109-115.
27. Jamshidovich, A. S. (2024). THE ROLE OF BISEPTOL DRUG IN URINARY TRACT DISEASE. *Лучшие интеллектуальные исследования*, *14*(1), 89-94.
28. Jamshidovich, A. S. (2024). PROPERTIES OF THE DRUG DORMIKIND. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(5), 88-92.
29. Jamshidovich, A. S., & Komilovich, E. B. (2024). IMMUNOMODULATORY FUNCTION OF DIBAZOL DRUG. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(5), 83-87.
30. Jamshidovich, A. S., & Komilovich, E. B. (2024). ADVANTAGES OF THE DRUG HEPTRAL. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(5), 98-101.

31. Эргашов, Б. К., & Ахмедов, Ш. Ж. (2024). ГИПЕРТОНИЧЕСКАЯ БОЛЕЗНЬ ЭТИОЛОГИЯ. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 59-69.
32. Komilovich, E. B., & Jamshidovich, A. S. (2024). HYPERTENSION, CLASSIFICATION AND PATHOGENESIS. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 50-58.
33. Komilovich, E. B., & Jamshidovich, A. S. (2024). YURAK ISHEMIYASI. STENOKARDIYADA SHOSHILINCH TIBBIY YORDAM. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 12-20.
34. Komilovich, E. B., & Jamshidovich, A. S. (2024). HYPERTENSION ETIOLOGY. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 32-41.
35. Komilovich, E. B., & Jamshidovich, A. S. (2024). CARDIAC ISCHEMIA. ANGINA NURSING DIAGNOSIS AND CARE. *Journal of new century innovations*, *46*(1), 44-52.
36. Jamshidovich, A. S. (2024). IMPORTANT INDICATIONS OF THE DRUG WOBENZYM. *Journal of new century innovations*, *46*(1), 29-32.
37. Jamshidovich, A. S. (2024). THE RESULTS OF THE EFFECT OF THE DRUG VALIDOL. *Journal of new century innovations*, *46*(1), 19-23.
38. Jamshidovich, A. S. (2024). VIFERON USE IN CHILDREN. *Journal of new century innovations*, *46*(1), 24-28.
39. Jamshidovich, A. S. (2024). USE OF DUSPATALIN (MEBEVERINE HYDROCHLORIDE) IN GASTROINTESTINAL DISEASES. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(5), 93-97.
40. Jamshidovich, A. S. (2024). ЭФФЕКТЫ СИРОПА ДЕПАКИНА (ВАЛЬПРОЕВАЯ КИСЛОТА). *Ta'lim innovatsiyasi va integratsiyasi*, *14*(2), 148-152.
41. Jamshidovich, A. S., & Komilovich, E. B. (2024). THE IMPORTANCE OF THE DRUG ALLOCHOL FOR CHRONIC CHOLECYSTITIS. *Ta'lim innovatsiyasi va integratsiyasi*, *14*(2), 133-137.
42. Jamshidovich, A. S., & Komilovich, E. B. (2024). ВАЖНЫЕ СВОЙСТВА ПРЕПАРАТА ДЕ-НОЛ (субцитрат висмута). *Ta'lim innovatsiyasi va integratsiyasi*, *14*(2), 143-147.
43. Jamshidovich, A. S., & Komilovich, E. B. (2024). SPECIAL FEATURES OF BUDECTON DRUG. *Ta'lim innovatsiyasi va integratsiyasi*, *14*(2), 138-142.
44. Jamshidovich, A. S. (2024). ЭФФЕКТИВНОЕ ВОЗДЕЙСТВИЕ ПРЕПАРАТА КЕЙВЕР. *Ta'lim innovatsiyasi va integratsiyasi*, *15*(3), 137-143.

45. Jamshidovich, A. S. (2024). USEFUL PROPERTIES OF THE DRUG YODOFOL. *Ta'lim innovatsiyasi va integratsiyasi*, *15*(3), 144-149.
46. Jamshidovich, A. S. (2024). FITOTERAPIYANING AKUSHER-GINEKOLOGIYADA AHAMIYATI. *Лучшие интеллектуальные исследования*, *15*(2), 121-125.
47. Jamshidovich, A. S. (2024). THE IMPORTANCE OF THE DRUG DOPROKIN. *Лучшие интеллектуальные исследования*, *15*(2), 109-114.
