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Morphological Changes in Lungs Caused by Chemotherapy in Breast Cancer

Shomurodova M. R.
Bukhara State Medical Institute

Abstract: The most important function of the lungs is gas exchange, taking in air enriched with oxygen and exhaling air saturated with carbon dioxide due to the active movements of the chest and diaphragm, as well as the contractility of the lungs. But these functions of the lungs can be disturbed as a result of many factors. For example: Chemotherapy is a chemical method, it is a method of treatment with drugs that have an effect against malignant tumors. The drugs used in chemotherapy are in the lungs. brings about various changes. Lung injury during chemotherapy is one of the most urgent problems of oncology in cancer patients. Cancer therapy should be accompanied by appropriate evaluation and management, even in patients with lung failure who have cancer. Timely and successful prevention and treatment of tumor-related lung pathologies is aimed at preserving the structure and function of the lungs, as well as improving the quality of vital processes.

The purpose of the work: to study the morphological changes in the lungs caused by chemotherapy in breast cancer.

Keywords: chemotherapy, lung, cancer, mammary gland, morphology.

The urgency of the problem. According to the World Health Organization, more than 10 million new cases of breast cancer are reported every year. According to statistics, breast cancer ranks first among women's dangerous diseases. Oncopathologies occur in 16% of all types of cancer. Chemotherapy is a chemical method, a method of treatment with drugs that act against malignant tumors. The drugs used in chemotherapy cause various changes in the lungs. Cancer therapy should be accompanied by appropriate evaluation and management, even in patients with lung failure who have cancer. Chemotherapy is one of the main treatment methods in oncology. The mechanisms of action of chemotherapy drugs are different, but they are all based on one principle: the drugs damage and destroy rapidly multiplying cancer cells.

Because chemotherapy drugs are often administered intravenously, they spread throughout the body, targeting not only tumor cells but also healthy, actively dividing cells, particularly hair follicles, red bone marrow, and mucous membranes (mouth, digestive system, reproductive system) attacks.). It causes side effects. Some chemotherapy drugs can damage the heart, kidneys, bladder, nervous system and lung cells [Pylev A.L., 2022]

Pulmonary fibrosis is a pathological process characterized by the replacement of normal lung tissue with fibrous (scar) tissue. As a result of such changes, serious disorders of the respiratory system occur. The development of fibrosis leads to a decrease in the working volume of lung tissue, as a result of which lung ventilation and respiratory efficiency decrease. The process can develop in one or both lungs, it is divided into unilateral and bilateral depending on the pathology.

Material and methods. 250 white outbred female rats were used as the research object in 6-month-old normal vivarium conditions. In experimental groups, mammary cancer was induced in rats through the carcinogen 7,12-dimethylbenzanthracene. A 68.9% success rate was achieved, i.e., 145 rat mammary cancers were induced by subcutaneous injection of the carcinogen 7,12-dimethylbenzanthracene at a dose of 0.1 mg in the breast of 210 female rats. All laboratory animals were divided into 10 groups.

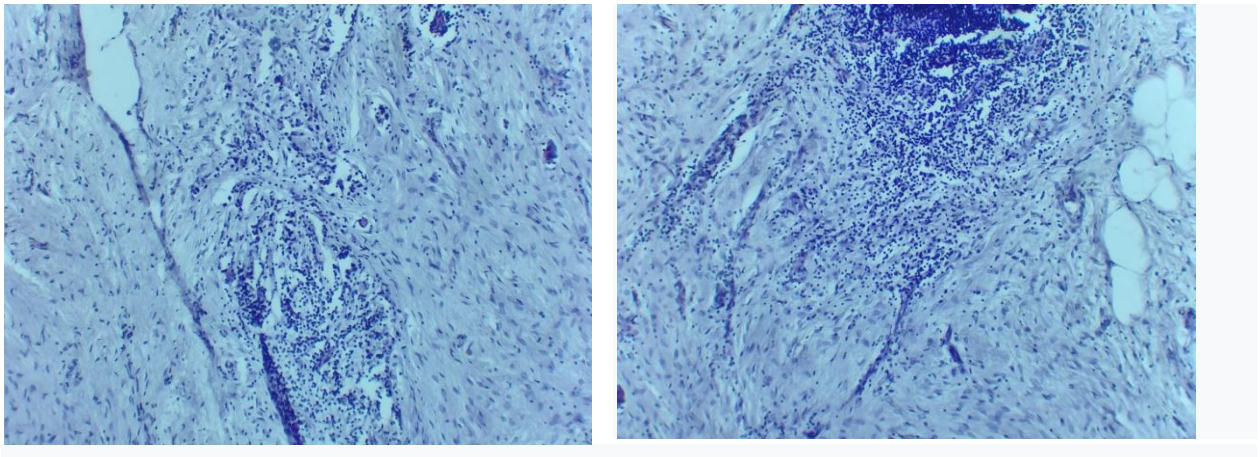
The following methods are used:

- staining microslides with hematoxylin-eosin
- Staining of microslides according to Van Gieson
- immunohistochemical staining of micropreparations
- Method of variation statistics using Strelkov tables and Student's t-test determination

