Clinical Alterations, Signs, and Issues in the Gastrointestinal System in Covid-19 Patients

Omonov Olimjon Yunusovich [1]

Annotation: The prevalence of COVID-19 in the world and its leading to serious complications and fatalities remain one of the global challenges of medicine today. Coronavirus infections manifest primarily as a lung infection, with fever and changes in the respiratory system in most symptomatic patients. However, it has significant extrapulmonary complications affecting many organ systems, including the gastrointestinal tract.

Keywords: COVID-19, OIT, anorexia, diarrhea, respiratory distress syndrome, SARS-CoV-2, mesenteric ischemia.

Relevance of the topic: Changes in the gastrointestinal tract at COVID-19: While most symptomatic COVID-19 patients experience fever, cough, shortness of breath, or loss of taste and smell sensations, one-third of patients present with gastrointestinal complaints. [1].

In an initial meta-analysis of 60 studies involving 4,243 patients in China, the overall prevalence of all gastrointestinal symptoms was 17.6 percent. Anorexia was the most common symptom (26.8 percent), followed by diarrhea (12.5 percent), nausea / vomiting (10.2 percent), and abdominal pain (9.2 percent). [2].

Below, the manifestations and complications of COVID-19 in the gastrointestinal tract, including intestinal ischemia, are discussed with particular emphasis on COVID-19 patients with severe disease.

A post-meta-analysis of experiments in more than 18,000 patients worldwide showed that diarrhea was the most common (11.5 percent) gastrointestinal symptom, followed by nausea and vomiting (6.3 percent), followed by abdominal pain (2.3 percent). percent). [3].

In a small group of patients with the most severe SARS-CoV-2 infection, which manifests itself in the form of acute respiratory distress syndrome and requires intensive care, diarrhea occurs in one-third of patients who first visit the hospital, and symptoms such as nausea or vomiting occur in one-fifth. [4].

Objective: To study the degree of manifestation of clinical changes in the gastrointestinal tract in patients with COVID-19.

Materials and methods: The Gastroenterology Department of the Bukhara Regional Multidisciplinary Medical Center conducted research on 60 patients with previous cases of COVID-19. Of the 60 patients surveyed, 40 patients were distributed in the main group and 20 patients were in the control group.

Research results: According to the results of a study of 60 patients treated in the Department of Gastroenterology of the Bukhara Regional Multidisciplinary Hospital, the prevalence of gastrointestinal symptoms among patients was as follows.

---

[1] Bukhara State Medical Institute

Clinical signs	Number of patients / percentage	The main group number/ percentage	Control group Number/ percentage
Anorexia	25 / 41,7%	17 / 28,3%	8/ 13.3%
Diarrhea	15 / 25%	10 / 16.67%	5 / 8.33%
Nausea/ Vomiting	11 / 18.3%	8 / 13.33%	3 / 5%
Pain in the abdomen	9 / 15%	6 / 10%	3 / 5%

According to the study, anorexia is a common symptom among patients, observed in 25 of the total patients, or 41.7%. Correspondingly, it was 28.3% among the patients in the main group and 13.3% among the patients in the control group.

The next most common symptom is diarrhea, which is observed in 25% of the total number of patients, or 25%. In turn, this symptom was observed in 16.67% of patients in the main group and in 8.33% of patients in the control group. In addition, one of the most common symptoms, nausea and vomiting, was also observed in 11 of the total patients, or 18.3%. Among the primary and control group patients, the rates were 13.3% and 5%, respectively.

Among these patients, abdominal pain was noted as a common observable symptom and was observed in 9 of the total patients, i.e., 15%. This symptom was observed in 10% of patients in the main group, while this symptom was observed in 5% of patients in the control group.

COVID-19 disease as a disease of the gastrointestinal tract: Patients with severe COVID-19 are at particularly high risk of developing gastrointestinal tract complications. Often during long-term hospitalization, 74–86% of patients with COVID-19 show gastrointestinal-related complications ranging from intolerance to self-medication to life-threatening intestinal obstruction ischemia.

Researchers at Stanford University recently found that one-third of patients with mild COVID-19 had symptoms that affected the digestive system.

