

Abstract

Terconazole is one of the triazole derivatives with an antifungal effect. It is used locally to treat vaginal yeast infections. Terconazole could interact with copper cations in the vagina or uterus of women, who use an intrauterine device releasing copper cations. Other triazole derivatives in complexes with copper cations differ in their properties like toxicity or mobility. Cu^{2+} can be reduced in the presence of triazoles, which can lead to a Fenton-like reaction and production of free radicals. Thus, the $\text{Cu}^{2+}/\text{Cu}^+$ terconazole system can be potentially dangerous. Stoichiometry, fragmentation and stability of forming complexes were studied with tandem mass spectrometry. The $\text{Cu}^{2+}/\text{Cu}^+$ terconazole system was measured within pH range from 4 to 7.2, with a concentration ratio of CuCl_2 and terconazole 1:5 to 20:1, with water and ethanol as solvents (1:1). Results suggest that terconazole is partially oxidized in the Cu^{2+} /terconazole system and that this oxidation depends on the pH of a solution. Apart from oxidized and protonated terconazole, other detected ions and complexes were not significantly influenced by pH. The detection of complexes containing Cu^+ is alarming because this could correspond with the occurrence of a Fenton-like reaction.

Key words

Terconazole, copper cations, complexes, ESI-MS/MS, CID