BRITISH MEDICAL JOURNAL

British Medical Journal Volume-1, No 2
10.5281/zenodo.5507331
British Medical Journal
Volume 1, No 2., 2021
Internet address: http://ejournals.id/index.php/bmj
E-mail: info@ejournals.id
Published by British Medical Journal
Issued Bimonthly
3 knoll drive. London. N14 5LU United Kingdom
+44 7542 987055
Chief Editor
Dr. Fiona Egea

Requirements for the authors.
The manuscript authors must provide reliable results of the work done, as well as an objective judgment on the significance of the study. The data underlying the work should be presented accurately, without errors. The work should contain enough details and bibliographic references for possible reproduction. False or knowingly erroneous statements are perceived as unethical behavior and unacceptable.
Authors should make sure that the original work is submitted and, if other authors' works or claims are used, provide appropriate bibliographic references or citations. Plagiarism can exist in many forms - from representing someone else's work as copyright to copying or paraphrasing significant parts of another's work without attribution, as well as claiming one's rights to the results of another's research. Plagiarism in all forms constitutes unethical acts and is unacceptable. Responsibility for plagiarism is entirely on the shoulders of the authors.
Significant errors in published works. If the author detects significant errors or inaccuracies in the publication, the author must inform the editor of the journal or the publisher about this and interact with them in order to remove the publication as soon as possible or correct errors. If the editor or publisher has received information from a third party that the publication contains significant errors, the author must withdraw the work or correct the errors as soon as possible.

British Medical Journal Volume-1, No 2
10.5281/zenodo.5507331

MODERN CONCEPT OF CLINIC AND DIAGNOSIS OF CARDIOVASCULAR COMPLICATIONS OF ANTICANCER THERAPY

Ergashov Bobir Bahodirovich, Makhmudov Ravshan Barraevich, Qayumov Laziz Kholmurodovich
Bukhara state medical institute, Bukhara, Uzbekistan

Abstract. The given review is devoted to the problem of the cardiotoxicity of chemotherapeutic agents. Many of chemotherapeutic agents can cause cardiovascular complications such as left ventricular dysfunction and heart failure development, myocardial ischemia, arterial hypertension, thromboembolism, QT prolongation and arrhythmias. The toxic influence of the most often used chemotherapeutic agents on heart (such as antimetabolites, alkylating agents, platinum compounds, taxanes, vinca alkaloids, monoclonal antibodies, anthracycline antibiotics, topoisomerase and protein kinase inhibitors, immunomodulatory agents and cytokines) has been described. The results of recent studies on etiology, pathogenesis and clinical features of chemotherapy-induced cardiotoxicity were present in the first part of review. The clinical features, diagnosis, treatment and prevention of the cardiotoxicity of chemotherapeutic agents, are described in the second part of the review

Keywords: chemotherapy; cardiotoxicity; pathogenesis; drug-induced cardiomyopathy.

Clinical symptoms

The manifestations of cardiotoxicity (CT) are very variable and can be observed both on the first day of taking the drug, and decades after the start of treatment. In patients receiving therapy with antimetabolites, taxanes, monoclonal antibodies and protease inhibitors, CT can manifest as acute coronary syndrome (ACS) (intense chest pain of a pressing, compressing or burning character, often radiating to the left arm, lower jaw, severe weakness and pallor , difficulty breathing, sweating, etc.) [1–4]. A number of patients on the background of chemotherapy (CT) develop various rhythm and conduction disturbances, including life-threatening variants [1].

Inhibitors of tyrosine kinases and anthracyclines are capable of prolonging the Q-T interval. The duration of the Q-T interval and the risk factors contributing to its lengthening should be monitored before, during and after the course of treatment, since prolongation of the Q-T interval is associated with the risk of life-threatening tachyarrhythmias and sudden cardiac death [4]. The risk of lengthening the Q-T interval varies for different drugs, this is especially true in the case of using arsenic trioxide (when using it, Q-T interval lengthening is observed in 26–93% of cases) [1, 5].

Against the background of therapy with sorafenib and immunomodulatory agents, venous thromboembolic complications (VTO) may develop with an appropriate clinical picture depending on the localization of the process.

