
Test for Procalcitonin as a Way to Predict Patients with Respiratory Tuberculosis

Abukarimov Mirzobek Ulugbek o'gli
Bukhara Medical Institute

Abstract: The study showed that a positive test for PCT in patients with pulmonary tuberculosis serves as a test predicting bacterial excretion. It was detected in 89.5% of MBT+ patients and coincided in 79.0% with the detection of mycobacterium by luminescent microscopy and in 89.5 % with microbiological confirmation by sowing on BACTEC 960.

Keywords: tuberculosis, procalcitonin, luminescent microscopy, diagnosis.

Introduction. Every year, 3 million people die of TB worldwide, and another 8 million fall ill. Over the past few years, domestic doctors have recorded an explosion of this disease in our camp. Every year the number of patients increases by 25-30% and, which is especially alarming, children and adolescents often become victims. Inflammatory processes are generally very similar

Regardless of their cause. One of the most significant laboratory methods for diagnosing infections that have appeared in recent years is the determination of the level of procalcitonin (PCT) of blood plasma. The role of procalcitonin as a marker of sepsis and septic shock has long been well known. Revealing the Significance of Procalcitonin with pulmonary tuberculosis is currently in stages of study. Lack of sputum in more of patients in this age group, even in the presence of destructive changes in the lungs, does not allow to identify the causative agent of the disease and conduct tests for drug sensitivity of Mycobacterium tuberculosis (MBT) [2, 3].

According to official statistics, destructive pulmonary tuberculosis was diagnosed in 13.4% of newly diagnosed patients. Children and 37.3% of adolescents. Proportion of bacteria excretory was 4.6% among children and 26.9% among adolescents. Detection of Mycobacterium tuberculosis in sputum Of patients with tuberculosis of the respiratory organs is carried out by microbiological methods and takes a certain time: fluorescence microscopy - response after 24 hours, detection of MBT DNA by PCR - 24 hours, culture Using liquid media BACTECMGIT 960 from 2 to 4 weeks [4]. The search for biological markers of infection that serve as a guide for the activity of bacterial Population and disease severity remains relevant problem.

Materials and methods

In an article with the aim of studying the significance of determining the level procalcitonin in patients with destructive pulmonary tuberculosis, a cohort prospective study was conducted over the period 2021–2022 in a group of 27 children and adolescents. Children there were 11 people aged 11–12 years, 31 adolescents aged 16–19 years, of which 12 were boys and 30 were girls. The study included as newly identified patients (11 people), as well as patients admitted for re-treatment from other anti-tuberculosis institutions in Bukhara due to the ineffectiveness of the ongoing chemotherapy (cavities in the lungs) - 11 people.

All patients underwent a test for procalcitonin. To determine the concentration procalcitonin in blood plasma, a semi-quantitative immunochromatographic method for rapid diagnostics (BRAHMS PCT-Q) was used. To the diagnostic kit Includes one test strip and one pipette. Using a pipette, 200 µl of plasma was applied to the well of the strip. Incubation time is 30 minutes at room temperature. After 30 minutes, the concentration of PCT in the sample was determined by comparing the staining intensity of the test line with the stained blocks on the comparison card. At a PCT concentration <0.5 ng/ml, the result was considered negative. At a concentration of 0.5 ng / ml and more experienced strip took on a red color, while the color intensity is directly proportional to the concentration of PCT (reference range of values: up to 0.5 ng/ml, 0.5–2 ng/ml, 2–10 ng/ml, 10 ng/ml or more). Serum procalcitonin level blood of the studied groups of patients was determined by the method ELISA using the test system "Procalcitonin-IFABEST". Effective cough at the time of admission to the clinic was noted only in 37.0% of patients. In this regard, the collection of sputum for the study on MBT in the remaining 63.0% of patients presented certain difficulties.

In the absence of sputum, oropharyngeal flushes were collected (SRG). Diagnostic study of the material on MBT indicators of positive prognostic value (PPV) and negative prognostic value (NPV).It was carried out three times by luminescent bacterioscopy and using an automated system BAKTEK-960 MGIT.In order to study the significance of the PCT test for predicting bacterial excretion in children and adolescents with pulmonary tuberculosis, a calculation was carried out.