Another recent reliable source study published by researchers in Beijing found that 3 to 79 percent of people with COVID-19 develop gastrointestinal symptoms. Diarrhea is more common in people with COVID-19. A scientific article published in the American Journal of Gastroenterologists reported that 206 patients with mild COVID-19 were studied. Of these, 48 patients were found to have only digestive symptoms, while another 69 patienets were found to have digestive and respiratory symptoms. Of the 117 people with stomach pain, 19.4 percent experienced diarrhea as the first symptom. Leading researchers analyzed clinical trials and reports of digestive system-related reports of all COVID-19 disease published between December 2019 and February 2020. They found that vomiting was observed in 3.6-15.9% of adults and 6.5-66.7% of children.

Many people with COVID-19 report loss of appetite, often along with other gastrointestinal symptoms. According to the researchers, 39.9-50.2% of people with COVID-19 have symptoms of loss of appetite. . [5].

About the passage of diarrhea without fever: In some people, diarrhea can be like a fever, without other symptoms similar to the flu. Diarrhea may be the first sign of COVID-19. In some cases, flu symptoms may appear after diarrhea. Some people may only experience gastrointestinal symptoms without developing the more common symptoms.

The relationship between COVID-19 and gastrointestinal symptoms can be explained as follows:

Reliable research sources suggest that the virus that causes COVID-19 can enter the digestive system through an enzyme called angiotensin-converting enzyme-2 (ACE 2) through cell surface receptors. Receptors for this enzyme are 100 times more common in the gastrointestinal tract than in the respiratory tract. [6].

POSSIBLE RISK FACTORS IN COVID-19: Some patients with chronic gastrointestinal disease may have a higher risk of more severe disease due to COVID-19. Potential risk factors in these patients include their chronic inflammatory diseases, joint diseases (e.g., diabetesmellitus), and the use of glucocorticoids

CLINICAL INDICATORS AND DIAGNOSTIC TEST :

Signs of disease exacerbation that can be analyzed by COVID-19 - The clinical presentation of several gastrointestinal diseases (e.g., Crohn's disease, ulcerative colitis) may mimic COVID-19 infection. For example, diseases manifested by diarrhea, nausea, vomiting, or anorexia. Thus, for patients diagnosed with chronic AIDS, clinical symptoms should be evaluated to determine whether the disease is exacerbated or associated with COVID-19.)

Digestive symptoms - Patients with COVID-19 usually present with fever and respiratory symptoms; however, gastrointestinal symptoms are commonly reported in patients diagnosed with COVID-19. For example, in a study involving 318 adult patients hospitalized with COVID-19 in Beijing, China, 195 patients (61 percent) reported at least one digestive symptom, 110 patients (35 percent) reported anorexia, and 107 reported diarrhea. . patients (34 percent), nausea in 84 patients (26 percent). Similarly, in another study of 204 patients with COVID-19, 103 patients (51 percent) reported at least one digestive symptom, and the most reported symptoms were anorexia and diarrhea. [7].

Some patients with COVID-19 developed isolated OIT symptoms that may have preceded the development of respiratory symptoms. As an example, in a study of 60 patients with COVID-19, 10 patients (16 percent) reported OIT symptoms (e.g., diarrhea, nausea, vomiting) in the absence of respiratory complaints.

Research data show that the detection of symptoms of diarrhea and viral RNA in feces in patients with COVID-19 allows for a favorable prognosis. In a cohort study involving 60 hospitalized patients with COVID-19, diarrhea symptoms were associated with a lower risk of death in the hospital compared to the absence of diarrhea. (OR 0.38, 95% CI 0.17-0.86). Thus, the SARS-CoV-2 virus prefers the intestinal mucosa in some patients with OIT symptoms, and such patients experience a milder type of disease than patients with respiratory symptoms. .

In a study of 20 patients with pre-existing SARS-CoV-2 pneumonia, fecal samples from patients with diarrhea had higher rates of detection of SARS-CoV-2 virus RNA by real-time polymerase chain reaction than patients without diarrhea (69% to 17%).

For patients with symptoms of the gastrointestinal tract, we recommend testing for COVID-19 in the following cases:

➢ Hospitalized patients with new onset of AID symptoms

➢ Outpatients with a fresh onset of AID symptoms for more than 48 hours

➢ Patients diagnosed with AIDS (eg Crohn's disease) with symptoms indicating an exacerbation of the disease (eg, diarrhea, vomiting)

In a small number of patients, OIT symptoms such as diarrhea may occur or precede the development of respiratory symptoms. Although a diagnosis of COVID-19 may be suspected based on these symptoms, additional factors that determine the decision to perform a test include the patient's geographical location, risk of exposure, infection rate in the community, and test availability.