The use of anthracycline antibiotics very often leads to the development of left ventricular (LV) dysfunction and / or severe heart failure (HF) with a corresponding clinical picture [5, 6].

10.5281/zenodo.5507331

Screening, monitoring and diagnosis of cardiotoxicity

CT diagnostic methods in accordance with the recommendations of the European Association of Cardiology (ESC) 2016 are presented in table. 3 [1].

According to the recommendations of the European Society of Medical Oncology (ESMO) [7] and the European Society of Cardiology (ESC) [1], mandatory monitoring of the state of the cardiovascular system is required before and during chemotherapy, including instrumental and laboratory research methods.

Instrumental research methods:

• ECG - must be performed without fail before starting chemotherapy in order to identify possible initially existing rhythm disturbances, conduction, lengthening of the Q-T interval [1, 7];

• echocardiography (EchoCG) is the most common and accessible method for assessing systolic (LV shortening fraction and LV ejection fraction (EF)) and diastolic (transmitral diastolic flow, the ratio of the rate of early diastolic filling of the ventricles to the rate of their late diastolic filling (atrial systole) (E / A), an estimate of the time of deceleration of the peak E and isovolumetric relaxation) of the function. Echocardiography should be performed without fail in all patients before starting therapy with trastuzumab and anthracyclines. A decrease in LVEF by more than 10% of the lower limit of the norm, determined at the level of 53%, suggests CT [8];

• speckle-tracking EchoCG - a technique for evaluating an ultrasound image, which makes it possible to assess the displacement, speed of movement, deformation and deformation rate of any part of the myocardium that falls within the scanning sector. It is one of the most sensitive methods for early detection of heart pathology. There is evidence that already a month after treatment with anthracyclines by this method, significant deterioration in the indices of torsion, the rate of torsion, and unwinding is revealed, although changes in the size of the cavity and LVEF are usually not detected. The most significant among all indicators is the longitudinal deformation index (GLS), a decrease in which by more than 15% from the norm is a criterion for the development of CT [3];

• Multiportal radionuclide angiography (MRA) is a reliable method for assessing LVEF. A decrease in EF of more than 10% with a value of less than 50% according to MRA indicates the development of CT. However, the use of this method is significantly limited due to radioactive exposure [1, 7];

• Magnetic resonance imaging (MRI) is used to assess myocardial function, perfusion and tissue health, but it is not an ideal method for initial screening. As a rule, it is used when it is impossible to perform other methods or their lack of information content [1, 7];

• endomyocardial biopsy is the "gold standard" of CT diagnostics, but in general clinical practice it is used extremely rarely due to the limited equipment of medical institutions, the invasiveness of the procedure and the lack of appropriate skills of medical personnel [7].

Laboratory research methods

10.5281/zenodo.5507331

Currently, the strategy of interpreting changes in the levels of cardiac biomarkers has not yet been proven to be effective in preventing or improving the prognosis of long-term events associated with CT. However, it should be noted that an increase in the levels of cardiac biomarkers makes it possible to identify patients with a high risk of CT, for whom it may be advisable to prescribe prophylactic measures [9–11, 12]. Despite the obvious lack of objective information on the use of cardiac troponins for CT diagnosis and the relative high cost of the technique, the current recommendations of ESMO, ESC and the Russian Society of Clinical Oncology (RUSSCO) provide for the use of troponin tests in patients with CT risk factors, especially when treated with anthracyclines [1, 7, 13].

Timing of examination of patients receiving cardiotoxic chemotherapy

• When treating with anthracyclines and trastuzumab, monitoring of the function of the cardiovascular system should be carried out before starting therapy and then after 3, 6, 9, 12, 18 months. More frequent monitoring is possible according to clinical indications [7, 10, 14].

• When prescribing anthracycline-containing courses in a patient with an initially high risk of CT, an early assessment of cardiac activity (EchoCG) should be performed after reaching a cumulative dose of 240 mg / m2 doxorubicin (or equivalent other drugs) [7, 16]. With a decrease in LVEF by 15% or more from the initial value (provided that the value of the indicator is equal to or more than 50%), anthracyclines therapy can be continued under the supervision of a cardiologist and with regular monitoring of cardiac function [7, 11, 15]. With a decrease in LVEF below 50%, re-evaluation by echocardiography is recommended after 3 weeks. If the EF value is confirmed below 50%, chemotherapy is temporarily stopped, and cardiac therapy is performed. With a decrease in LVEF below 40%, the cessation of the prescribed chemotherapy regimen, cardiac therapy and discussion of an alternative treatment strategy are indicated [1, 7, 11, 17, 20].

