Modern Journal of Social Sciences and Humanities
ISSN: 2795-4846 Vol. 4 (2022)
https://mjssh.academicjournal.io/index.php/mjssh

THE POSSIBILITIES OF USING DIGITAL RADIOGRAPHY IN THE DIAGNOSIS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Jumaeva M. M. Akhmadova M. A.
Bukhara State Medical Institute Bukhara branch of the Republican Scientific Center of Emergency Medical Care

Annotation: COPD is a common, preventable and treatable chronic lung disease that affects both men and women around the world. Chronic obstructive pulmonary disease (COPD) is an independent disease characterized by a partially irreversible restriction of the passage of air flow in the respiratory tract, which, as a rule, is steadily progressive and provoked by an abnormal inflammatory reaction of lung tissue to irritation by various pathogenic particles and gases. The results of clinical observations of these patients are presented. The possibilities of methods of radiation diagnostics in this category of patients are considered and shown. Early diagnosis of chronic obstructive pulmonary disease (COPD) has a significant impact on the subsequent development of the disease, since the subsequent development of COPD leads to a steady progression of the disease.The article illustrates a variability of the pathological process and its complications in the presence of a single or multiple foreign bodies. Timely diagnostics of chronic obstructive pulmonary disease (COPD) has a significant effect on its course as each subsequent COPD exacerbation inexorably leads to disease progression. The goal of the research was to determine the efficacy of digital radiography in terms of COPD diagnostics. Results of clinic and diagnostic and beam research of 250 patients (140 males and 110 females aged 32 to 70 with the average age of 48.5 ± 7.2 years) with COPD of various severity. Radiographic images were assessed using six main attributes by three expert radiologists. The sensitivity, specificity, and accuracy of the methods compared were determined. Digital radiography may act as a standalone tool for early detection of COPD of various severity.

Keywords: COPD, digital radiography.

Introduction. COPD (chronic obstructive pulmonary disease) is a disease characterized by an incompletely reversible restriction of airflow. This limitation usually progresses and is associated with a pathological reaction of the lungs to harmful particles and gases. Chronic obstructive pulmonary disease (COPD) is one of the most important problems of modern health care worldwide. Its prevalence is constantly growing. COPD ranks 4th in terms of mortality and is the only disease whose mortality rate continues to increase. [1-3].

Timely visualization of lung diseases is impossible without the use of ionizing radiation sources, but their undoubted diagnostic effectiveness is inextricably linked with the adverse effects on a living organism [4]. First of all, this applies to X-ray radiation used in medical diagnostics, which is the most significant source of exposure to ionizing radiation on the population [5].

The preferred method for the initial examination of patients with COPD is standard chest X-ray in the anterior straight and right lateral projections with the vertical position of the patient. Digital lung radiography has become increasingly widespread in recent years. Its advantage is the standard high image quality, which does not depend on the features of the photochemical film wrapping. Digital images have a much wider dynamic range, allowing simultaneous analysis of both lung tissue and dense mediastinal structures. Such images can be additionally processed using mathematical programs,

which in some cases allows us to identify new symptoms [6]. In the presence of clinical indications or questionable results of radiography, computed tomography of the lungs can be performed [7-9].

The purpose of the study. The effectiveness of the digital radiography method in patients with COPD of varying severity has been studied.

Materials and methods. The materials are collected from the medical history of patients of the therapeutic department of the Bukhara branch of the Republican Scientific Center for Emergency Medical Care (BB RSCEMC) with a diagnosis of COPD with varying degrees, static treatments and the criterion of reliability of the difference in indicators.

To evaluate the effectiveness of digital chest radiography in the diagnosis of chronic obstructive pulmonary disease, we examined 250 patients (140 men and 110 women aged 32 to 70 years, average age — 48.5 ± 7.2 years) with a clinically verified diagnosis of chronic obstructive pulmonary disease. Taking into account the low values of the radiation load during the study on a radiographic apparatus with a digital set-top box, a standard radiographic examination was carried out in parallel to all the subjects. High-resolution computed tomography was used as a reference method.

The obtained digital X-ray images and traditional chest radiographs in patients with COPD of varying severity were evaluated according to four main signs: 1) vascular pattern intensity (intensified, accentuated or deformed); 2) bronchial wall thickening (tram tracks); 3) the state of the pulmonary fields (emphysema); 4) changes in the roots of the lungs (compaction, deformation). The images were evaluated independently by three expert radiologists, followed by determination of the sensitivity, specificity and accuracy of the compared methods.

Results and discussion. Based on the data obtained, a comparative assessment of the diagnostic effectiveness of traditional screen-film radiography and digital radiography was carried out for each feature separately and in combination. The sensitivity, specificity and accuracy of the methods were evaluated (Table 1).

