

In This Issue

In this issue of *Journal of Developmental Origins of Health and Disease*, we have the honor of presenting a themed issue focusing on prenatal exposures, with guest editors Kristi Kohlmeier and Morten Kristensen, as coordinated by our *J DOHaD* themed issue editor Janna Morrison. This themed issue contains one review article with six additional articles addressing prenatal exposures and health outcomes. Complementing the themed issue is an original article that relates to our prior themed issue on preterm birth and a review article discussing embryonal rhabdomyosarcoma.

Review Articles

Decoding the ‘embryonic’ nature of embryonal rhabdomyosarcoma. Lav *et al.* review the pathogenesis of embryonal rhabdomyosarcoma in an attempt to understand its relation to normal myogenesis. The authors provide a superb review of the physiology of myogenesis and the variation by which rhabdomyosarcoma arises, including alterations in genetics, signaling pathways and environmental influences.

Nicotine during pregnancy: changes induced in neurotransmission, which could heighten proclivity to addict and induce maladaptive control of attention. Kohlmeier reviews the relation between nicotine exposure in pregnancy with development of the fetal brain neurotransmitter systems, focusing on alterations within the laterodorsal tegmental nucleus, a site critically important in attention and addiction. The author provides a convincing case as to how nicotine exposure results in a transgenerational addiction proclivity.

Original Articles

Electrophysiological changes in laterodorsal tegmental neurons associated with prenatal nicotine exposure: implications for heightened susceptibility to addict to drugs of abuse. Christensen *et al.* utilized a model of brain slices of prenatally nicotine-exposed and drug-naïve mice to examine calcium imaging and whole-cell patch clamping. The authors found that nicotine altered calcium rise and action potentials with divergent effects in prenatally nicotine-exposed slices. The alteration with age of offspring mice further suggest that the juvenile period may be most susceptible to *in utero* effects of nicotine exposure.

Prenatal diethylstilbestrol exposure and risk of obesity in adult women. Hatch *et al.* utilized data from the National Cancer Institute DES Follow-Up Study to examine the association between diethylstilbestrol (DES) and adult obesity

among women prenatally exposed. The study results suggest that prenatal DES exposure was associated with a small increase in adult obesity with stronger associations at lower doses and exposures later during gestation.

Prenatal diethylstilbestrol exposure and reproductive hormones in premenopausal women. Wise *et al.* examined outcomes of participants from a Harvard Study of premenopausal women from Massachusetts (1995–1999). Diethylstilbestrol (DES)-exposed women had lower mean concentrations of estradiol and inhibit B and higher mean concentrations of follicle-stimulating hormone and luteinizing hormone, suggesting a significant long-term impact of prenatal DES exposure and reproductive function.

Intrauterine exposure to smoking and wheezing in adolescence: the 1993 Pelotas Birth Cohort. Werhmeister *et al.* utilized the 1993 Pelotas Birth Cohort, a population of over 5000 urban live births from Southern Brazil, to examine the association between maternal and partner smoking and offspring wheezing from 11 to 15 years of age. The authors demonstrated that maternal smoking during pregnancy showed a dose–response association with wheezing crises at age 15, presence of persistence wheezing and diagnosis of asthma.

Prenatal nicotine is associated with reduced AMPA and NMDA receptor-mediated rises in calcium within the laterodorsal tegmentum: a pontine nucleus involved in addiction processes. McNair and Kohlmeier utilized brain slices from prenatal nicotine-exposed and control mice to assess glutamate signaling within the laterodorsal tegmental nucleus, a region associated with addictive behavior. Prenatal nicotine exposure significantly decreased AMPA receptor-mediated calcium responses. These findings, coupled with previous reports in this issue, provide further evidence for the generational predisposition to smoking and addiction.

The impact of prenatal parental tobacco smoking on risk of diabetes mellitus in middle-aged women. La Merrill *et al.* examined the Child Health and Development Studies pregnancy cohort from Kaiser Foundation Health Plan to assess the association of prenatal maternal smoking with female offspring diabetes. Prenatal smoking demonstrated a significant association with daughters’ diabetes mellitus risk. These findings provide further evidence that prenatal environmental chemical exposures may contribute to adult diabetes mellitus.

Preterm birth affects GABA_A receptor subunit mRNA levels during the foetal-to-neonatal transition in guinea pigs.

Shaw *et al.* examined fetal guinea pig brains from newborns delivered preterm or term. The authors demonstrate levels of GABA_A receptor subunits remarkably lower in the cerebellum of preterm guinea pigs and the increase in mRNA during neonatal transition at term was not seen in the preterm offspring. These findings have significant

implications for the neurodevelopmental affects of neurosteroid exposure.

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