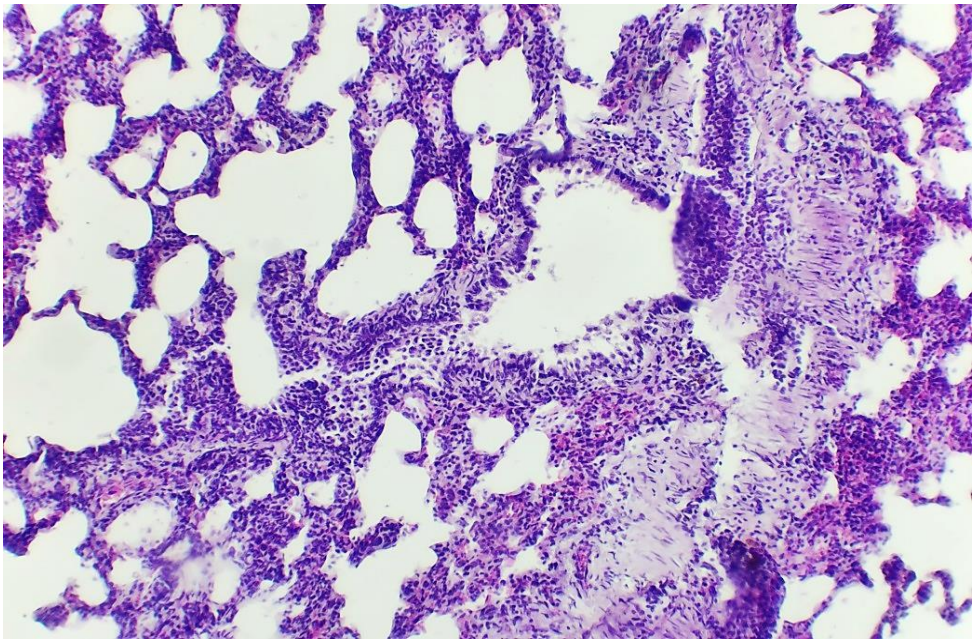
Results and conclusions. 250 white outbred female rats were used in 6-month-old normal vivarium conditions. In experimental groups, mammary cancer was induced in rats through the carcinogen 7,12-dimethylbenzanthracene. A 68.9% success rate was achieved, i.e., 145 rat mammary cancers were induced by subcutaneous injection of the carcinogen 7,12-dimethylbenzanthracene at a dose of 0.1 mg in the breast of 210 female rats.

All laboratory animals were divided into 10 groups: Group 1 - healthy experimental animals in standard vivarium conditions; Group 2 - 0.7 ml of distilled water was administered intragastrically through a gastric metal probe to rats with cancer for 21 days, and cisplatin was administered intravenously at a dose of 0.4 mg/kg on the 11th day; Group 3 - 0.7 ml of distilled water was administered intragastrically through a gastric metal probe to rats suffering from cancer for 21 days, and on the 11th day, a dose of 0.2 mg/kg was administered intravenously; Group 4 rats with cancer were intragastrically injected with 0.7 ml of pomegranate seed oil through a gastric metal probe for 21 days, and on the 11th day, cisplatin drug was injected intravenously at a dose of 0.4 mg/kg; Group 5 - rats with cancer were intragastrically injected with 0.7 ml of pomegranate seed oil through a gastric metal probe for 21 days, and on the 11th day, paclitaxel was injected intravenously at a dose of 0.2 mg/kg;

Group 6 - rats with cancer were intragastrically injected with 0.7 ml of pomegranate seed oil through a gastric metal tube for 21 days, and on the 11th day, cisplatin at a dose of 0.4 mg/kg and cisplatin at a dose of 0.4 mg/kg were administered intravenously. Paclitaxel was administered at a dose of 2 mg/kg; Group 7 - rats with cancer were treated with intravenous cisplatin at a dose of 0.4 mg/kg and received 0.7 ml of pomegranate seed oil intragastrically through a gastric metal tube for 11 days and at the same time conventional conservative treatment after chemotherapy carried out; Group 8 - cancer rats were injected intravenously with poclitoxel at a dose of 0.2 mg/kg and received 0.7 ml of pomegranate seed oil intragastrically through a gastric metal tube for 11 days, and at the same time, conventional conservative treatment after chemotherapy carried out; Group 9 - cisplatin drug was administered intravenously at a dose of 0.4 mg/kg to rats with cancer and conventional conservative treatment after chemotherapy was carried out for 11 days; Group 10 - rats with cancer were injected intravenously with poclitoxel at a dose of 0.2 mg/kg and received traditional conservative treatment after chemotherapy for 11 days.



Picture1. Cancer cells in the mammary gland of a 6-month-old white outbred rat



Picture 2. Lung tissue. Morphological changes in lungs as a result of chemotherapy. Expansion of alveolar barriers (1), growth of myofibroblastic cells (2), fullness of blood vessels (3), significant infiltration process in the bronchial wall (4). Dye hematoxylin-eosin. Floor: 40x20.

