



# Early childhood consequences of polydrug use during pregnancy



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## KEYWORDS

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**Abstract Objectives:** Polydrug use in pregnancy exposes children to perinatal consequences, but also to long lasting effects resulting both from their mothers' abuses and lifestyles or socioeconomic deprivation.

**Study design:** The 167 children born alive from 1999 to 2008 whose mothers used at least two substances at the beginning of their pregnancies were either followed up medically or their locations were traced at the end of 2010. One had died from sudden infant death syndrome. 20 could not be found, their mothers having moved.

**Results:** The intrauterine growth restriction varied considerably according to the number of abused products, and even more so when the mothers used four products or more including alcohol. Prematurity concerned 22.4% of the children but 31.3% when the mothers used four substances or more. If 25 children were separated from their mothers at discharge, at the end of the follow-up 41 had been separated, out of whom 12 were adopted and the others fostered. Six mothers died during this period.

Birth defects were assessed, mainly 8 FAS, 1 microcephaly and 1 down's syndrome. One girl was shaken to blindness. 22.8% of the children were described as having behavioral problems and 13.8% learning difficulties but only 4% benefited from special need education.

**Conclusions:** Compared to the results published in the last two decades, the data from this cohort show a clear decrease in severe birth adverse events, and maternal deaths. The long term prognoses seem influenced mainly by the number of products used during pregnancy, especially alcohol, the mothers' lifestyles and social deprivation.

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## Introduction

Children of drug abusing mothers bear the consequences of both the intakes of products and social conditions of their mothers at birth and throughout their lives. Works on adult health show the long lasting effects of being brought up in a family affected by drug abuse (Pilowsky et al., 2009). Many studies have assessed the consequences of substances in the newborns' development, but they often only mention the possible socio-demographic confounders. Until recently, works have distinguished the effect of illicit substances without controlling the mothers' other intakes, especially alcohol or tobacco. In the last decade, the role of multiple uses of substances has emerged in literature (Kashiwagi et al., 2005; Mayet et al., 2008; Pinto et al., 2010). For instance, a study on methadone treatment took into account tobacco but also the other products taken by the mother, and show that the high pre-term birth rates increase with the number of supplements to the methadone (Almario et al., 2009). Another series showed the aggravating role of benzodiazepines (Dryden et al., 2009; O'Donnell et al., 2009).

First, neuroimaging results show evidence of early consequences of drug or alcohol exposure to the structure, function and metabolism of the developing human brain (Roussotte et al., 2010). The consequences of the women's consumptions during pregnancy are medical, such as preterm birth, intrauterine growth retardation (IUGR), per partum hypoxia or neonatal abstinence syndrome (NAS) and also social, mainly poor parenting capacities, poor bonding, child protection reporting and foster care or adoption.

Later, the consequences include reports to child protection, foster care or adoption (Sarkola et al., 2007), schooling and learning difficulties, behavioral problems and social consequences such as delinquency or repeated imprisonment, especially in the case of fetal alcohol syndrome (FAS) disorders (Streissguth et al., 2004; Spohr et al., 2007). A higher degree of healthcare utilization is shown for exposed children, especially when fostered (Sarkola et al., 2011).

The works showed a high level of primary care disruption among children of heroin or cocaine abusing mothers (Nair et al., 1997). Works questioning the impact of both drug abuses during pregnancy and the effects of foster care were carried out in the 90's. The results show that the environment in which the children are raised is more important than the in-utero heroin exposure

(Ornoy et al., 1996). Studies following drug abusing women highlighted their increased risk of morbidity and mortality (Kahila et al., 2010), resulting in foster care for their children.

Recent studies show changes in the laws affirming the rights of children to be raised in their own families, as well as in the professionals' representations of drug abuse in pregnancy. Works from Street et al. compared the risk of child protection involvement in the children of drug users to controls, and showed the overall risks after birth and five years later. They did not include alcohol but illicit drugs and medications (Street et al., 2008). In the United States, the effects of drug use were compared to those of socio economic status and adoption: they showed that adoption even by higher socio economic status families do not mitigate the effects of drug exposure on the behavioral problems among adolescents (Ornoy et al., 2010).

Concerning the school performances of the children, a lot of studies exclude the question of alcohol, or even tobacco, alcohol and cannabis, to assess that children exposed to cocaine have similar IQ to those not exposed, and that the low results are to be blamed on social adversity (Wasserman et al., 1998). But these authors also remarked that the intelligence level of the mothers is hardly ever taken into account.

Numerous studies focused on behavioral problems, for instance after an OMT (Sundelin Wahlsten and Sarman, 2013), or on the link between drug abuse and ADHD. Comparing children exposed to street drugs and to alcohol, a study concluded that the first were somatically healthy but had an increased risk of ADHD (Elgen et al., 2007).

In this paper, we want to assess the influence of the combination of products and of the social conditions in which the mothers lived during their pregnancies, on the newborns' conditions at birth and a few years later, focusing on how many substances were used.

## Materials and methods

From 1999 to 2008 in a hospital in the suburbs of Paris, 170 neonates out of whom three were still-born from mothers reported as using at least two substances at the beginning of their pregnancies were included.

The women's maternity and "addiction" files formed the basis of the first data collected. When a mother had given birth in another hospital, data were sought in the relevant maternity ward. The database included 168 variables describing the

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