48. Jamshidovich, A. S. (2024). THE EFFECT OF DOSTINEX ON THE BODY. *Лучшие интеллектуальные исследования*, *15*(2), 115-120.
49. Jamshidovich, A. S. (2024). РЕЗУЛЬТАТЫ ЭФФЕКТИВНОГО ДЕЙСТВИЯ ПРЕПАРАТА КАНЕФРОН. *Лучшие интеллектуальные исследования*, *15*(2), 138-143.
50. Jamshidovich, A. S. (2024). СОВРЕМЕННЫЕ ЭФФЕКТЫ ПРЕПАРАТА ИНДОЛ. *Лучшие интеллектуальные исследования*, *15*(2), 126-131.
51. Jamshidovich, A. S. (2024). EFFECT OF ISMIZHEN DRUG ON BODY IMMUNITY. *Лучшие интеллектуальные исследования*, *15*(2), 132-137.
52. Jamshidovich, A. S. (2024). POSITIVE EFFECTS OF THE DRUG CARCIL. *Ta'lim innovatsiyasi va integratsiyasi*, *15*(3), 127-131.
53. Jamshidovich, A. S. (2024). РЕЗУЛЬТАТЫ ЭФФЕКТИВНОГО ДЕЙСТВИЯ КАВИНТОНА. *Ta'lim innovatsiyasi va integratsiyasi*, *15*(3), 132-136.
54. Jamshidovich, A. S. (2024). Современный Эффект Спрея Мометазон. *Research Journal of Trauma and Disability Studies*, *3*(3), 62-65.
55. Jamshidovich, A. S. (2024). THE ROLE OF" SIMONTE PLUS" DRUG IN THE MODERN TREATMENT OF BRONCHIAL ASTHMA. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *4*(5), 66-70.
56. Jamshidovich, A. S. (2024). FEATURES OF THE BIOMECHANISM OF THE DRUG LEVOMYCETIN (CHLORAMPHENICOL). *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *4*(9), 298-301.
57. Jamshidovich, A. S. (2024). THE MOST IMPORTANT INDICATORS OF OMEGA 3 SUBSTANCE IN THE METABOLISM OF THE HUMAN BODY. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *4*(10), 113-117.
58. Komilovich, E. B., & Khalimovich, M. N. (2024). CARDIAC ISCHEMIA. ANGINA CLINICAL FORMS AND DIAGNOSIS. *Journal of new century innovations*, *46*(1), 70-78.
59. Komilovich, E. B. (2024). CORONARY HEART DISEASE. ANGINA EMERGENCY CARE. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(7), 235-242.

60. Komilovich, E. B. (2024). YURAK ISHEMIK KASALLIGI. STENOKARDIYANI DAVOLASHNING ZAMONAVIY TAMOYILLARI. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 3-11.
61. Jamshidovich, A. S. (2024). THE MOST IMPORTANT BENEFITS OF GINGER FOR THE HUMAN BODY'S IMMUNITY. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *4*(11), 269-273.
62. Axmedov, S. (2024). THE SPECIFIC EFFECT OF THE DRUG" BAKLASAN" IN CEREBROVASCULAR DISEASES AND ITS PRACTICAL SIGNIFICANCE TODAY. *Modern Science and Research*, *3*(12), 485-492.
63. Komilovich, E. B. Z. (2023). Coronary Artery Disease. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *3*(12), 81-87.
64. Komilovich, E. B. (2024). CORONARY HEART DISEASE. ANGINA TREATMENT. *Journal of new century innovations*, *46*(1), 95-104.
65. Komilovich, E. B. (2024). HYPERTENSION TREATMENT. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(7), 227-234.
66. Эргашов, Б. К. (2024). ИШЕМИЧЕСКАЯ БОЛЕЗНЬ СЕРДЦА. СТЕНОКАРДИЯ ПРОФИЛАКТИКА. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 21-31.
67. Axmedov, S. (2025). ВАЖНЫЕ СВОЙСТВА ПРЕПАРАТА ЭСКУЗАН ПРИ СОСУДИСТЫХ ЗАБОЛЕВАНИЯХ. *Modern Science and Research*, *4*(1), 380-387.
68. Эргашов, Б. К. (2024). ГИПЕРТОНИЧЕСКАЯ БОЛЕЗНЬ ДИАГНОСТИКА. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 70-78.