Gastrointestinal Complications - Several gastrointestinal complications have been reported in severe patients with COVID-19. In a follow-up study involving 184 patients with acute respiratory distress syndrome, gastrointestinal complications were higher (74 to 37 percent) in patients with COVID-19-associated acute respiratory distress syndrome compared with COVID-19-incompatible Acute Respiratory Distress Syndrome; morbidity rate 2.33 to 95%). In particular, high levels of the virus with COVID-19 (48 to 22 percent) were associated with intestinal ischemia (4 to 0 percent) and increased aminotransferase levels (55 to 27 percent) with a CI of 1.52 to 3.63 percent. Although the propensity of patients in this single-center study was consistent with the assessment score of age, comorbidity, and serial organ failure when admitted to the intensive care unit, they were inconsistent with inflammatory symptoms associated with poor outcomes of COVID-19. It is also unclear whether small bowel ischemia is associated with high opioid requirements and COVID-19-associated coagulopathy.

Further research is needed to confirm these findings and to identify the pathophysiological mechanisms behind these complications.

In summary, some of the symptoms associated with COVID-19 disease in the early stages include symptoms related to the OIT system, such as vomiting or diarrhea. Detection of these symptoms can not only lead to a slowing of infection, but can also open up the possibility of identifying new treatments to reduce COVID-19 exacerbation. In order to correctly interpret the stages of the disease, and especially if the detected viral infection is considered contagious and how it is associated with respiratory or gastrointestinal symptoms, more research is needed in that area.

In patients with COVID-19 with digestive symptoms and inflammatory bowel disease, the clinical features of the disease are a condition that compels all specialists to marry. In addition, diarrhea and other gastrointestinal symptoms are common in patients with COVID-19, but data on the significance of these symptoms are insufficient. Viral infection leads to changes in intestinal permeability, which leads to enterocyte dysfunction.

When we studied what happened to coronavirus in other scientific studies, we found that diarrhea was a common symptom in patients with severe acute respiratory syndrome (SARS), and we observed that this indicator was 40% in turn. Intestinal problems are also related to the severity of the infection. There is an increasing need for artificial ventilation and intensive care to improve respiratory function in patients with diarrhea.

Many patients with coronavirus complained of digestive symptoms such as diarrhea. There is currently insufficient evidence for the effectiveness of anti-diarrheal drugs, but as in all COVID-19 patients, adequate rehydration, i.e. stabilization of the water-salt balance in the body, has been performed. Thus, SARS-CoV-2 infection, which may be associated with OIT symptoms such as diarrhea, should be reported and screened for early diagnosis of COVID-19. Instead of waiting for respiratory symptoms to appear, this factor should be taken into account when patients suspect infection, which allows us to make an early diagnosis. Patients with COVID-19, especially those with digestive symptoms, may take longer to be admitted to the hospital and may have worse clinical outcomes than patients who do not suffer from these symptoms. Similarly, an average of 9 days elapsed from the onset of symptoms to hospitalization in patients with digestive symptoms, and 7.3 days in patients with respiratory symptoms. This may indicate that those with digestive symptoms were more likely to wait for a diagnosis in the hospital because they did not suspect that they were SARS-CoV-2-positive in the absence of respiratory symptoms.

It is also noted that patients with digestive symptoms have clinical manifestations such as anorexia, diarrhea, vomiting, or abdominal pain. As the active period of the disease increased, the symptoms of the gastrointestinal tract became more pronounced, but the high rate, especially in patients admitted with symptoms of anorexia, was 41.7%. Our study showed that COVID-19 patients experienced gastrointestinal symptoms such as diarrhea (25%), anorexia (41.7%), and nausea (18.3%) and abdominal pain (15%). However, the underlying pathophysiology of symptoms in the gastrointestinal tract has not been fully elucidated.

Literature list:

1. Kaafarani h, by the current of old el moh M, Hwabejire JO, et al. Gastrointestinal complications in critically ill patients With COVID-19. Ann Laxative 2020; 272:e61.

2. Scutari R, L Piermatteo, manuel m, ciancio a, et al. The long-term sar-CoV-2 infection associated with acute cholecystitis with Different body fluids, including two patients with Viral dissemination. Life (Basel) 2020; 10.