Table 1. Determination of the diagnostic effectiveness of screen-film and digital radiography in patients with COPD (%)

Padiological symptoms of COPD	Film-screen radiography			Digital radiography		
	Sensitivity	**Specificity**	**Accuracy**	**Sensitivity**	**Specificity**	**Accuracy**
Increase in pulmonary field translucency	0.88	1.0	0.99	1.0	1.0	1.0
Intensification and deformation pulmonary pattern	0.72	1.0	0.99	0.99	1.0	1.0
Tram tracks symptom	1.0	1.0	0.99	1.0	1.0	1.0
Changes in pulmonary roots	1.0	1.0	0.99	1.0	1.0	1.0

As follows from Table 1, on average, with the equally high specificity of both methods, the sensitivity of digital radiography was higher by 14% compared to traditional radiography ($p < 0.05$).

Thus, the method of digital chest radiography can be used instead of traditional screen-film radiography for early diagnosis of chronic obstructive disease lungs, as it has a higher sensitivity and less radiation load on the patient.

The results obtained can be explained by the fact that digital radiography has a higher resolution, a wide dynamic range, as well as the possibility of a detailed quantitative assessment of the state of the

pulmonary parenchyma in patients with chronic obstructive pulmonary disease, which is consistent with the literature data on the advantages of digital radiological systems [3].

Conclusion. A comparative analysis of the effectiveness of digital radiography and traditional screen-film radiography in the diagnosis of chronic obstructive pulmonary disease of varying severity showed that with equally high specificity of methods, the sensitivity of digital radiography was 14% ($p < 0.05$) higher compared to traditional radiography, which was confirmed by high-resolution computed tomography data.

Thus, digital radiography can serve as an independent tool for early diagnosis of chronic obstructive pulmonary disease with a reduction in the dose load on the patient.

References

1. Chuchalin A.G. (2004). Topical problems of pulmonology. Russian Medical Journal, 12, 2, 53–58. In Russ.
2. Avdeev S.N. (2007). COPD as a systemic disease. Pulmonology, 2, 104–117.
3. Avdeev S.N. (2009). Modern approaches to diagnostics and therapy of pulmonary hypertension in patients wih chronic obstructive pulmonary disease. Pulmonology, 1, 90–101. In Russ.
4. Kal'nitskii S.A., Zvonova I.A. (2011). Present medical exposure levels in population. In L.A. Tyutin (Ed.). Neva Radiological Forum 2011 (pp. 102–103). St. Petersburg: ELBI-SPb. In Russ.
5. Baru S.E. (2010). Radiographic systems with extremely low radiation doses and their fields of application. In Proceedings of Ist Congress of Radiologists of Siberian Federal District (pp. 27–29). Novosibirsk. In Russ.
6. Emel'yanov A.V. (2005). Diagnostics and treatment of chronic obstructive pulmonary disease exacerbations. Russian Medical Journal, 13, 4, 183–189. In Russ.
7. Gorbunov N.A., Sidorova L.D., Laptev V.Ya. (2012). Low-dose digital fluorography for early diagnosis of chronic obstructive pulmonary disease exacerbations. Bulletin Physiology and Pathology of Respiration, 43, 44–47.
8. Ratobyl'skii G.V. (2013). Light-dose high-resolution digital radiography (photofluorography) for detection and diagnostics of pathology of organs and systems at the outpatient level. Polyclinic, 3, 15–17. In Russ.
9. Lishmanov Yu.B., Krivonogov N.G., Agyeva T.S., Dubodelova A.V. (2012). Main scintigraphic parameters in patients with chronic obstructive pulmonary disease. Bulletin of Siberian Medicine, 5, 132–135.
10. М.М. Жумаева ДИАГНОСТИКА ЗАБОЛЕВАНИЙЩИТОВИДНОЙ ЖЕЛЕЗЫ ПРИ ПОМОЩИ УЛЬТРАЗВУКОВОГО ИСЛЕДОВАНИЯ. // БАРҚАРОРЛИК ВА ЕТАКЧИ ТАДҚИҚОТЛАР ОНЛАЙН ИЛМИЙ ЖУРНАЛИ 2 (2), 194-198, 2022
11. A.T.Cho'liyev.,U.S.Mamedov.,M.A.Akhmadova.,R.R.Navro'zov.,D.F.Narziyeva Diagnostics of exinococcosis in youth at the modern stage./Journal of Natural Remedies.2021,№1(1).-P37-40
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. Абдулхакимов Шерзод Алишер огли. Сексуальная восстановление пациентов после контактной лучевой терапии по поводу ограниченного рака простаты. – 2021. - Central asian journal of medical and natural sciences. – 2021. - Vol.2 (5). – P.449-455

