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EFFECT OF OF MULTIPLE HIGH DOSES OF DHEA ON URINARY STEROIDS EXCRETION

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Abstract

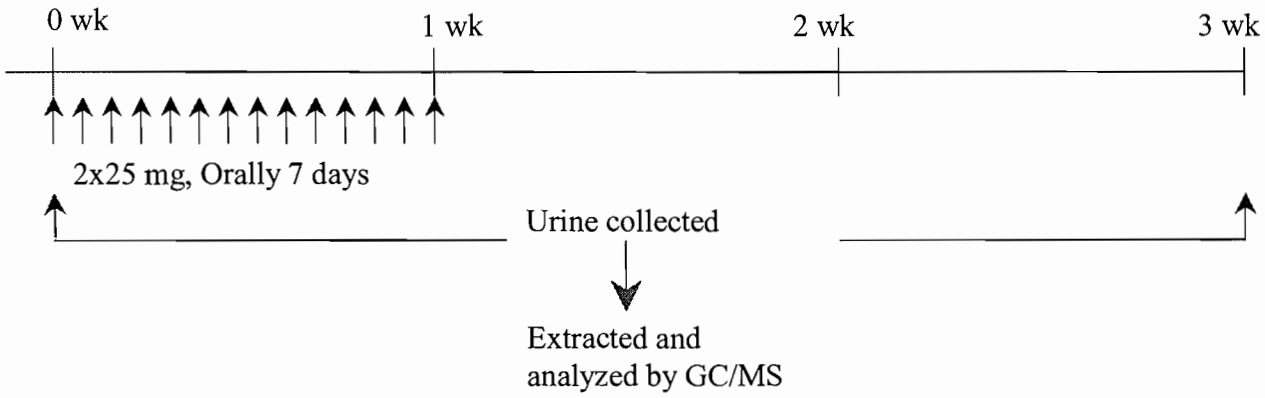
This study is to verify the effect of DHEA at multiple high dose, on the profile of endogenous steroid in healthy volunteers. Urinary excretion of glucuronide conjugated and free DHEA as well as other endogenous steroids were determined by using routine screening method. The results showed that the urinary excretion rate of DHEA, androsterone(A) and etiocholanolone(Etio) were significantly increased during the administration of DHEA and returned to the control level after cessation of DHEA. The A/Etio ratio was not altered. The excretion rates of testosterone(T) and epitestosterone(E) were not changed except in volunteer 2, who has a high basal level of testosterone, where the T/E ratio significantly increased up to 4 times of basal level. The influence of DHEA administration on other endogenous steroids will be discussed.

Introduction

Dehydroepiandrosterone (DHEA), one of the principle steroid in the metabolic pathway of the endogenous steroids, has been widely used to enhance performance of athletes. The level of DHEA metabolism product, such as testosterone, 5α-androstan-3α-17β-diol (5α-diol), 5β-androstan-3α-17β-diol (5β-diol), androsterone(A), etiocholanolone(Etio) may be proof the intake of exogenous DHEA. Testosterone/epitestosterone(T/E) and A/Etio ratio are also considered.

Experimental

Commercial DHEA tablets, Your Life® from Leiner Health Product Inc. Carson, California 90745, USA was given to three healthy male volunteers, 22-40 years old. They were given DHEA orally at the dose of 25 mg twice a day for 7 days. Urine sample were collected during the administration of drug and 2 weeks thereafter as shown in the diagram. Urinary excretion of glucuronide and free metabolites were analyzed by using screening procedure for anabolic steroids[1].



The amount of endogenous steroids excreted in urines were determined and expressed as the rate of excretion per hour.