3. Pu I G, Giménez-Mila M, Campistol e, et al. Concomitant diseases in the Development of the COVID-19 critically ill patients. Ream My Esp Anestesiol Revs (At Most Ed) 2021; 68:37.

4. Akkuş C, Yilmaz H, S, Mizrak a, et al. Development of pancreatic injuries in the course of COVID-19. Character In The Act Gastroenterol 2020; 83:585.

5. Keshavarz P, F, Rafiee, kavani of h, et al. Ischemic gastrointestinal complications of COVID-19: a systematic review of imaging for presentation to add on boaz. Cl Imaging That My Boaz 2021; 73:86.

6. Seeliger B, G Philouze, Cherkaoui z, et al. Not with acute abdomen in patients with sar-CoV-2 infection or co-infection. Langenbecks Fir 2020 Laxative; 405:861.

7. Bianco F, Ranieri-stock company Paterniti g, et al. Acute intestinal ischemia in a patient with COVID-19. Tech Coloproctol 2020; 24:1217.

8. Хазратов У.Х., Нарзиев Ш.С., Эркинова Н.Э. Оценка эффективности ультразвуковой ингаляции при рефлюкс индуцированной астме// Терапевтический вестник Узбекистана - 2019.- №3 .- С. 51-55.

9. Khazratov U.Kh., Tosheva Kh.B., Khalilova F.A. Studyng the frequency of the symptoms of gastroesofhageal reflukx disease. Proceedings of multidisciplinary International Scientific-Practical Conference "Current Issues of Science.Education and Induction and Industry in Modem Research" 10-12 th. December 2020., Journal INX – ISSN No: 2581-4230.

10. Narziev Sh. S., Khazratov U.Kh., Tosheva Kh.B. Effectiveness of nebuliserotherapy inreflux-associated asthma. Asian Journal of Multidimensional Research 2021. April. Vol 10. P. 944-948.

11. Kh, K. U. Tosheva Kh. B., Khalilova FA Studyng the frequency of the symptoms of gastroesofhageal reflukx disease. In *Proceedings of multidisciplinary International Scientific-Practical Conference "Current Issues of Science. Education and Induction and Industry in Modem Research* (pp. 10-12).

12. Bekmurodovna, T. K., & Gadaevich, G. A. (2021). Dynamics of Renal Fibrosis Markers on the Basis of Complex Treatment in Chronic Heart Failure with Anemia.

13. Tosheva, K. B., Erkinova, N. E., Khalilova, F. A., Gadaev, A. G., & Djuraeva, N. O. (2020). Comorbid states in patients with chronic heart failure. Regional level of the problem (Preliminary Study). *Journal of Cardiovascular Disease Research*, *11*(2), 59-65.

14. Khazratov, U. X., Narziev, S. S., & Tosheva, B. K. (2021). Effectiveness of nebuliserotherapy in reflux-associated asthma. *ASIAN JOURNAL OF MULTIDIMENSIONAL RESEARCH*, *10*(4), 944-948.

15. Гадаев, А. Г., Туракулов, Р. И., Курбонов, А. К., Тошева, Х. Б., Эркинова, Н. А., Халилова, Ф. А., & Джураева, Н. Д. (2019). Сурункали юрак етишмовчилиги камқонлик билан кечганда даволаш тамойиллари.

16. Гадаев, А. Г., Халимова, Х. Х., Элмурадов, Ф. Х., Тошева, Х. Б., & Халилова, Ф. А. (2018). Роль некоторых маркеров в оценке течения Хронического кардиоренального синдрома.

17. Тошева, Х. Б., & Кенжаева, З. О. (2014). Пропаганда здорового образа жизни в селе как механизм сохранения здоровья сельского населения.

18. Bekmurodovna, T. K., Erkinovna, E. N., Gadaevich, G. A., Oripovna, D. N., & Abdujalolovna, K. F. (2020). Comorbid States in Patients with Chronic Heart Failure. Regional Level of the Problem (Preliminary Study). *Journal of Cardiovascular Disease Research*, *11*(2), 59-65.

19. Клычева, М. А., Тошева, Х. Б., Халилова, Ф. А., & Нуритов, А. И. (2015). Роль психологии семейного воспитания в формировании поведенческих реакций у подростков. *Наука молодых–Eruditio Juvenium*, (2), 75-79.

