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Data Article

Data describing lack of effects of 17 α -ethinyl estradiol on mammary gland morphology in female mice exposed during pregnancy and lactation



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ABSTRACT

Ethinyl estradiol (EE) is a synthetic estrogen used in pharmaceutical contraceptives. In many studies evaluating estrogenic endocrine disruptors, EE is used as a positive control for estrogenicity. However, the effects of EE often differ from the effects of other xenoestrogens, suggesting that these other compounds might act via distinct mechanisms. Reported here are data describing the effect of low doses of EE during pregnancy and lactation on the morphology of the lactating mammary gland in CD-1 mice. The data suggest that these low doses have few if any discernable effects on mammary gland morphology. Alterations to cell proliferation and the expression of estrogen receptor (ER) α were also not observed. These companion data were collected from the same females analyzed for effects of EE on maternal behavior and brain recently published in *Reproductive Toxicology* (Catanese & Vandenberg, 2017).

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Specifications Table

Subject area	<i>Biology</i>
More specific subject area	<i>Endocrinology, reproductive science, endocrine disruptors</i>
Type of data	Figures, graphs Whole mount mammary glands Histological stain: Hematoxylin & Eosin Immunohistochemistry: Ki67 (marker of proliferation) and Estrogen Receptor α qRT-PCR: Esr1
How data was acquired	Zeiss AxioImager dissection microscope (whole mount glands) Zeiss Axio Observer.Z1 inverted microscope (histology and immunohistochemistry) Zeiss high resolution color camera
Data format	<i>Primary data, quantified and analyzed graphs</i>
Experimental factors	<i>Exposure of female CD-1 mice to 0.01 or 1 μg ethinyl estradiol/kg/day from pregnancy day 9 through lactational day 20; oral route of exposure Mammary glands collected on lactational day 21 Whole mount mammary glands stained with carmine alum; mammary glands fixed in neutral buffered formalin, paraffin embedded and sectioned</i>
Experimental features	<i>Assessment of mammary gland morphology; quantification of epithelial cell proliferation; expression of estrogen receptor α in females exposed to vehicle (control) compared to females exposed to one of two doses of ethinyl estradiol</i>
Data source location	<i>Amherst, MA, USA</i>
Data accessibility	<i>Data are present in this article</i>

Value of the data

- Many studies examining the effects of estrogenic endocrine disrupting chemicals use EE as a positive control for estrogenicity
- Although high doses of pharmaceutical estrogens are known to disrupt lactation in rodents and women, the effects of low doses are not well described
- These data, together with data published elsewhere, can be used to identify endpoints that are sensitive and insensitive to xenoestrogens in females exposed during pregnancy and lactation

1. Data

The mammary gland whole mounts and histological sections displayed in Fig. 1A are representative images from female CD-1 mice exposed to vehicle, 0.01 or 1 μg ethinyl estradiol (EE)/kg/day from pregnancy day 9 through lactational day 20. Quantification of mammary gland intensity, a measure of the epithelial density, reveals modest but non-significant decreases in the amount of mammary epithelium in EE-treated females (represented by higher intensity values) (Fig. 1B).

To further investigate the effects of EE on morphology of the lactating mammary gland, we evaluated two histological characteristics in fixed tissue at lactational day 21: the volume fraction of the mammary gland comprised of lobuloalveolar structures and lobule size (Fig. 2A,B). There was no effect of EE treatment on either parameter (Fig. 2C,D).

Finally, we examined the effect of EE treatment on cell proliferation (evaluated by quantifying the number of cells expressing Ki67, Fig. 3A) and the number of cells positive for estrogen receptor (ER) α

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