Developmental exposure to PCBs differentially alters sensitivity to audiogenic and kindling-induced seizures in rats.

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Previously we reported an increased incidence of audiogenic seizures in offspring of pregnant rats exposed to an environmental mixture of polychlorinated biphenyls (PCBs). This study compares the proconvulsant properties of PCB exposure in audiogenic and electrical kindling seizure models. Adult male offspring exposed to 0 (n=9) or 6 (n=8) mg/kg/day of the PCB mixture during gestation and lactation were equipped with electrodes in the amygdala. Threshold for induction of an electrographic afterdischarge (AD) was established in response to a 1-s train of pulses (60Hz, 1ms pulsewidth, 50-200μA). Thereafter, stimulation was delivered once daily at 200μA until a fully generalized seizure (Racine Scale) was evoked. Electrographic and behavioral seizure characteristics were recorded in response to each stimulation. Littermates were exposed to an audiogenic seizure paradigm (100dB noise, 8 kHz, 2m) and behavioral seizure response (wild running, clonus) recorded. Consistent with previous findings more PCB-exposed animals exhibited clonic seizures relative to controls (76% vs 22%) in response to noise. In contrast to an augmented seizure response, PCBs delayed the development of electrical kindling (X=16.4 vs 11.6 ADs to 1st Stage 5 seizure). This delay occurred in the early stages of kindling as significantly more sessions were required to advance animals from focal (Stage 1-2) to generalized (Stage 3-5) seizures. Groups did not differ in AD thresholds. A trend towards longer cumulative AD duration to 1st generalized seizure was evident also in the PCB-exposed group. A dissociation of responsiveness based on seizure model indicates that while developmental PCB exposure has proconvulsive effects at the level of the auditory brainstem, the same exposure slowed the progression of behavioral manifestations from a focal seizure site in the forebrain. The latter may be reflective of impaired plasticity mechanisms previously reported for PCB-exposed animals. *Does not reflect EPA policy*