20. Хазратов, У. Х. (2022). Особенности Течения Бронхиальной Астмы В Условиях Жаркого Климата. *Central Asian Journal of Medical and Natural Science*, *3*(4), 227-233.

21. Khotamova, R. S. (2022). Monitoring of Kidney Fibrosis Changes in Patients with Chronic Heart Failure. *Central Asian Journal of Medical and Natural Science*, *3*(4), 199-204.

22. Bekmurodovna, T. K., & Chorievich, Z. A. (2021). Study of frequency indicators of comorbid states at different functional classes of heart failure. *ACADEMICIA: An International Multidisciplinary Research Journal*, *11*(3), 2556-2560.

23. Тошева, Х., & Кайимова, Д. И. (2017). Метаболик синдромнинг ривожланишида ирсиятнинг ахамияти. *Биология и интегративная медицина*, *1*, 132.

24. Ашурова, Н. Г. (2022). Значение Немедикаментозной Коррекции Нарушений Углеводного Обмена. *Central Asian Journal of Medical and Natural Science*, *3*(5), 10-22.

25. Bekmurodovna, T. K. (2023). CLINICAL-FUNCTIONAL PARAMETERS OF BRONCHIAL ASTHMA. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 3(5), 507-513.

26. Тошева, Х. Б. (2023). КЛИНИЧЕСКИЕ ПОКАЗАТЕЛИ БРОНХИАЛЬНОЙ АСТМЫ В УСЛОВИЯХ ЖАРКОГО КЛИМАТА. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 3(5), 498-506.

27. Тошева, Х. Б. (2022). КЛИНИКО-ФУНКЦИОНАЛЬНЫЕ ПОКАЗАТЕЛИ БРОНХИАЛЬНОЙ АСТМЫ В УСЛОВИЯХ ЖАРКОГО КЛИМАТА. BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI, 2(12), 756-763.

28. Tosheva, K. B. (2022). Significance of Cystatin-S and Galectin-3 Levels in Patients with Chronic Heart Failure. Central Asian Journal of Medical and Natural Science, 3(4), 189-194.

29. Gadaevich, G. A., Bekmurodovna, T. K., Abdujalolovna, X. F., Erkinovna, E. N., & Orifovna, D. N. (2021). EVALUATION OF THE EFFECTIVENESS OF TREATMENT IN CHRONIC HEART FAILURE WITH ANEMIA. EDITOR COORDINATOR, 701.

30. Гадаев, А. Г., Тошева, Х. Б., Элмурадов, Ф. Х., & Халилова, Ф. А. (2018). Фиброзные изменение в почках у больных ХСН. Терапевтический вестник. Ташкент, 2, 86-90.

31. Khazratov, U. X., Narziev, S. S., & Tosheva, B. K. (2021). Effectiveness of nebuliserotherapy in reflux-associated asthma. ASIAN JOURNAL OF MULTIDIMENSIONAL RESEARCH, 10(4), 944-948.

32. Rizoyevna, H. L. (2023). Bosh Miya Shikastlanishida Miya Va O'pkaning O'zaro Ta'sirini O'rganish. AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI, 2(10), 93-98.

33. Nurbaev F. E., Djumaev B.Z**.** Determination of epidemiology of gene and genotypes determining body weight by ketle indaex indicator :1-5 www.iejrd.com **-**ISSN NO:-2349-0721

34. Nurbaev.F.E., Djumaev B.Z. The role of genes in the heuman body in overweight and obesity. Bukhara, New.Day Journal in Medicine.2019.№3 / 27.B. 206-211

35. Орзиев З.М., Нурбаев Ф.Э., Оценка способа эффективной терапии урсосаном при ХЗП; Терапевтичекий вестник Узбекистана .Тошкент -2014- №4.-С. 26-29.

36. Нурбаев Ф.Э., Туксанова З.И. "Остеоартрознинг тарқалиш сабаблари, ривожланиш механизми, кечиш хусусиятларининг ўзига хослиги." Тиббиётда янги кун. Илмий журнал. 2(30). 2020.485-488 б.

