National Institute on Drug Abuse Conference report on placental proteins, drug transport, and fetal development

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The use of illicit and licit drugs during pregnancy is a major public health concern because of potential adverse effects on the fetus and the risk to maternal health. Because the placenta is the primary link between the mother and the conceptus and is essential for the growth and survival of the fetus, abnormalities in placental formation and function resulting from drug use could have a major influence on pregnancy outcome. At present, little information is available on the impact of abused drugs on placental biology alone or in combination with other “host” factors (eg, stress,
The placenta is an extra embryonic tissue that is essential for the growth and survival of the fetus as it serves as the primary link between the mother and the developing fetus. Because the placenta performs numerous physiologic functions that are essential for the maintenance of pregnancy and fetal growth and development, abnormalities in placental formation and function are often associated with human pregnancy complications. Preeclampsia, placenta previa, and placental abruption complications seen in the general population, which are associated with adverse or poor fetal outcomes, frequently occur in women who abuse drugs during pregnancy, which represents a major public health concern.1-3 The clinical literature to date reports that infants born of mothers who used drugs, licit and illicit, have impaired somatic growth and development as well as neurobehavioral deficits.4-8 Other studies show that cocaine, marijuana, heroin, and other abused drugs can cross the placental barrier.9-11 However, at present, there is little information about the effects of these drugs on placental biology. Also, little information is available as to whether the detrimental effects seen in drug-exposed offspring are the direct result of perturbations in the development of placenta and its functions or caused by “host” factors such as poor prenatal care, stress, infection, and poor maternal nutrition, which are common comorbid factors in drug abusing women.4,12

Recent advances in the field of placental biology and the limited investigation of drugs of abuse related to the development of placenta prompted the National Institute on Drug Abuse (NIDA) to convene a meeting of biomedical researchers to discuss cutting-edge research with the mission to translate existing information to new clinical and research initiatives in the drug abuse field. This report summarizes the presentations and research recommendations resulting from the workshop discussions. © 2004 Elsevier Inc. All rights reserved.