The Effects of Early Drug Exposure on Brain Development

Message from the Guest Editor

Every year, millions of infants are exposed to psychoactive drugs, either through drug use or abuse by a pregnant mother, or as a part of in-hospital care. The high rate of premature births is a major public health issue in the U.S. because of the extremely high cost of medical care and frequency of subsequent long-term neurological and behavioral problems experienced by NICU patients. The poor neurodevelopmental outcome observed in this fragile patient population is often related to the brain injury sustained during the neonatal period. Premature infants are often hospitalized for weeks at a time, and a major part of NICU care involves the administration of powerful drugs to prevent pain or to provide sedation so that invasive procedures can be performed. These infants are often exposed to multiple psychoactive agents (i.e., opioids, stimulants, sedatives) alone or in combination. Preclinical and clinical evidence suggests that exposure to pediatric drugs may injure the brain or impair growth and development, resulting in long-term functional deficits.