• Evaluation of cardiovascular function is recommended 4 years and 10 years after anthracyclines therapy in patients under 15 years of age and in patients over 15 years of age if the cumulative dose of doxorubicin exceeds 240 mg / m2, and the dose of epirubicin is 360 mg / m2 [11, 18, 21, 24].

• Assessment of the level of at least one cardiac biomarker - highly sensitive troponins (I or T) or natriuretic peptide B-type (NP-B) is recommended before starting chemotherapy. Determination of highly sensitive troponin I in patients with risk factors for the development of CT is recommended after each course of anthracycline-containing chemotherapy [1, 7, 11, 19, 22].

In addition to the traditionally used biomarkers (troponins, NUP-B), special attention has recently been paid to the study of additional markers of cardiac damage, oxidative stress, and other pathological processes activated during the development of CT, caused by the intake of chemotherapeutic drugs. In particular, the role of myeloperoxidase, an enzyme involved in lipid peroxidation (LPO) and released during periods of inflammatory oxidative stress by neutrophils, is being studied. In addition, attention is paid to growth / differentiation factor 15 (GDF-15),

10.5281/zenodo.5507331
phosphatidylinositol glycan biosynthesis class F protein (PIGF), soluble receptor FMS-like tyrosine kinase 1 (sFlt-1), galectin 3, etc. [2, 23, 25].

Conclusion. Thus, CT is an important problem affecting many aspects of oncology, hematology and cardiology. And, despite certain achievements, today there are many unresolved issues related to its diagnosis, prevention and treatment. It is hoped that future research on CT chemotherapy can not only expand the body's tolerance to special treatments, but also increase their effectiveness without developing serious side effects.

References

1. Ergashov B.B. Treatment and prevention of arrhythmias associated with anticancer therapy // Asian journal of Pharmaceutical and biological research Volume 10 Issue 2 MAY-AUG 2021. P. 47-54.
2. Ergashov B.B. A causal relationship of anticancer drugs with specific arrhythmias // Asian journal of Pharmaceutical and biological research Volume 10 Issue 2 MAY-AUG 2021. P. 55-55.
3. Akhmedova N.Sh., Ergashov B.B., Nuralieva H.O., Safarova G.A. Influence of collected modified risk factors on the development and progression of chronic kidney disease // International Journal of Current Research and Review Vol 13. Issue 02. January 2021 P. 13-17.
4. Makhmudova L.I., Akhmedova N.Sh., Ergashov B.B. Clinical manifestation of irritable bowel syndrome Art of Medicine Volume-1 International Medical Scientific Journal Issue-2 P. 24-33.
5. Abdullaeva U.K. Predicting the risk of atrophic transformation in chronic gastritis using serum pepsinogen // World journal of pharmaceutical research, Faculty of Pharmacy Medical University, Bulgaria, Vol. 8, Iss. 13, 2019, P. 219-228.
6. Abdullaeva U.K., Sobirova G.N., Karimov M.M., Aslonova I.J. The prevalence and possibilities of prevention of noncardial gastric cancer in the Bukhara region // American journal of medicine and medical sciences, 2020, 10(9), P. 679-681.
7. Sobirova G.N., Abdullaeva U.K., Nosirova M.S., Aslonova I.J. Evaluation of the gastrointestinal mucosa by the OLGA system in chronic atrophic gastritis // Journal of critical reviews, Kuala Lumpur, Malaysia, Vol. 7, Iss. 2, 2020, P. 409-413.
8. Karimov M.M., Sobirova G.N., Abdullaeva U.K., Aslonova I.Zh., Tulyaganova F.M. Possibilities of serological diagnosis of atrophic processes of the gastric mucosa // European Journal of Molecular & Clinical Medicine Vol. 7, Iss. 11, 2020, P. 2955-2960.
9. Karimov M.M., Sobirova G.N., Abdullaeva U.K. Chronic gastritis and carcinogenesis issues // Herald of Pancreatic Club, 45 (4). P. 65-70. (in Russian)
10. Abdullaeva U.K. Predicting the risk of atrophic transformation in chronic gastritis using serum pepsinogen // World journal of pharmaceutical research, Faculty of Pharmacy Medical University, Bulgaria, 8 (13) P. 219-228.
11. Sobirova G.N., Abdullaeva U.K. Immunopatogenesis of chronic gastritis and its role in carcinogenesis // Journal of Biomedicine and Practice, 1 (4). P. 40-44.
12. Karimov M.M., Sobirova G.N., Abdullaeva U.K., Aslonova I.Zh., Tulyaganova F.M. Possibilities of Serological Diagnosis of Atrophic Processes of the Gastric Mucosa // Annals of the Romanian Society for Cell Biology, , Vol. 25, Issue 1, 2021, Pages. 6168 – 6174.
13. Abdullaeva U.K., Shadjanova N.S. Using the OLGA system in chronic atrophic gastritis // New day in medicine, 2020, №2, P. 9-12.
14. Nurulloyev S.O., Mirzamuradov H.H. Morphological Changes In Bone Tissue In Chronic Osteomyelitis On The Background Of Application Of Plate Concentrate // The American Journal of Medical Sciences and Pharmaceutical Research Volume 3 Issue 04, 2021. P. 160-164.