Results

The study of the level of PCT in patients with destructive pulmonary tuberculosis showed that out of 48 patients, 19 (39.6%) tested positive for procalcitonin (0.5-2.0 ng/ml), 29 (60.4%) tested negative (< 0.5 ng/ml).For procalcitonin with the results of a study of diagnostic material on MBT by luminescent bacterioscopy and seeding on BACTEC 960 MGIT.

The value of the PKT test	Number of patients	MBT "+"	Luminescent microscopy:	BACTEC 960: MBT growth received
PKT "+"	19 100 %	17 89,5 %	15 79,0 %	17 89,5 %
PKT "-"	29 100 %	15 51,7 % P 1-2= 0,016	5 17,2 % P 1-2 < 0,001	15 51,7 % P 1-2 = 0,016

As can be seen from Table 1, in patients with a positive test for PCT, bacterial excretion was significantly more often detected both by luminescent microscopy and by.As can be seen from Table 1, in patients with a positive test for PCT, bacterial excretion was significantly more often detected both by luminescent microscopy and by sowing on BACTEC 960: 79.0 and 17.2%, respectively (p < 0.001), 89.5 and 51.7%, respectively (p = 0.016).

		MBT	
		by luminescent microscopy detected	not detected
PKT test	Positive	Truly Positive 14	False Positive 3
	Negative	False	Truly

		Negative 4	Negative 23
--	--	---------------	----------------

Table 2 shows the ratio of the results of the PCTTEST and the results of the detection of MBT in the diagnostic material by luminescent microscopy.

Based on the data presented in the table. 2 data calculated the PPV and NPV values of the PCT test to predict bacterial excretion, confirmed by the method of luminescent microscopy. The positive prognostic value of the PCT test was 79.0%,

Which indicates the possibility of using this test to predict massive bacterial excretion in children and adolescents with destructive pulmonary tuberculosis. The NPV index was 82.8%, which makes it possible to exclude massive bacterial excretion in patients with a high degree of probability.

		MBT by seeding method on BACTEC 960	
		growth revealed	no growth detected
PKT test	Positive	Truly Positive 17	False Positive 2
	Negative	False Negative 15	Truly Negative 14

Table 3 shows the ratio of the results of the PCT test and the results of detecting the growth of MBT in the diagnostic material by seeding on BACTEC 960 MGIT Based on the data presented in Table 3, the PPV and NPV indicators of the PCT test were calculated to predict bacterial excretion, confirmed by seeding on BACTEC 960. The PPV of the PCT test was 89.5%, which also indicates about the possibility of using this test to predict massive bacterial excretion in patients with destructive pulmonary tuberculosis. The NPV index was 48.3%. The level of procalcitonin determined by the method The ELISA in the blood serum of patients with a positive result according to the semi-quantitative immunochromatographic method of rapid diagnosis was 177.02 ± 96.12 pg/ml, and in those with a negative immunochromatographic test -77.75 ± 9.74 pg/ml. The differences turned out to be statistically unreliable ($t = 0, 324025$).

Consulation

That a positive test for PCT in patients with pulmonary tuberculosis serves as a test predicting bacterial excretion. It was detected in 89.5% of MBT+ patients and coincided in 79.0% with the detection of mycobacterium by luminescent microscopy and in 89.5% with microbiological confirmation by sowing on BACTEC 960. According to our according to the opinion, a positive test for PCT indicates a high epidemic danger of the patient, which requires his isolation and a set of anti-epidemic measures.

Literature

1. Isomiddin USMONOV, Umrzok SHUKUROV. (2021). Features of the Clinical Course, the State of Diagnosis and Treatment of Hiv-Associated Pulmonary Tuberculosis in Modern Conditions Literature Review. Annals of the Romanian Society for Cell Biology, 1809–1828.