Result and Discussion

The urinary excretion rates are shown in Fig. 1-11. The urinary excretion rate of DHEA, androsterone(A) and etiocholanolone(Etio) were significantly increased during the administration of DHEA and returned to the basal level after cessation of DHEA(Fig. 1-3). However A/Etio ratio was not altered (Fig. 4). The excretion rate of testosterone(T) and epitestosterone(E) were not changed except volunteer2 who has high basal level of testosterone, where testosterone excretion was elevated during DHEA intake(Fig. 5-6) and showed significant increase T/E ratio about 4 times from basal level(1.10 to 4.29)(Fig. 7). This result is the same as the finding of J.F. Levesque[3] and E. Setiawati[5]. Slight increased of 5α-diol and 5β-diol was observed, without any change in 5α-diol/5β-diol ratio(Fig. 8-10). Urinary excretion rate of 5β-tetrahydrocortisol(THF) was unchanged(Fig. 11).

Conclusion

In conclusion, this study has shown that increased urinary excretion of DHEA, androsterone and etiocholanolone are the observed during DHEA administration. The change in T/E ratio could be observed only in the volunteer with basal T/E ratio higher than 1.

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Figure 1. Urinary excretion rate of DHEA after DHEA administration

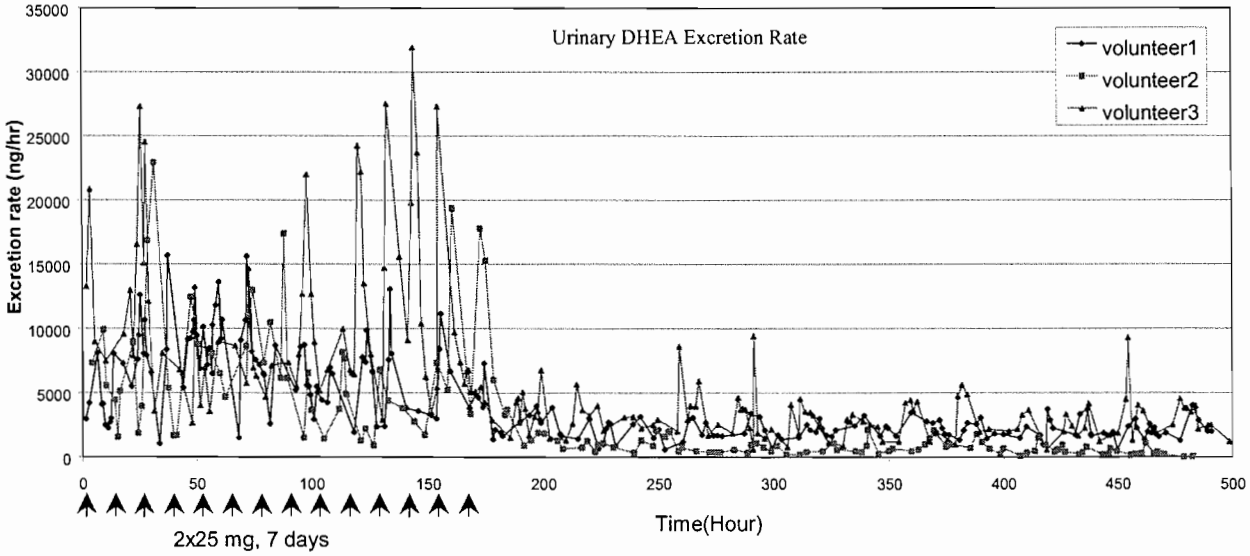


Figure 2. Urinary excretion rate of androsterone after DHEA administration

