

TETRACYCLINE ANTIBIOTICS AND METAL SALTS INTERACTION COMPARATIVE STUDY

Dobrova A. O., Golovchenko O. S., Georgiyants V. A.
anna.dobrova08@gmail.com

Introduction. Nowadays in the modern world we can trace constant increase of comorbidity – the presence of several chronic diseases. Therefore a requirement for combination therapy is growing. At the same time number of cases of irrational multiple drug assign is growing. Consequently, drug-drug and food-drug interaction study today is an important task of pharmacy.

Antibiotic tetracycline hydrochloride is often adduced in literary sources as a classic example of interaction with metal cations. At the same time, it is described in literature, that doxycycline hydrochloride doesn't undergo this type of reactions.

Results and discussion. Considering mentioned above, the purpose of our research was comparative study of a probable interaction of tetracycline hydrochloride (TC) and doxycycline hydrochloride (DC) with salts CaCl_2 , MgSO_4 и AlCl_3 , which are constituents of antacids, food and mineral water.

Possible interaction study was carried out by absorption spectrophotometry in the UV-region of the spectrum, by measuring the optical density of the obtained solutions of TC and DC complexes with the appropriate metal salts. The purified water and 0.1M HCl were used as solvents. To reproduce the drug interaction model mixtures were prepared. Metal salts were added in stoichiometric ratios – 2:1 for CaCl_2 and MgSO_4 , and 3:1 for AlCl_3 . All solutions were prepared in a 0.002% concentration.

Analysis of the results was carried out by comparison absorption spectra of solutions TC and DC with metal salts.

In a set of experiments the following results were obtained. In a purified water medium the character of spectra for complexes DC and TC with AlCl_3 was changed, as well as the change in absorbance intensity. For the complexes TC and DC with CaCl_2 and MgSO_4 the character of the spectra was not change, but the change of absorbance intensity was observed.

In a 0.1 M HCl medium for complexes TC and DC in all studies the character of spectra was not changed, but the change of absorbance intensity was observed as well.

Based on the data, obtained in a set of experiments, it can be assumed, that antibiotic DC, contrary to the existing literature data, can forms chelate complexes with such cations as Ca^{2+} , Mg^{2+} and Al^{3+} . However, the mechanism of this interaction is still not find out and requires further studies.

Conclusion. As a result of the conducted study we clear up, that TC and DC interaction with metal salts can be clinically significant and requires further study of a bioavailability.