DEVELOPMENT OF UV-SPECTROPHOTOMETRIC METHOD OF QUANTITATIVE DETERMINATION OF ANTIDEPRESSANT ATOMOXETINE

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Itroduction. Antidepressant poisonings occupy a leading position among the psychotropic drug intoxications all over the world. Atomoxetine (ATX) ((3R)-*N*-methyl-3-(2-methylphenoxy)-3-phenylpropan-1-amine hydrochloride) is a monocyclic antidepressant related to selective norepinephrine reuptake inhibitors. The drug is used for treating attention deficit hyperactivity disorder (ADHD). ATX is associated with the serious complication such as increased risk of suicidal thoughts or actions in children and teenagers with ADHD. Several ATX fatal intoxications have been reported. Postmortem fluid and tissue distribution of ATX were within the range for various cases: aorta blood 0.1–8.3 mg/L, femoral blood 0.1–5.4 mg/L, bile 1–33 mg/L, liver 0.44–29 mg/kg, urine <0.1 mg/L, gastric 16.8 mg (total). According to the literature the main trend of development of bioanalytical methods for ATX determination is the prevalence of HPLC-MS. However, this method of the analysis is not always available for the toxicological laboratory.

The aim of this study was to develop simple and sensitive method for ATX quantitative determination with using UV-spectrophotometry suitable for the chemical and toxicological analysis.

Materials and methods. The UV-spectrum of ATX in 0.1 M hydrochloric acid solution was measured over 215–380 nm wavelength range, 10 mm light pathway cuvette was used. The reference solution was 0.1 M hydrochloric acid. Absorption maxima were detected at 270 nm (E^1_1=45; ε=1300) and 277 nm. UV spectrophotometric determination of ATX was performed at 270 nm. Stock solution (300 μg/mL) and 8 working standard solutions (WSS) (15.0; 30.0; 60; 90; 120; 150; 180 and 210 μg/mL) of the drug were prepared. The absorption values obtained for 8 WSS were processed by linear regression method, its general form is described by the following equation: Y=bX+a.

Results and discussion. The equation of the regression line was the following: $Y=(0.00456\pm8\cdot10^{-5})\cdot X+(0.015\pm9\cdot10^{-3})$;·(r=0.999); LOD and LOQ values were, respectively, 3.2 μg/mL and 9.7 μg/mL. They were calculated from the standard deviation of the intercept of the regression (S_a) accordance with the relevant equations: $LOD=3.3S_a/b$ and $LOQ=10S_a/b$. The linearity of the calibration curve was within the range of ATX concentrations from 15.0 to 210 μg/mL.

Conclusions. Thus, the UV-spectrophotometric method developed satisfies the requirements of the chemical and toxicological analysis by the sensitivity and can be used in toxicological study of the biological samples for presence of ATX.