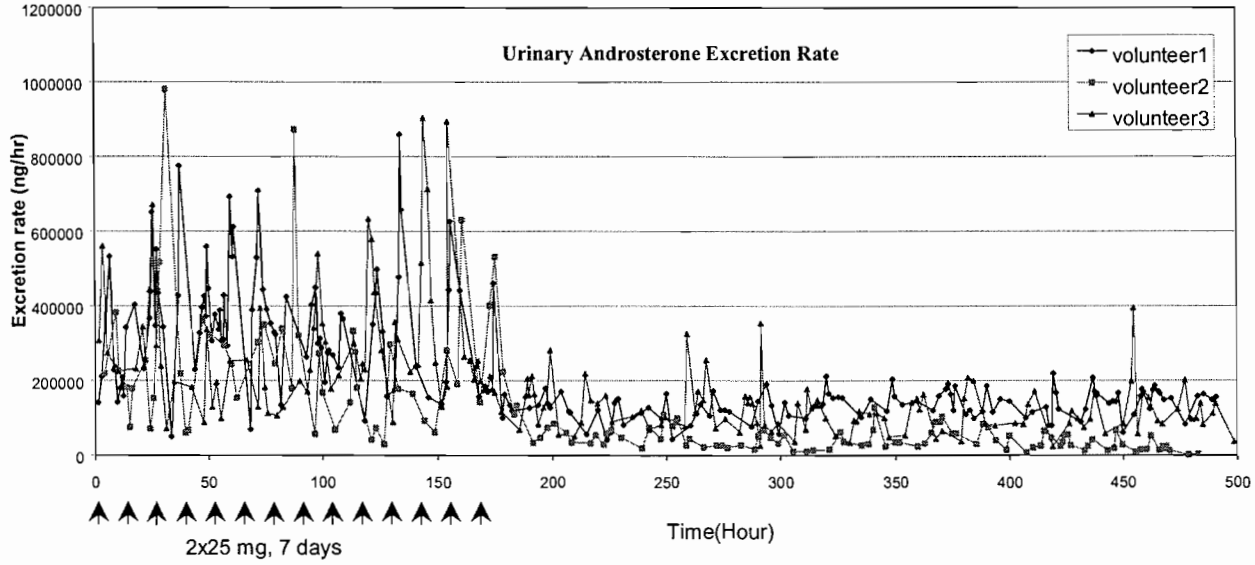


Figure 3. Urinary excretion rate of etiocholanolone after DHEA administration

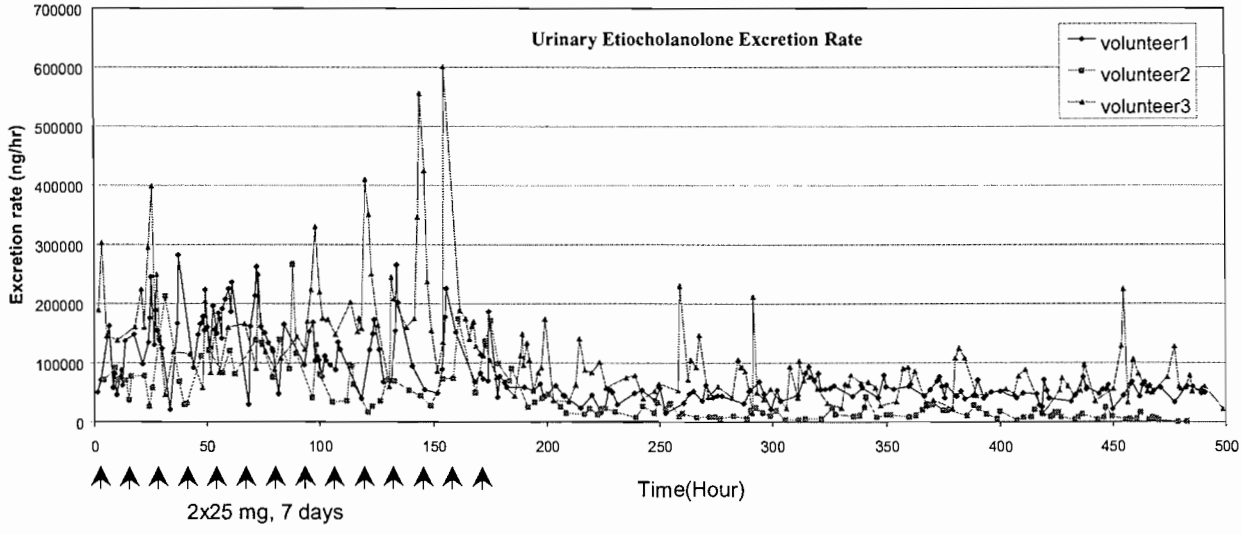


Figure 4. Androsterone and Etiocholanolone ratio after DHEA administration

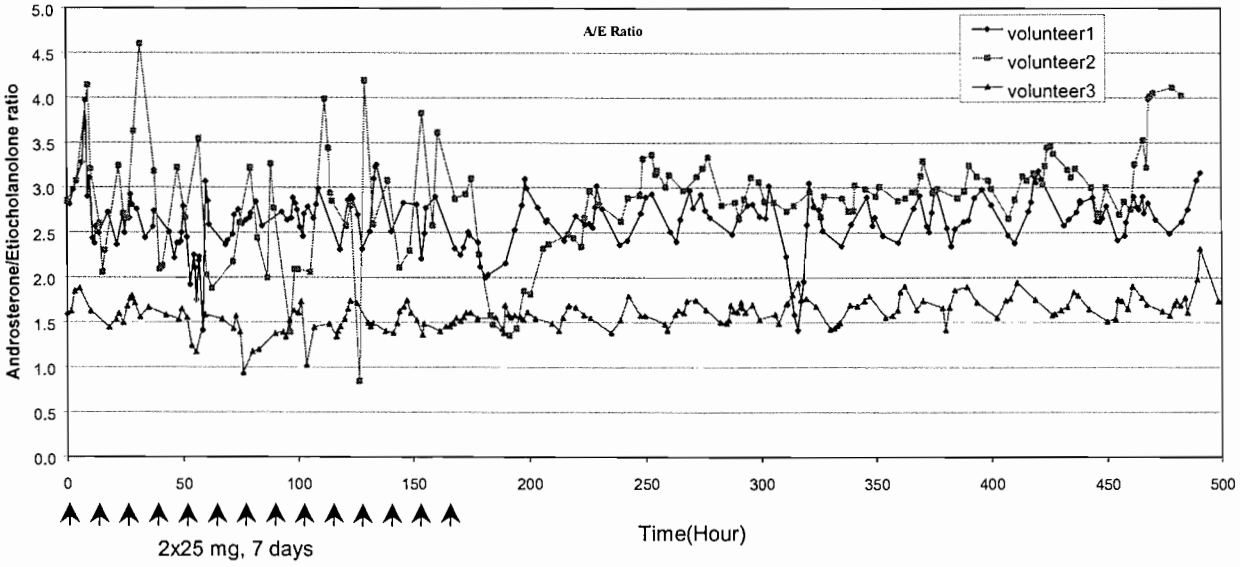


Figure 5. Urinary excretion rate of testosterone after DHEA administration

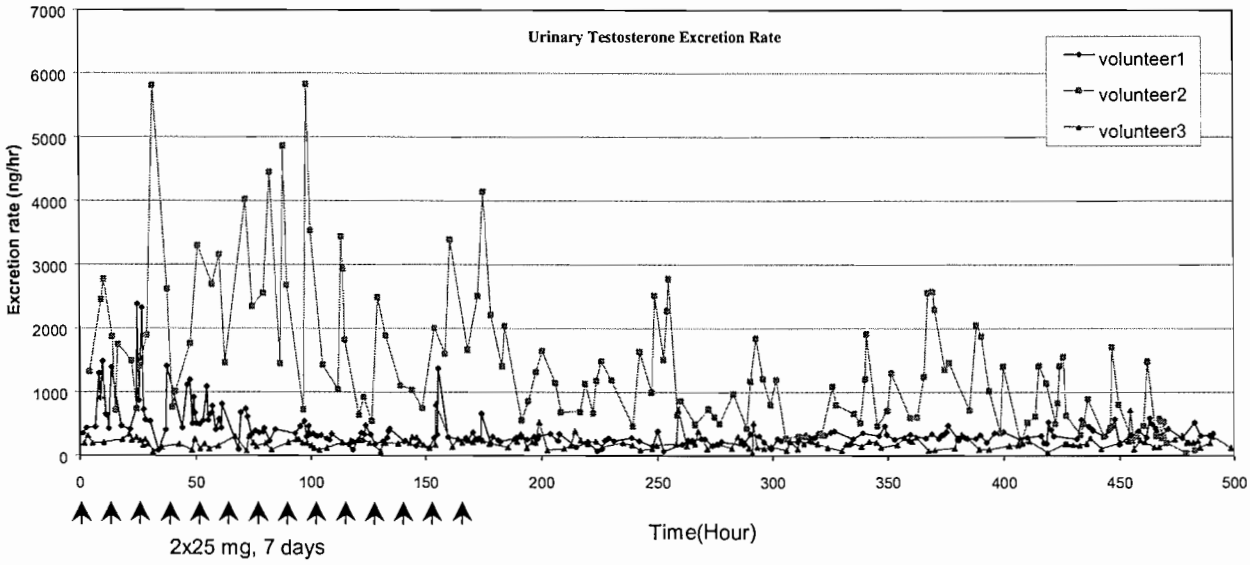
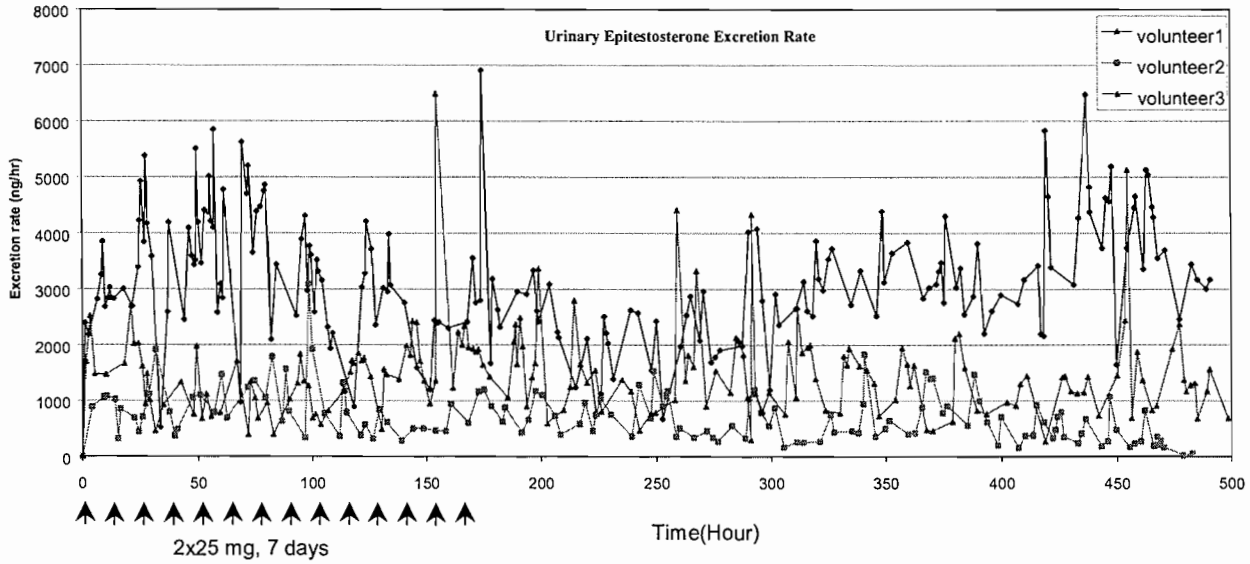


