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Effects of prenatal exposure to diesel particles in mice

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Exposure to diesel exhaust may affect reproductive outcome. However, the relative contribution of exhaust gases versus exhaust particulate to the adverse effects is unclear. This study aimed to investigate, in an animal model, if exposure to diesel exhaust particles (DEP; NIST 2975) would affect development, especially of neurobehavioral functions. Pregnant mice (C57BL/6BomTac) were exposed to 20 mg/m³ DEP on gestational days 9-20, 1 h/day. Endpoints included: maternal gestational and litter parameters, organ weights at weaning, activity, and learning and memory. Gestational and lactational body weights were similar in control and diesel dams, and so were absolute and relative maternal organ weights at weaning. Litter size, gender ratio and implantation loss did not differ between groups. Shortly after birth, body weights of DEP offspring were numerically, but not significantly lower than in controls. The difference increased during lactation, as weight gain was especially affected during the latter part of the period, and at weaning diesel exposed offspring weighed significantly less than control progeny. At the age of two months, the offspring was tested for learning ability, and three weeks later for memory in the Morris maze. In between, activity was monitored in the open field. Performance was similar in control and exposed offspring in the behavioural tests. Thus, no effect on neurofunction was detected. However, postnatal growth proved sensitive to maternal gestational exposure to diesel particulates.