



# The Effect of Vitamin C on Ketoconazole Absorption in AIDS Patients

Thesis Title: The Effect of Vitamin C on Ketoconazole Absorption in AIDS Patients

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Major Program: Clinical Pharmacy

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### Abstract

Ketoconazole is a dibasic antifungal agent, which requires acidic environment for its dissolution. Incomplete absorption of ketoconazole is a problem in AIDS patients due to gastric acid hyposalivation. The study was aimed to investigate the influence of vitamin C on the absorption of ketoconazole in AIDS patients. A randomized crossover design with seven-day wash out period between each treatment was employed. Eleven patients whose CD<sub>4</sub> cell count less than 200 cell/mm<sup>3</sup> were recruited. The patients were randomly treated with either ketoconazole alone (treatment A) or ketoconazole and vitamin C (treatment B). The plasma concentrations of ketoconazole were measured by high-performance liquid chromatography. Mean area under the ketoconazole concentration-time curve from zero to infinity (AUC<sub>0-∞</sub>) of treatment B (13.26 ± 6.58 µg.h/ml) was not significantly different from treatment A (10.22 ± 7.35 µg.h/ml). However, the increment of approximately 2-fold of ketoconazole absorption was observed when the drug was taken with vitamin C. Also, the mean maximum ketoconazole plasma concentration after treatment B was significantly higher than after treatment A, 3.91 ± 1.54 µg/ml vs. 2.69 ± 1.95 µg/ml, respectively (*p* = 0.033). More importantly, subgroup analysis showed that concomitantly administered ketoconazole with vitamin C significantly increased AUC<sub>0-∞</sub> (*p* = 0.029) and C<sub>max</sub> (*p* = 0.007) of ketoconazole in patients who had no active opportunistic infection (stable illness). In conclusion, vitamin C was found to significantly increase the extent of ketoconazole absorption in AIDS patients with stable illness with the minimal effect on the rate of absorption.