Figure 6. Urinary excretion rate of epitestosterone after DHEA administration



Figurre 7. Testosterone and epitestosterone ratio after DHEA administration

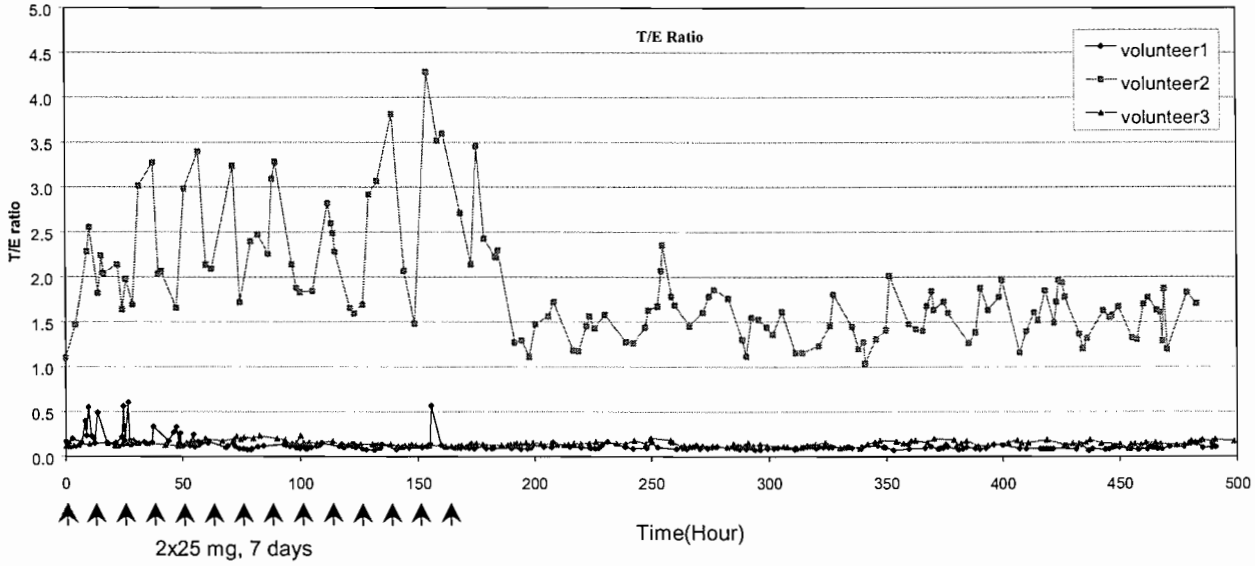


Figure 8. Urinary excretion rate of 5α-diol after DHEA administration

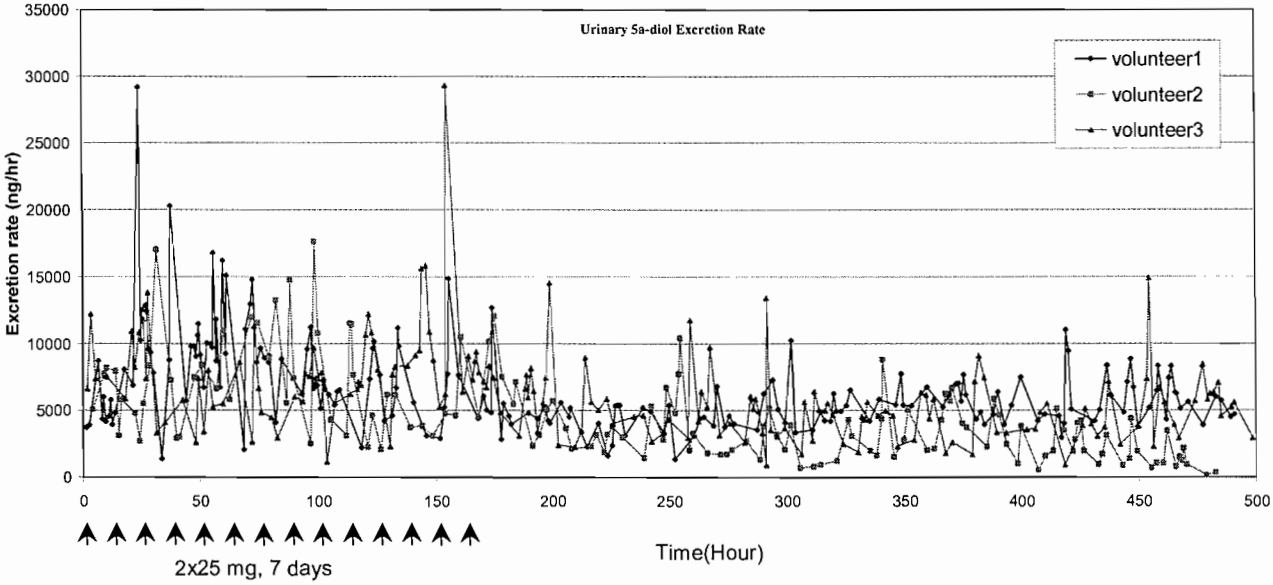
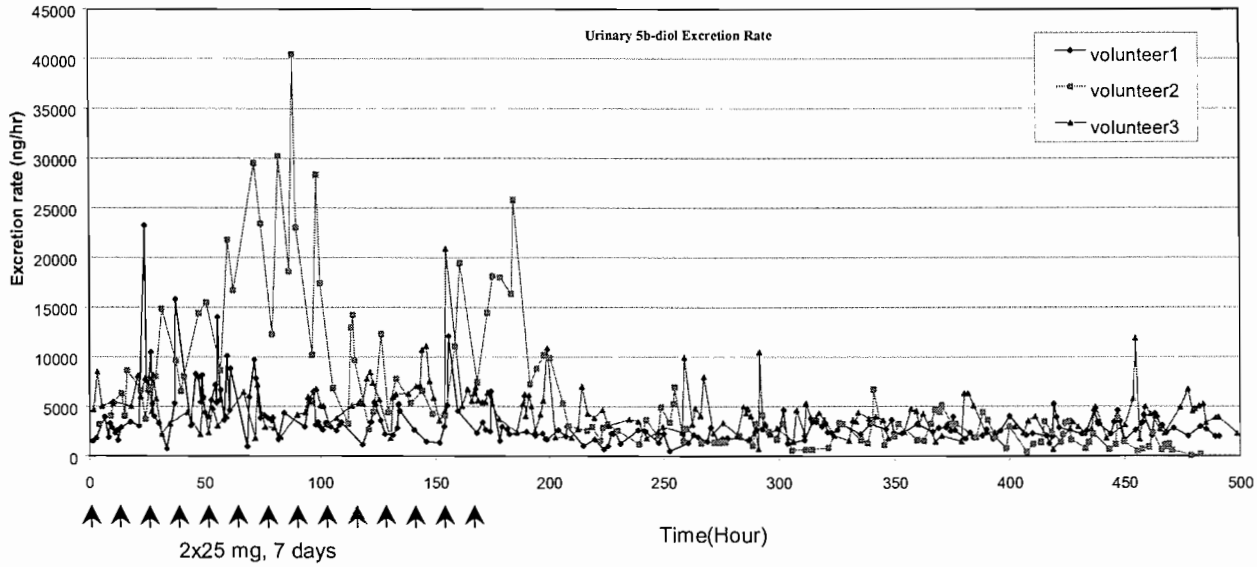


