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DAT 9-repeat allele, prenatal lead and child development

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Dopamine transporter gene (DAT) contains variable number of tandem repeats (VNTRs). There is evidence that 9-repeat allele is associated with improved attention and executive function. We investigated role of prenatal lead exposure and DAT polymorphisms in predicting cognitive development in Mexican children. Maternal blood lead concentrations (BPb) were collected at delivery. Bayley Scales of Infant Development (BSID) were administered every 6 mo up to 36 mo. McCarthy Scales of Children's Abilities were administered at 42 and 48 mo. For present analysis, 294 and 233 children had complete data at 24 and 48 mo. BSID index (24 mo) or McCarthy scales (48 mo) were modelled as function of BPb and DAT VNTR (including interactions). Children with at least one long-repeat (7 or 9) allele (20%) were compared to children with short-repeat allele (1 or 3). Mean PbB was 8.5±4.2 μg/dL. Mean 24-mo Bayley MDI and PDI was 92±14 and 93±12 points; McCarthy General Scale at 48 mo was 93±13 points. In covariate-adjusted models, DAT was not related to BSID. BPb was associated with MDI (β=-0.3, p=.08) but not PDI. BPb-BSID relationship did not differ by VNTR. BPb was not associated with McCarthy Scales. Long-repeat allele was positively associated with Quantitative Scale (3.1±1.4, p=.02). BPb-McCarthy Scale relationship differed by VNTR. Scores were worse with long-repeat than short-repeat alleles as follows (results compare BPb effect in long vs. short allele strata): Perceptual Scale (0.1±0.1 p=.62 vs. -0.8±0.3 p=.01), Quantitative Scale (-0.02±0.1 p=.86 vs. -0.8±0.3 p=.03), General Cognitive Scale (-0.1±0.2 p=.52 vs. -0.8±0.4, p=.08).