37. И.Р.Мавлянов З.М. Орзиев. Нурбоев Ф.Э.,Э.Э.Савронов Features of Subtransaminasemia Interpretation I J B M International journal BIOMEDICINE 2011.№ 4 .249-252 стр Америка

38. И.Р.Мавлянов З.М. Орзиев. Нурбоев Ф.Э.,Э.Э.Савронов Spectrum of Reasons of Extrahepatic " Subtransmenazemies" EURASIAN JOURNAL OF BIOMEDICINE 2012 № 2 4-8 стр Япония.

39. Нурбаев Ф.Э., Джумаев Б.З.,Рахматова Д.Б..Саидова М.М.,Кодирова Ш.С «Роль эндотоксемии в развитии внутрипеченочного холестаза» . Вестник Проблемы биологии и медицины №3 98-100 стр Украина

40. Нурбаев Ф.Э., Сулейманов С.Ф.,Садыкова С.Ш.,Махмудов Б.Ф.,Хикматов Б.Ф.,Муродова Г.Я. «Эндогенная интоксикация как фактор развития внутрипеченочного холезтаза при

хронеческом гепатите «В» Актуалъни роблеми сучасной медицини 2012. № 1-2 133-135 стр Палтава.

41. Нурбаев Ф.Э. " A nev approach in the ursotherapy ofbilious form of aagenaes syndrome» The Fourthh European Conference on Diologi and Medikal 2015. 104-105стр.Авсрия.Вена.

42. Нурбаев Ф.Э., Жумаев Б.З., Солиев О.О, Савронов Э.Э. Хожиметов А.А., Ахмадалиев Н.Н "Значение изменений активности ферментов с различной внутриклеточной локализации у больных вирусным гепатитом В» Научный журнал. Инфекция, иммунитет и фармакология.2010 №5. 53-55 ст Ташкент.

43. Нурбаев Ф.Э., Рахматова Д.Б., Савронов Э.Э., Солиев О.О. «Выбор назначение гепатопротекторов у больных хроническими заболеваниями печени» Научный журнал. Проблемы биологии и медицины 2011. №1. 26-29 стр.Самарканд

44. Мавлянов И.Р.,Орзиев З.М., Нурбаев Ф.Э." Особенности распространения, этиологии и патогенеза хронических диффузных заболеваний печени» Журнал теоритичекой и клинической медицины 2011..№2 81-85 стр Тошкент

45. Нурбаев Ф.Э., Хожиметов А.А.,Ахмадалиев Н.Н. «Некоторые аспекты гибели гепатоцитов у больных хроническим гепатитом «В» с преобладанием холестатического синдрома» Инфекция, иммунитет, фармакология.2011.№ 1-2 .235-238стр. Тошкент.

46. Мавлянов И.Р.,Орзиев З.М., Нурбаев Ф.Э. " Современные подходы к терапии хронических диффузных заболеваний печени» Инфекция, иммунитет, фармакология.2011.№ 3 214-223 стр. Тошкент.

47. Нурбаев Ф.Э., Джумаев Б.З,Солиев О.О,Эргашев Ф.Ф «Оценка клинической информативности цистатина с и протенна с у болных внутрипеченочным холезтазом» Проблемы биологии и медицины 2012. №1 97-101 стр.Самарканд.

48. Нурбаев Ф.Э., Савронов.Э.Э.,Эргашев Ф,Ф. « Сравнительная оценка спектра этиологических факторов цирроза печени в Бухарском и Навоийском регионах.» Проблемы биологии и медицины .2013.№4.1 79-81 стр Самарканд.

49. Нурбаев Ф.Э., Солиев О.О. Эргашев Ф.Ф. «Выводы врачей по Навоинской и Бухарской областям по выбору и назначению гепатопротекторов для больных хроническими заболеваниями печени.» Проблемы биологии и медицины.2013. №4.1 77-78 стр .Самарканд.

50. Нурбаев Ф.Э., Джумаев Б.З.,Савронов Э.Э. ,Эргашев Ф.Ф. «Сравнительная оценка проведения ABC,VEN,DDD анализа у больных хроническим зоболеваниями печени» Проблемы биологии и медицины. 2013.№4.1 82 - 83 стр Самарканд.

51. Мавлянов И,Р. Нурбаев Ф.Э,Касымов.А.Ш.,Мамадяров А.М.,Абдашимов З.Б. «Фармакоэкономические аспекты лечения больных с хроническими заболеваниями печени.» Фармацевтический весник Узбекистана.2014 № 4 57 – 60 стр.