The forgotten mom: effects of perinatal exposure to a toxicant mixture on number of estrogen receptors in postpartum rat brain.

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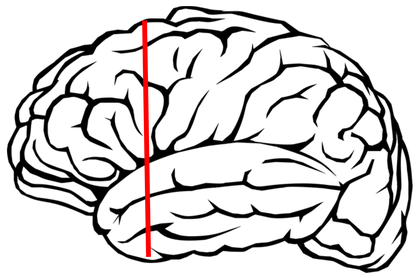
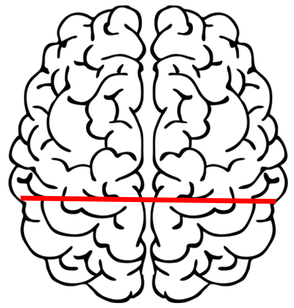




INTRODUCTION

❖Exposure to toxicants can greatly affect neurodevelopment.

❖Given that offspring brain development is related to maternal care, it is imperative to know if these environmental perturbations also impact maternal brain and behavior.

❖The effects of neurotoxicants on pregnancy and the post-partum female brain are rarely assessed.

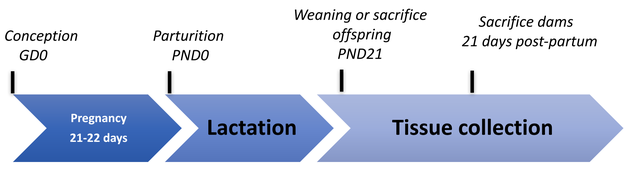
AIM

❖The objective of this research was to evaluate the effects of perinatal exposure to an ecologically relevant mixture of toxicants on maternal brain plasticity.

❖The mixture is one that mimics the proportion of these chemicals measured in Northern populations.

❖Toxicant mixture made up of methyl mercury (MeHg), PCBs, and organochlorine pesticides.

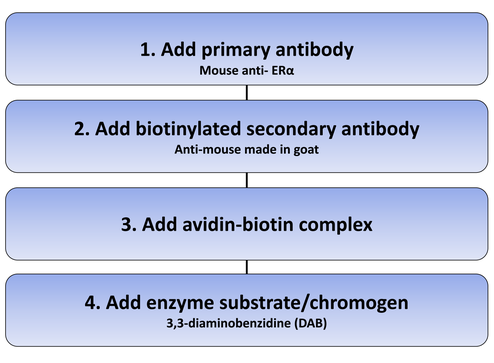
METHODOLOGY



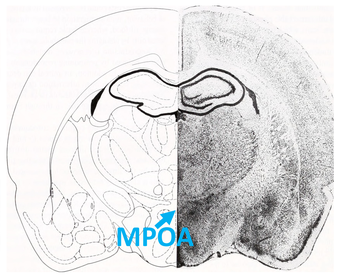
Vehicle or chemical exposure throughout pregnancy and lactation via ingestion of a Teddy Graham

Vehicle (corn oil);
MeHg – low and high dose (0.01 and 1.0 mg/kg/day, respectively);
Toxicant Mixture – low and high dose (0.04 and 4.0 mg/kg/day, respectively)

ERα immunohistochemistry



Microscopy and Cell counts (Image J)
Medial Preoptic Area (MPOA) is involved in maternal behaviour



RESULTS

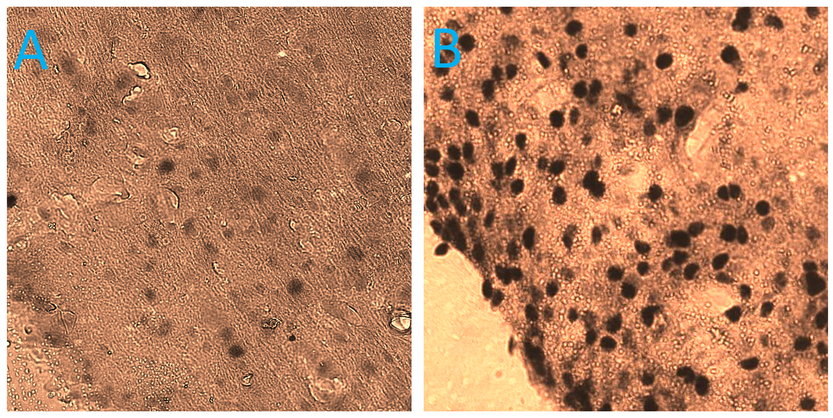


Figure 1. Pictomicrograph of rat brain sections showing (A) few estrogen receptor alpha cells and (B) many estrogen receptor alpha cells at location Bregma 0.24 mm at 400x magnification

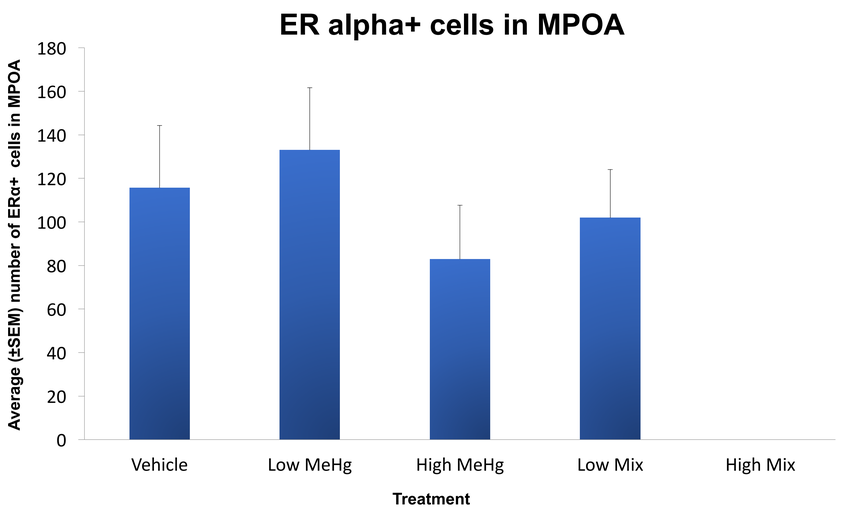


Figure 2. Mean (±SEM) number of ER alpha+ cells in each treatment group

Through statistical analysis via an ANOVA, we found no effect of treatment on the number of ER alpha+ cells in the MPOA of female rats.

DISCUSSION & CONCLUSION

❖This study did not demonstrate any significant effect on mother's brains from gestational exposure to toxicants.

❖Despite perinatal exposure to a toxicant mixture, the mother's brains still demonstrated that they had a similar number of ER alpha+ cell numbers.

❖Potential Reasons for no effect:
- ❖Truly no effect of the toxicants on the MPOA
- ❖The effect on the MPOA would be visible at an earlier postpartum time suggesting a transient effect

❖Future research should focus on multiple time points to ascertain whether an effect would be seen closer to parturition.

❖Future research should also investigate whether exposure to this toxicant affects ERα in other brain regions related to maternal behaviour.

❖Finally, research should also be conducted to assess the effects of this toxicant on maternal behaviour, per se.

References, acknowledgement and contact info

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