15. Iskandarova Iroda Mashrabovna. Relapses of Differentiated Thyroid Cancer // EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS) ISSN 2660-9630.-www.ejlss.indexedresearch.org Volume 7, 2021 ||.-С. 70-75.
16. Шерзод Алишер огли Абдулхакимов, Муножат Хаятовна Исмаилова. Современные тенденции лучевой диагностики при очаговых поражениях печени. Современная медицина: новые подходы и актуальные исследования. Сборник статей по материалам VIII международной научно-практической конференции . 2018. Стр. 29-32
17. Махмудова Г. Ф., Темирова, Д. В., &Баротова, Ш. Б. (2021). Бачадон бўйни хавфли ўсмаларининг ёшга хосхусусиятлари//Academic research ineducational sciences // 2(5).-Б.-186-196. https://doi.org/10.24411/2181-1385-202100871
18. Maxmudova G.F.,Soxibova Z.R., Mamedov U.S., Nurboboyev A.U. Fertil va keksa yoshli ayollarda bachadon bo'yni xavfli o'smalari tahlili (Buxoro viloyatida)//Oriental Renaissance: Innovative, educational, natural and social sciences//-2021.-V 8.-B. 175-184.
19. Nurboboyev A.U., Makhmudova G.F. Miniinvazive approach in the complex treatment of tumor and stone etiology of mechanical jaundice// International journal on Orange technology// Vol 3. Issue 9. Sep.2021.-P. 85-90
20. 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
21. М.А. Ахмадова, А.Т. Чўлиев, Ж.Р. Нуров, Д.К. Худойбердиев Лучевая диагностика эхинококкоза печени./Биология ва тиббиёт муаммолари.2019,№4.2(115)с.20-25
22. Сохибова З.Р.,Ахмадова М.А. Комплексная диагностика и хирургическое и хирургическое лечение осложненных форм эхинококкоза печени.

    /OrientalRenaissance:Innovative,Educational, naturalandsocialsciences/2021й -стр 203-212.
23. НарзиеваД.Ф.Значение Иммуногистохимических маркеров при метастазировании рака молочной железы в легкие.// Oriental Renaissance:Innovtive,educational,natural and social sciences.// -2021 Vol.1-С.170-175
24. Xalikova Feruza. Current concepts of breast cancer risk factors//International journal of philosophical studies and social sciences//2021.- Vol 1.-P.57-66.
25. 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.
26. Mamedov U.S., Pulatova D.SH. The Results of Cancer Treatment of the Oral Caviti Tumors in //the Republic of Uzbekistan European journal of Pharmaceutical and Medical Research. -2019. - 6(9). - P. 326-329.
27. 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
28. 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.
29. 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.

30. 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)
31. 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
32. Гафур Нормуродович Саидов, Учкун Гафурович Абдукаримов, Гулжамол Фазлиддиновна Махмудова. Эпидемиологические показатели первично-множественных опухолей (обзор литературы)// Биология и интегративная медицина// 2019№ 11 (39).-С.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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.
38. *Khalikova Feruza Sharofovna, Abdullaev Khabibullo Narzullayevich.* Early Diagnosis and Treatment of Gastric Cancer in Modern Oncology // Journal of Innovations in Social Sciences *Volume: 01 Issue: 04 | 2021 –*С. 46-50.
39. Axmedov Farxod Xakimovich// CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES// Морфологические Изменения Внутри И Внепеченочных Протоков, И Сфинктеров У Больных С Желчекаменной Болезнью, Постхолецистэктомии. Volume: 02 Issue: 05 | Sep-Oct 2021
40. Xudoyberdiyev Dilshod Karimovich CHARACTERISTICS OF MORPHOMETRIC PARAMETERS OF THE WHITE RAT'S STOMACH IN THE EARLY POSTNATAL PERIOD// Тиббиётда янги кун// 2 (34/3) 2021 С-17-23
41. Xudoyberdiyev Dilshod Karimovich МОРФОЛОГИЧЕСКИЕ И МОРФОМЕТРИЧЕСКИЕ ИЗМЕНЕНИЯ СТЕНКИ ЖЕЛУДКА ОДНОМЕСЯЧНЫХ БЕЛЫХ КРЫС// INTERDISCIPLINARY RESEARCH: SCIENTIFIC HORIZONS AND PERSPECTIVES International Scientific and Theoretical Conference// March 12, 2021 С 57-61
42. Axmedov Farxod Xakimovich SCIENTIFIC COLLECTION «INTERCONF» COMPARATIVE MORPHOMETRY OF INTRA AND EXTRAHEPATIC BILIARY TRACT, BILIARY SPHINCTERS IN PATIENTS WITH CHOLELITHIASIS WHO UNDERWENT CLASSICAL AND LAPAROSCOPIC CHOLECYSTECTOMY № 78 | October, 2021 P-325-327