2. Isomiddin Xaydarovich Usmonov, Nodir Yusufovich Kobilov. (2021). Epidemiology, Clinical Course, Diagnosis and Treatment of Generalized Tuberculosis in Modern Circumstances Literature Review. Annals of the Romanian Society for Cell Biology, 25(2), 3806–3819.
3. Kh U. I., Muazzamov B. R., Jumaev M. F. Features of diagnostics and treatment of drug-resistant forms of pulmonary tuberculosis //International journal of pharmaceutical research. – 2021. – Т. 13. – №. 1. – С. 2484-2489.
4. Парпиева, Н. Н., Усмонов, И. Х., Кобилов, Н. Ю., & Жумаев, М. Ф. (2020). Особенности диагностики и лечения при генерализированных формах туберкулёза. Новый день в медицине. Бухара, (2), 424-428.
5. И. Х. Усмонов, У. З. Шукуров, М. У. Абдукаримов, Ж. О. Сулаймонов СОВРЕМЕННАЯ ДИАГНОСТИКА И ЛЕЧЕНИЯ ТУБЕРКУЛЕЗА ЛЕГКИХ У ВИЧ ИНФИЦИРОВАННЫХ БОЛЬНЫХ // Scientific progress. 2021. №5. URL: <https://cyberleninka.ru/article/n/sovremennaya-diagnostika-i-lecheniya-tuberkuleza-legkih-u-vich-infitsirovannyh-bolnyh> (дата обращения: 16.03.2022).
6. Муаззамов, Б. Р., & Жумаев, М. Ф. (2018). О преподавании фтизиатрии на лечебном и медико-педагогическом факультетах. Материалы VIII Съезда фтизиатров и пульмонологов Узбекистана. Тошкент, 109-110.
7. Aslonov F.I, Rustamova S.A., Rahmonova K.M. Immunopatological aspects in patients with first detected pulmonary tuberculosis // World Bulletin of Public Health. Vol. 4 (2021). P. 91-95.
8. Akhtamovna, K. N. (2021). Fibrotic Complications in the Lungs in Patients Who Have Had COVID-19 Pathogenesis of COVID-19. European Journal of Life Safety and Stability (2660-9630), 9, 14-24.
9. Жумаев Мухтор Фатуллаевич СЛОЖНОСТИ ДИАГНОСТИКИ И ЛЕЧЕНИЯ ЛЕКАРСТВЕННО-УСТОЙЧИВЫХ ФОРМ ТУБЕРКУЛЕЗА ЛЕГКИХ // Вопросы науки и образования. 2021. №15 (140). URL: <https://cyberleninka.ru/article/n/slozhnosti-diagnostiki-i-lecheniya-lekarstvenno-ustoychivyh-form-tuberkulyoza-legkih> (дата обращения: 16.03.2022).
10. Халилова Д. С. Пути улучшения диагностических и тактических возможностей в лечении внебольничных пневмоний в Бухарской области //Ўзбекистонда илмий-амалий тадқиқотлар. – 2021. – Т. 2. – №. 28. – С. 18.
11. С.А. Рустамова, К.С. Мухамедов, М.Х. Джурабаева, М.И. Ходжаева Спектр лекарственной устойчивости и эффективность лечения впервые выявленных больных туберкулезом легких // Медицинский альянс "Национальная Ассоциация Фтизиатров". 2015. № 1. С. 116-116.
12. Guljamol Fazliddinonvna Makhmudova, Adkhambek Uygunovich Nurboboyev. Treatment of mechanical jaundice via the modern way// Scientific progress, 2021.-№6.-P.530-537
13. Makhmudova G.F. Age-related clinical, anatomical and morphological features of malignant tumors of the cervix// Journal of science and technology//2021.-P.-475-480
14. М.А. Ахмадова, А.Т., Сохибова З.Р., Д.К. Худойбердиев., Ж.Р. Нуров Диагностика эхинококкоза у молодёжи на современном этапе. /Тиббиётда янги кун 2019 й.3(27)-стр 54-56