Figure 9. Urinary excretion rate of 5β-diol after DHEA administration



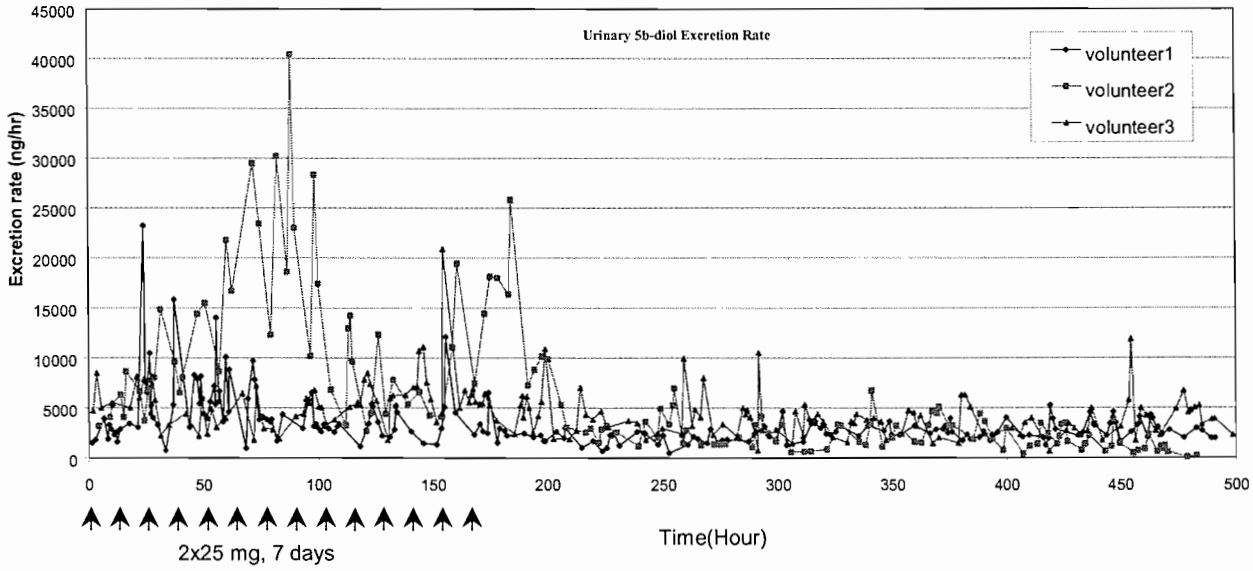


Figure 10. 5α-diol and 5β-diol ratio after DHEA administration

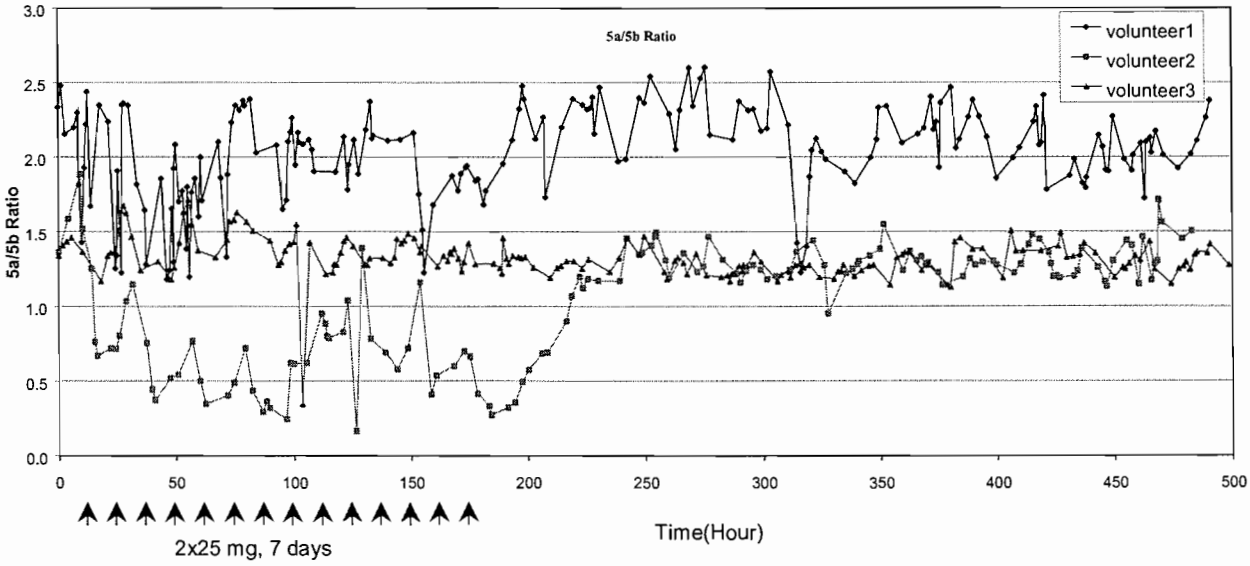


Figure 11. Urinary excretion of 5β-tetrahydrocortisol (THF) after DHEA administration