

INTRODUCTION

Quail egg (QE) consumption became popular among children for alleged health benefits. Based on our observation of premature thelarche (PT) in a few children who consumed QE, we investigated the relationship between QE and puberty by a clinical and an experimental studies.

METHODS

In the clinical study, a questionnaire was used to compare the frequency and amount of QE consumption (between girls with PT (n=55) and 54 age-matched controls who had well-controlled type-1 diabetes mellitus. In the experimental study, female Sprague-Dawley rats were orogastrically given QE (300, 1000 mg/kg/day) or 17 β -estradiol (E2, 50 mg/kg/day) or tap-water (control) starting by postnatal 14th day and continued until 30th day. Anthropometric measurements and the age of vaginal opening were recorded, vaginal smears were analyzed. Following sacrifice, serum FSH and estradiol levels were measured. Histological examination of uterus and ovaries were performed. Data were compared using chi-square (patients) and one-way ANOVA (rats).

RESULTS

QE consumption in the diabetic control girls was either mild (20.4%) or moderate (7.4%), while a heavy QE consumption (20%) along with moderate (21.8%) and mild (18.2%) intake was present in PT-girls (p<0.01) (Fig.1). Uterine and ovarian weights of E2- and QE-treated rats were higher than those of the control group. Vaginal smear analysis and histological analysis confirmed elevated counts of vaginal cornified cells and high numbers of endometrial glands of uterus, indicating enhanced estrogenic activity in QE-treated (p<0.05) and E2-treated (p<0.001) rats (Fig. 2), while FSH and estradiol levels were increased compared to control group of rats (p<0.05-0.01) (Fig. 3)..

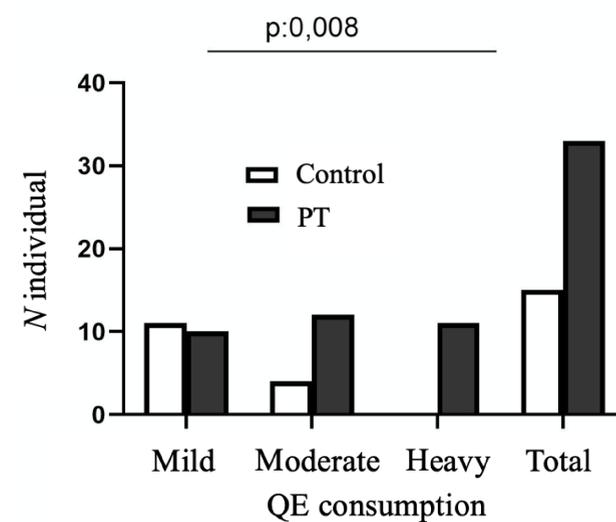


Figure 1: Comparison of low, moderate and heavy QE consumption status of control and PT groups.

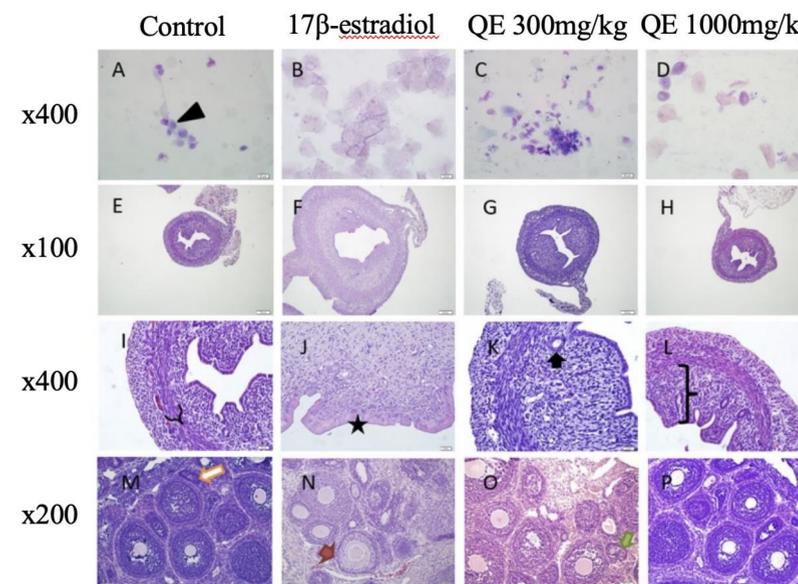


Figure 2: Comparative pictures of smear, uterine and ovarian histology of the groups.

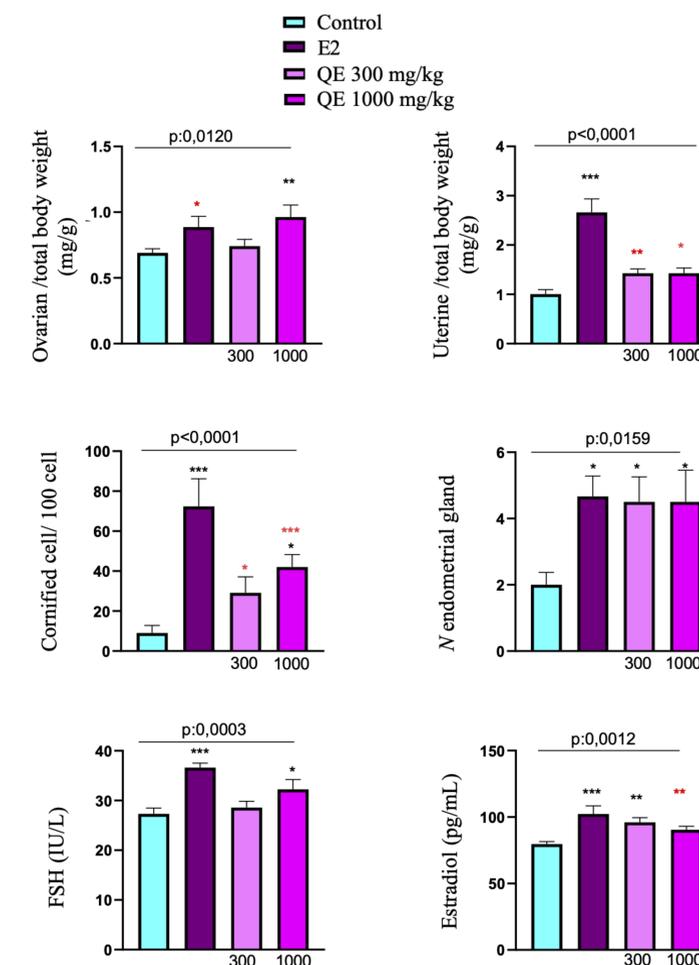


Figure 3: Comparison of uterine and ovarian weight, number of cornified cells seen in vaginal smear evaluation, number of endometrial glands, FSH and estradiol levels.

CONCLUSIONS

Both our clinical observation of a higher quail egg consumption in girls with PT and experimental data demonstrating increased uterine and ovarian weights, elevated serum estradiol and FSH levels, and cornification of vaginal epithelium suggest that quail egg needs to be further investigated as a potential endocrine disrupter in children.