15. М.А. Ахмадова, А.Т. Чўлиев, Ж.Р. Нуров, Д.К. Худойбердиев. Лучевая диагностика эхинококкоза печени. // Биология ватиббийтмуаммо лари. 2019, №4.2(115) с.20-25
16. Сохибова З.Р., Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени. // Oriental Renaissance: Innovative, Educational, natural and social sciences/2021 й - стр 203-212.
17. Сохибова З.Р., Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени. // Oriental Renaissance: Innovative, Educational, natural and social sciences/2021 й - стр 203-212.
18. Нарзиева Д.Ф. Значение иммуногистохимических маркеров при метастазировании рака молочной железы в легкие. // Oriental Renaissance: Innovative, educational, natural and social sciences. // -2021 Vol.1-С.170-175
19. Xalikova Feruza. Current concepts of breast cancer risk factors // International journal of philosophical studies and social sciences // 2021.- Vol 1.-P.57-66.
20. Z.R. Sokhibova, M.R. Turdiyev, (2021). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(02), MO- 145.
21. Mamedov U.S., Pulatova D.S.H. The Results of Cancer Treatment of the Oral Cavity Tumors in // the Republic of Uzbekistan European journal of Pharmaceutical and Medical Research. -2019. - 6(9). - P. 326-329.
22. Narziyeva D.F., Jonibekov J.J.; Morphological features of tumor in different treatment options for patients with locally advanced breast cancer // Middle European scientific bulletin. Volume 7- 2020-Dec. – P. 105-10
23. Nurov Jamshid Raxmatovich. Morphofunctional characters of the greater omentum // International Journal of Discoveries and Innovations in Applied Sciences. – 2021. – Vol. 1(5). – P. 130-134.
24. Nurov J.R., Khalikova F.S. Long-term results of surgical treatment patients with stomach cancer // Вестник науки и образования. – 2020. – №23-2(101). – С. 85-89.
25. R. R. Navruzov. Morphological and morphometric changes of the stomach layer of one monthly white rats // Journal For Innovative Development in Pharmaceutical and Technical Science (JIDPTS). Volume:4, Issue:5, May:2021 pp :(7-10)
26. R. R. Navruzov. Lymphothorp therapy in the complex of treatment of purulent inflammatory diseases of the hand in outpatient conditions // New day in medicine 30.2020
27. Гафур Нормуродович Саидов, Учкун Гафурович Абдукаримов, Гулжамол Фазлиддиновна Махмудова. Эпидемиологические показатели первично-множественных опухолей (обзор литературы) // Биология и интегративная медицина // 2019 № 11 (39).-С.
28. Нуров Ж.Р. Послеоперационная аналитика раннего периода хирургического лечения злокачественной опухоли желудка // Oriental Renaissance: Innovative, educational, natural and social sciences. – 2021. – Vol. 1(8). – P. 185-191.

29. Rakhmonovna, S. Z., & Sharipovna, A. N. (2020). Characteristics of exchange of essential microelements of copper and zinc in healthy fertilized women and women with combined copper and zinc deficiency state. *European Journal of Molecular & Clinical Medicine*, 7(1), 3332-3335.
30. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. The Significance of Immunohistochemical Markers in the Treatment of Breast Cancer // *International journal on orange technology*. – 2021. – Vol. 03(9). – P. 69-72.
31. Nurov Jamshid Raxmatovich, Ahmadova Maftuna Amin qizi. Features of Anatomy of the Greater Omentum // *International journal on orange technology*. – 2021. – Vol. 03(9). – P. 66-68.
32. Nurov Jamshid Raxmatovich, Narzieva Dilnoza Fakhriddinovna. Immediate Results of Surgical Treatment of Gastric Cancer // *International journal on orange technology*. – 2021. – Vol. 03(9). – P. 62-65.
33. Sokhibova, Z. R., & Turdiyev, M. R. (2021). Some Features Of Laboratory Indicators Of Micro And Macro-Elementary Condition Of The Organism Of Female Age Women Innormality And In Iron Deficiency. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(02), 140-145.
34. G.F.Makhmudova Colposcopic analysis of cervical pathology in women with uterine fibroids//*Scientific progress*// 3(1), 289-296,2022
35. А.У. Нурбобоев, МС Шаропова, А.Ф. Махмудова Турли этиологияли механик сарикликни даволашда замонавий минилапаратом усуллар// *Scientific progress*// 3(1), 713-721, 2022
36. MG Fazliddinova, NA Uygunovich, ND Faxriddinova The modern way of diagnosis of cervical pathology in women with uterine fibroids via the colposcopy//*Web of scientist: international scientific research journal*.-3(02), 1017-1027, 2022.
37. Abdullayev Habibulla Narzulloyevich, Makhmudova Guljamol Fazliddinova, Makhmudova Anora Fazliddinova // Age-related clinical and instrumental analysis of malignant tumors of the cervix// *Eurasian Medical Research Periodical*.-2021 Vol 3, 1-8.
38. AH Narzulloyevich, MG Fazliddinova, KF Sharopovna// Comparison of the results of modern methods of treatment of elderly women with breast cancer// *Eurasian Medical Research Periodical* 3, 9-15.