Designed for Men, Prescribed to Women. CYP1A2 Activity During the Menstrual Cycle

Ravn, Amanda (School: Nordsjaellands Grundskole og Gymnasium)

Women are often medicated according to the male body. Throughout history, women have been underrepresented in clinical trials within medical research, and drugs have been developed based on men. This has resulted in a limited understanding of the sex-related differences in pharmacokinetics, and women therefore face a higher risk of experiencing adverse effects. This study aims to investigate whether the activity of the enzyme CYP1A2 fluctuates between the early follicular phase and around ovulation. Six female participants aged 16-19 participated in this study. Testing took place twice: in the early follicular phase (days 4–5 of the menstrual cycle) and during the late follicular phase/around ovulation (days 13–14). Caffeine was used as a marker for CYP1A2 activity measured by the paraxanthine-to-caffeine ratio. The participants were required to abstain from caffeine-containing foods and beverages for 72 hours before each test. Urine samples were collected from the participants and analyzed using HPLC-MS. For 5 out of 6 test subjects the ratio(paraxanthine/caffeine) increased from test 1(early follicular phase) to test 2(late follicular/ovulation). A p-value of 0.09 was observed between the two phases, indicating a need for a larger sample size to validate the results. The results suggest a possible link between the menstrual cycle and variation in CYP1A2 activity. It points to an increase in CYP1A2 activity around ovulation compared to the early follicular phase. Further studies with larger participant groups are needed to better understand the influence of the menstrual cycle on CYP1A2 activity.

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