69. Komilovich, E. B. (2024). HYPERTENSION DIAGNOSTICS. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *38*(6), 42-49.
70. Xusenovich, M. S., & Turapjanovna, Z. M. (2024). SEMIZLIKNING TURLI FENOTIPLARDA KARDIOMETABOLIK XAVF OMILLARINI TAQQOSLASH. *SO'NGI ILMIY TADQIQOTLAR NAZARIYASI*, *7*(4), 112-116.
71. Husenovich, M. S., & Turabdjanovna, Z. M. (2024). STUDY OF DIURNAL PROFILE OF ARTERIAL HYPERTENSION IN DIFFERENT PHENOTYPE OBESITY. *образование наука и инновационные идеи в мире*, *43*(1), 129-131.
72. Xusenovich, M. S. (2024, September). SEMIZLIKNI TURLI FENOTIPLARIDA YURAK QON-TOMIR KASALLIKLARINI KELIB CHIQISH XAVFI PROGNOZI. In *INTERNATIONAL SCIENTIFIC RESEARCH CONFERENCE* (Vol. 3, No. 26, pp. 15-18).

73. Xusenovich, M. S. (2024). O ‘ZBEKISTONDA RESPUBLIKASIDA YURAK-QON TOMIR KASALLIKLARI TARQALISHI VA HOZIRGI KUNDAGI KO’RILAYOTGAN CHORA TADBIRLAR. *AMERICAN JOURNAL OF SOCIAL SCIENCE*, *2*(3), 79-82.
74. Xusenovich, M. S., & Allayarovich, A. A. (2024). O ‘ZBEKISTONDA YURAK-QON TOMIR KASALLIKLARI TARQALISHI VA HOZIRGI KUNDAGI TENDENSIYASI. *MODELS AND METHODS FOR INCREASING THE EFFICIENCY OF INNOVATIVE RESEARCH*, *4*(38), 54-57.
75. Ravshanovna, X. L. (2021, June). MINIMALLY INVASIVE METHODS OF TREATMENT OF DENTAL CARIES IN ADULTS. In *" ONLINE-CONFERENCES" PLATFORM* (pp. 118-119).
76. Ravshanovna, X. L. (2021, June). MINIMALLY INVASIVE METHODS OF TREATMENT OF DENTAL CARIES IN ADULTS. In *" ONLINE-CONFERENCES" PLATFORM* (pp. 118-119).
77. Khalilova, L. (2025). MAIN ASPECTS IN CARIES DIAGNOSIS. *Modern Science and Research*, *4*(1), 707-715.
78. Khalilova, Laziza. "GLASS IONOMER CEMENTS USED IN DENTISTRY." *Modern Science and Research* 3.12 (2024): 443-450.
79. Халилова, Л., Ахмедова, М., & Кузиева, М. (2025). ОСНОВНЫЕ АСПЕКТЫ ПРИ ДИАГНОСТИКИ КАРИЕСА. *Modern Science and Research*, *4*(1), 697-706.
80. Кузиева, Мадина, Малика Ахмедова, and Лазиза Халилова. "СОВРЕМЕННЫЕ АСПЕКТЫ ВЫБОРА МАТЕРИАЛА ДЛЯ ОРТОПЕДИЧЕСКОГО ЛЕЧЕНИЯ БОЛЬНЫХ, НУЖДАЮЩИХСЯ В ПРОТЕЗИРОВАНИИ ЗУБОВ." *Modern Science and Research* 4.1 (2025): 322-333.
81. Ахмедова, М., Кузиева, М., & Халилова, Л. (2025). СОСТОЯНИЕ АЛЬВЕОЛЯРНОГО ОТРОСТКА И ПЕРИОСТА ПРИ ИСПОЛЬЗОВАНИИ СЪЕМНЫХ ПРОТЕЗОВ. *Modern Science and Research*, *4*(1), 301-310.
82. Кузиева, М., Ахмедова, М., & Халилова, Л. (2025). ГАЛЬВАНОЗ И МЕТОДЫ ЕГО ДИАГНОСТИКИ В КЛИНИКЕ ОРТОПЕДИЧЕСКОЙ СТОМАТОЛОГИИ. *Modern Science and Research*, *4*(2), 203-212.