15. Mirzamurodov H.H. New approaches to treatment of patients with coxovertebral syndrome // Asian journal of Pharmaceutical and biological research. Volume 10 Issue 2 MAY-AUG 2021. P. 9-19
16. Mirzamurodov Kh.Kh., Akhmedov Sh.Sh., Nuruloev S.O., Ziyadullaev A.Kh., Nematov D.A. Optimization of total hip arthroplasty in dysplastic coxarthrosis // New day in medicine. 4 (32) 2020 P. 667-672. (in Russian)
17. Asilova S.U. et al Estimation of the results of treatment of the application of platelet-rich plasma in aseptic necrosis of the femoral head // Polish science journal. 2020. Issue 12(33) Part 2. P. 109-115. (in Russian)
18. Nurullaev S.O., Akhmedov Sh.Sh., Akramov V.R., KhamraevA.Sh., Khamraev B.U., Mirzamurodov Kh.Kh Our experience in the treatment of grade I-II gonarthrosis with hyaluronic acid preparations // ACADEMICIA: An International Multidisciplinary Research Journal. Vol. 10, Issue 12, December 2020. P. 1771-1775.
19. Mirzamurodov H. Kh., Khodzhanov I. Yu., Nurulloev S.O. Complex conservative therapy for hip-spine syndrome // International Scientific and Educational electronic journal "Education and science in the xxi century" 2021. Issue No. 12 (volume 2). P. 1438-1439. (in Russian).
20. Nurulloev S.O., Mirzamuradov Kh.Kh. Our experience in the treatment of degree i-ii gonarthrosis with drugs hyalouranic acid // Innovation in the modern education system. 2021. Part 5, Issue 1. P. 546-548. (in Russian).
21. Khodzhanov I.Yu., Mirzamurodov Kh.Kh. Coxo-vertebral syndrome, diagnosis and treatment // scientific and practical journal "Traumatology, Orthopedics and Rehabilitation". 2021. №1. P. 70-76. (in Uzbek).
22. Safarova G.A. Vasorenal hemodynamic changes in patients with chronic kidney disease in comorbidity with hypertonic disease. Asian journal of Pharmaceutical and biological research Volume 10 Issue 2 MAY-AUG 2021 P. 66-71.
23. Sohibova Z.R., Safarova G.A. Modern concepts about the value of macro- and microelements in physiology and pathology of the body (review). Journal of Biomedicine and Practice 2020, Vol.6, Issue 5, P.238-243.
24. Safarova G.A., Mukhamedzhanova M.Kh. Assessment of vasorenal hemodynamics in patients with chronic kidney disease in association with arterial hypertension // Problems of biology and medicine. 2020, № 6 (124), P. 87-90. (in Russian)
25. Makhmudov R.B., Safarova G.A., Clinical Cases Of Hepatitis-Associated Aplastic Anemia // The American Journal of Medical Sciences and Pharmaceutical Research, 3(04), P. 195-199.