When microscopic preparations were prepared from the lung tissues of all the non-white rats belonging to the first main group, it was found that various morphological changes were observed under the microscope. Lung tissue was examined macroscopically and microscopically. In it, the lung tissue is light-red in color, the surface is shiny, and when the tissue is squeezed by hand, a bubbly liquid is released from inside, which indicates lung edema. When the lung tissue is cut, small hemorrhages are detected in some places. Some areas of the tissue are slightly hardened, fibrous tissue of liquid color is detected. In the microscopic view, the alveolar space in the lung tissue is enlarged, some alveolar walls are cracked, signs of focal atelectasis, blood vessel fullness, rare inflammation in the walls of the bronchus and bronchioles. processes, the growth of myofibroblastic tissue in the interstitial tissue was detected (pic. 2)

Literature

1. Shomurodova Mukhayo Rakhmonovna, (May 6, 2023). Morphological Features and Morphometric Parameters of the Lungs after Correction with an Immunomodulator Under the Conditions of Experimental Chemotherapy. Journal of Natural and Medical Education (pp. 55-60).

2. Shomurodova Mukhayo Rakhmonovna, (05 2023) Mastopatiya. Yosh Patmorfolog Nigohida. Amaliy va tibbiyot fanlari ilmiy jurnali (193-197) https://sciencebox.uz
3. Shomurodova Muxayyo Raxmonovna (05 2023) Morfometricheskie Pokazateli Legkix Posle Korreksii Immunomodulyatorom V Usloviyax Eksperimentalnoy Ximioterapii Amaliy va tibbiyot fanlari ilmiy jurnali (198-202) https://sciencebox.uz
4. Айтбаев Кубаныч Авенович, Муркамилов Илхом Торобекович, Фомин Виктор Викторович, Кудайбергенова Индира Орозобаевна, Муркамилова Жамила Абдилалимовна, Юсупов Фуркат Абдулахатович ЛЕГОЧНЫЙ ФИБРОЗ КАК ПОСЛЕДСТВИЕ ПАНДЕМИИ COVID-19 // Бюллетен науки и практики. 2021. №5. URL: https://cyberleninka.ru/article/n/legochnyy-fibroz-kak-posledstvie-pandemii-covid-19 (дата обращения: 29.07.2022).
5. Белевский А.С., Визел А.А., Зырянов С.К., Игнатова Г.Л., Колбин А.С., Лещенко И.В., Титова О.Н., Фролов М.Ю. Хроническая обструктивная болезн легких: проблемы сегодняшнего дня // Практическая пулмонология. 2015. №3. URL: https://cyberleninka.ru/article/n/hronicheskaya-obstruktivnaya-bolezn-legkih-problemy-segodnyashnego-dnya (дата обращения: 29.11.2022).
6. Бондарев О.И., Бугаева М.С., Михайлова Н.Н., Филимонов С.Н. ОСОБЕННОСТИ СТРУКТУРНОЙ ДЕЗОРГАНИЗАТSIИ КОЛЛАГЕНА КАК ПУСКОВОГО МЕХАНИЗМА ПНЕВМОСКЛЕРОЗА У ШАХТЕРОВ // Мед. труда и пром. экол.. 2018. №6. URL: https://cyberleninka.ru/article/n/osobennosti-strukturnoy-dezorganizatsii-kollagena-kak-puskovogo-mehanizma-pnevmoskleroza-u-shahterov (дата обращения: 29.11.2022).
7. Ташметова Г.Т., Ливерко И.В. Хроническая обструктивная болезн легких в организованных коллективах. *Туберкулез и болезни легких*. 2020;98(6):36-39.
8. Андреева Е. А., Кузнецова О. Ю., Похазникова М. А. Ранняя диагностика хронической обструктивной болезни легких - миф или реалност? // Вестник Санкт-Петербургской академии последипломного образования. - 2011. - № 4. - С. 136-140.
9. Захарова И. А. Хронические неспецифические заболевания легких у лиц молодого возраста. Распространенност, особенности клинико-функционалного статуса и качества жизни: Автореф. дис. … д-ра мед. наук. - 2017. - 47 с.
10. Карнаушкина М. А., Овсянников Д. Ю., Бойцова Е. В., Малявин А. Г. Хроническая обструктивная болезн легких: возможный исход бронхолегочной дисплазии // Доктор.ру. - 2014. - № 2. - С. 10-16.
11. Кароматов И.Д., Набиева З.Т., Ганиев Р.М. Плоды гранатов в профилактике и лечении сахарного диабета и сердечнососудистых заболеваний //Биология и интегративная медицина 2018, 2(19), 91-100.
12. Окатева В.Е., Малцева Е.М. Влияние концентратsiи этанола на антиоксидантную активност извлечений из перикарпия плода граната обыкновенного (Punica Granatum L.) - // Международный студенческий научный вестник 2018, 4-4, 678-680.
13. Позднякова О. Ю., Батурин В. А. Особенности клинических проявлений хронической обструктивной болезни легких в зависимости от возраста // Медицинский вестник Северного Кавказа. - 2011. - № 11. - С. 7-9.