DIETARY FIBRE AND OVARIAN HORMONES IN MENSTRUATING WOMEN

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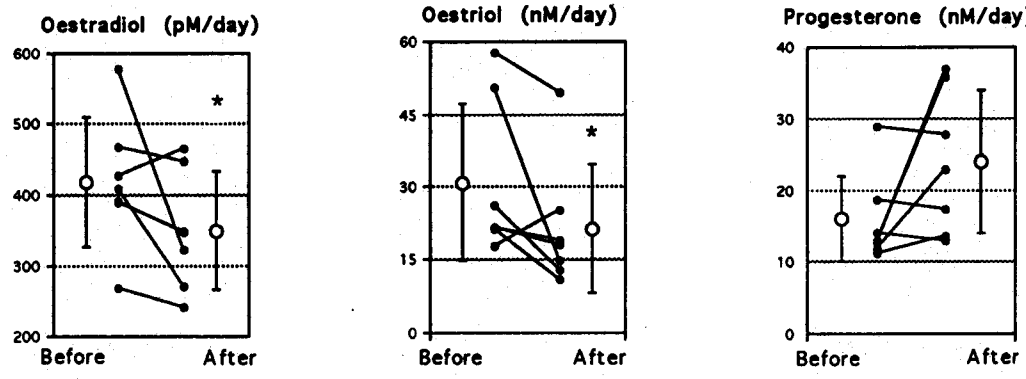
Oestrogens and progestogens stimulate normal cellular growth and proliferation in female breast tissue. Excessive exposure to oestrogen may promote neoplastic development of pre-existing mutations in breast cells. The aim of this study was to determine whether a three month supplement of dietary fibre could reduce ovarian hormone concentrations in blood and urine.

Eight normally-menstruating, women participated: mean age 35.4 (range 21 - 50) years, mean body mass index 22.1 (range 18.4 - 25.4) kg/m^2. The study extended over four menstrual cycles during which subjects were required to consume 50g of a commercially-available ready to-eat wheat bran cereal each day throughout cycles two to four. This corresponded to an increase of 15g of dietary fibre mainly in the insoluble form. Dietary intake was monitored throughout to ensure the normal diet did not change. Serial blood samples were obtained by finger-prick on Mondays, Wednesdays and Fridays before (in cycle one) and after (in cycles three and four) supplementation, and three 24-hour urine collections were provided in the mid-follicular phases. Plasma was analysed for oestradiol-1713 and progesterone, and urine was analysed for oestriol, using specific radio-immunoassays. Ovulation was timed by measurement of urinary luteinising hormone. Oestradiol and progesterone concentrations over each subject's menstrual cycles were plotted and the area under the curve (AUC) for each hormone profile was calculated. The AUC was divided by the number of days in the cycle and expressed in units per day to estimate the average daily hormone concentration in plasma. Oestriol concentration was expressed as the mean urinary excretion over 24 hours. One subject was excluded from the statistical analysis due to non compliance.



Mean plasma oestradiol, plasma progesterone and urinary oestriol concentrations before (cycle one) and after (average of cycles three and four) the dietary fibre supplement (n = 7). Vertical bars represent mean ± SD; * denotes a significant fall after supplementation; sloping lines represent the change in individuals.

After supplementation, plasma oestradiol concentrations fell by 16.5% ($P<0.05$) and urinary oestriol concentrations fell by 31% ($P<0.05$). There was no significant change in plasma progesterone concentrations (Wilcoxon Signed Rank tests). Results demonstrate that a short term increase in intake of insoluble dietary fibre can significantly reduce circulating oestrogens. A similar modification of long-term dietary fibre intake could lower the risk of breast cancer development by reducing concentrations of oestrogen in the circulation. Before making such recommendations to the community however, these results need to be confirmed in a larger group of women and over a longer period of time. We are currently doing this.

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