THE ROLE OF CYCLOPHOSPHAMIDE IN THE DEVELOPMENT OF ANTHRACYCLINE CARDIOTOXICITY IN PATIENTS WITH BREAST CANCER

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Introduction. The widespread AC breast cancer (BC) chemotherapy regimen (doxorubicin + cyclophosphamide) reduces disease recurrence by 12% and mortality by 11% and improves other survival rates compared to alternatives. At the same time, specific cardiotoxicity through apoptosis of cardiomyocytes caused by doxorubicin is a serious limitation of its use in practice and is observed in 4.7-48% of patients. This damage is noted already at the initial stage of taking the medicine. There is an opinion about the potentiation of this effect by cyclophosphamide, which in high doses also gives the effect of cardiotoxicity in the inflammatory type of lesion, which is described in detail in the literature for doses 4-5 times higher than those used in BC. This is relevant in terms of preventing cardiotoxicity.

Purpose of the research to investigate the possible role of cyclophosphamide in the effects of cardiotoxicity in patients with locally advanced forms of BC.

Materials and methods. The study of the rheological properties of whole blood and plasma by the laboratory department of Al Hakeem Hospital during chemotherapy of patients according to the AC scheme.

Obtained results. The rheological properties of whole blood and plasma were assessed in blood samples from 77 patients with BC taken at baseline, after the third cycle, and after the end of chemotherapy, including after 6 months. The study was carried out on a Xylem Inc. capillary viscometer (USA) at shear stress in the range of 6.5-13 dyne / cm^2. Initially, the viscosity of whole blood was 4.14 ± 0.16 cP, and of plasma - 2.26 ± 0.09 cP and these values did not change significantly during chemotherapy. Immediately by the end of treatment, they were 4.19 ± 0.17 cP, respectively, and plasma - 2.28 ± 0.12 cP. This indicated the absence of the expected toxic effect of cyclophosphamide on the myocardium in the doses used. Since otherwise, the viscosity of blood due to the accumulation of sequestered blood proteins, including those of an inflammatory nature, would significantly increase these indicators. Primarily due to a decrease in erythrocyte deformation.

Conclusions. According to the study of the viscosity of whole blood and plasma in patients with BC in the course of chemotherapy, no data were revealed regarding the potentiating role of cyclophosphamide in the formation of anthracycline cardiotoxicity.

KEY POINTS OF ANTIBIOTIC RESISTANCE IN LEBANON

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Introduction. The rising level of antibiotic resistance in Lebanon is a huge and complex medical and social problem that subjects many lives at risk in a drastic manner. It has a deep background related to the knowledge of the Lebanese population, attitudes, and practices of antibiotic usage as well as a socio-economic situation. So far, this problem becomes even more important since

the numerous factors leading to the emergence and spread of multi-resistant strains remain uncontrollable today.

Purpose of the research was to make an analytical overview of the antibiotic resistance crisis in Lebanon and to elicit the key strategy points that should be addressed to improve the current situation.

Materials and methods. The overview included the range of relevant literature tackling the factors of antibiotic resistance development in Lebanon, tendencies of antibiotic usage by the Lebanese population, and the role of pharmaceutical care and relevant services.

Obtained results. Overall, the analysis showed a high prevalence of inappropriate antibiotic prescriptions in Lebanon. The first large contributing issue is a behavioral factor of the population towards antibiotics consumption such as time-saving, access without prescription, and the lack of educational awareness. The analyzed studies illustrate that low educational and socioeconomic levels of parents and individuals were identified as factors significantly associated with poor knowledge and misuse. It was shown also that self-medication was significantly higher in men and more common in those with sore throats and unaware of the dangers of using antibiotics. Despite the clear evidence on the limited role of antibiotics in upper respiratory infections, parents in Lebanon continue to misuse them. Amoxicillin/ clavulanic acid (69.7%) was the most prescribed antibiotic that influenced rising antimicrobial resistance in Lebanon. The use of amoxicillin has been debated by pediatricians due to high resistance to the antibiotic. Thus, pediatricians were advised to replace it with an alternative antibiotic. In addition, self-medication was associated with amoxicillin and inversely related to the quinolones, cephalosporins, and other classes of antibiotics.

On the other hand, such a kind of social behavior, as well as medical behavior, has been spread amongst Syrian refugees as they become integrated within the Lebanese territory after the conflict. Syrian refugees living in extreme poverty are provided with some medicines including antibiotics without proper pharmaceutical care and usage control, adequate therapy guidelines as it has been shown for the treatment of malnutrition amongst Syrian refugees where the national Lebanese protocol is lacking.

Therefore, poor social and economic health determinants amongst Syrian refugees, false ideas and inappropriate practices driving self-medication with antibiotics in the general population among buyers of antibiotics in pharmacies are huge influencing factors for the development of local antibiotic resistance crisis in Lebanon that contributes to the global landscape of this up-to-date issue.

Conclusions. All of these results prove the poor awareness amongst the Lebanese society and huge impact on Syrian refugees (especially those diagnosed with malnutrition) constitute the main medical and social issues contributing to antibiotic resistance development in Lebanon. The results of the overview indicate the need for large-scale informational work among the population initiated by the pharmaceutical service and especially addressing vulnerable categories with poor social and economic health determinants and restricted access to proper healthcare. Quality pharmaceutical care must be a cornerstone of the national framework for overriding inadequate antibiotic usage among the Lebanese population covering the proper pharmacist consultations, strict rules for antibacterial medicines prescribing and dispense as well as the control of the therapy process and outcomes.