

Dr Katarzyna Kordas  
Harvard School of Public Health, OHP  
401 Park Drive  
02215 Boston  
USA  
Email: [kkordas@hsph.harvard.edu](mailto:kkordas@hsph.harvard.edu)  
Phone: 617 384-8876

Abstract:  
DAT 9-repeat allele, prenatal lead, and child development

Katarzyna Kordas\*, Adrienne Ettinger, Joel Schwartz (Harvard School of Public Health, Boston, MA, USA), David Bellinger (Children's Hospital, Boston, MA, USA), Mara Tellez Rojo, Mauricio Hernandez Avila, Hector Lamadrid (National Institute of Public Health, Cuernavaca, Mexico), Howard Hu (University of Michigan School of Public Health, Ann Arbor, MI, USA), Lourdes Schnaas (National Institute of Perinatology, Mexico City, Mexico), and Robert Wright (Harvard School of Public Health, Boston, MA, USA).

Dopamine transporter gene (*DAT*) contains variable number of tandem repeats (VNTRs). The 9-repeat allele is associated with improved attention and executive function. We investigated the effects of prenatal lead exposure and *DAT* polymorphisms on cognitive development in Mexican children. Maternal blood lead (BPb) at delivery was measured. 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) and McCarthy scales (48 mo) were modeled 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  $8.8 \pm 4.3$   $\mu\text{g}/\text{dL}$ . Mean 24-mo MDI and PDI was  $92 \pm 14$  and  $93 \pm 12$  points; 48-mo McCarthy General Scale was  $93 \pm 13$  points. In covariate-adjusted models, *DAT* did not predict BSID. BPb was associated with MDI ( $\beta = -0.2$ ,  $p < .05$ ). This relationship differed by VNTR, in that scores were worse with increasing lead in long vs. short allele strata: ( $\beta = -1.0$ ,  $p < .05$  vs.  $\beta = -0.2$ , ns). PbB was not associated with Bayley PDI or McCarthy Scales scores. Long-repeat allele was positively associated with McCarthy Quantitative Scale ( $2.8 \pm 1.1$ ,  $p = .02$ ). BPb-McCarthy Scale relationship did not differ by VNTR. Prenatal lead was negatively associated with early cognitive development, particularly in children with higher VNTRs in the *DAT* gene.