DEVELOPMENT OF UV-SPECTROPHOTOMETRIC PROCEDURES FOR SECNIDAZOLE QUANTITATIVE DETERMINATION

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Introduction. 5-nitroimidazoles are the group of antiprotozoal medicines widely used for treatment of infectious diseases caused by Trichomonas, Lamblia, Leishmania, etc. Secnidazole is one of the medicine from the group of 5-nitroimidazoles, it is characterized by a prolonged serum half-life. Chemically, secnidazole is 1-(2-methyl-5-nitroimidazol-1-yl)propan-2-ol.

Aim. To develop a number of UV-spectrophotometric procedures of secnidazole quantification and carry out step-by-step validation of the developed procedures in the variants of the method of calibration curve and method of standard to choose the optimal variant for further application.

Materials and methods. Secnidazole was of pharmacopoeial purity. All spectrophotometric measurements were carried out using a single beam UV/VIS spectrophotometer SPEKOL®1500 (Analytik Jena AG, Germany).

Results and discussion. The secnidazole chemical structure supposes its existence in different forms when changing medium pH. The presence of such transformations is confirmed by the data of UV-spectrophotometry. UV-spectra of secnidazole in 0.1 M hydrochloric acid solution (A), 96% ethanol (B), 0.1 M potassium hydroxide solution in methanol (C), 0.1 M sodium hydroxide solution (D) have been investigated and it has been set that when increasing the pH value step-by-step shift of substance maximum absorption to the right is observed (277 nm → 310 nm → 314 nm → 319 nm). For each absorption maximum and solvent the values of specific absorbance have been calculated for the concentration range of 5 – 35 μg/mL.

The procedures of secnidazole quantitative determination by the method of UV-spectrophotometry have been developed using the mentioned solvents and wavelengths respectively. Their validation by such parameters as stability, linearity, accuracy and precision in the variants of the method of calibration curve and method of standard has been carried out. The procedures A, B and D of secnidazole quantitative determination are acceptable for application. The best linearity, accuracy and repeatability have been fixed for the procedure D in the variant of the method of calibration curve.

Conclusions. Three new procedures of secnidazole quantitative determination by the method of UV-spectrophotometry have been developed using 0.1 M hydrochloric acid solution, 96% ethanol and 0.1 M sodium hydroxide solution as the solvents. Their validation has been carried out and acceptability for application has been shown.