

CORRESPONDENCE

To the Editor: With great interest I read the recent article by Karmaus *et al.* in *Pediatric Research*, entitled "Early childhood determinants of organochlorine concentrations in school-aged children" (1). The authors investigated whether early childhood factors such as breast-feeding, parity, and maternal smoking during pregnancy contribute to the concentrations of several organochlorine compounds, including polychlorinated biphenyls (PCBs) and hexachlorobenzene (HCB), in children at approximately 7 years of age. They found a strong relationship between breast-feeding and the concentration of all organochlorine compounds investigated, whereas no systematic association was detected for birth order or maternal smoking. I have several concerns regarding these findings as well as the study design.

The study was conducted in the Federal State of Hessen, Germany, in 1994 and 1995. In the study population of 337 children, only 28 children (8%) were exposed to tobacco smoke during pregnancy (maternal smoking after 20 weeks of gestation). In contrast, the number of smoking mothers was estimated to be about 30% in the Perinatal Survey of the State of Hessen in 1996 (2). This significant difference in the number of smoking mothers is obviously the result of the restriction in the present study to parents who reported a consumption of 10 cigarettes per day or fewer. Parents smoking more than 10 cigarettes per day were excluded from the study design. Therefore, the study group presented by Karmaus *et al.* is not representative with regard to the influence of maternal smoking during pregnancy on organochlorine concentrations in the offspring.

The authors assert that neither maternal smoking during pregnancy nor passive smoking of children has any significant effect on organochlorine concentrations in children. Last year we could demonstrate a significant increase in the neonatal burden with PCBs and HCB in offspring of active and passive smoking mothers during pregnancy (3). Whereas these results were obtained from 80 full-term neonates born even in the State of Hessen in 1994–1995, we were recently able to confirm our findings in a large study group of 200 neonates born in 1998 (4). Having in mind the half-life of higher-chlorinated biphenyls, which are suggested between 3.3 and 5.6 years in humans (5), the prenatally increased body burden with PCBs and HCB due to maternal smoking during pregnancy should be vanished in 7- to 10-year-old children. Overall, the study presented by Karmaus *et al.* is not able to make reliable statements about maternal smoking during pregnancy and the later body burden with PCBs and HCB in the offspring.

The total PCB concentration (geometric mean) decreases from 0.43 $\mu\text{g/L}$ in 7-year-old children to 0.18 $\mu\text{g/L}$ in 10-year-old children in the study by Karmaus *et al.* This finding is inconsistent with all previous studies investigating the kinetics of PCBs in humans. The concentration of these organochlorine compounds in men increases steadily during lifetime, with the

lowest concentrations in children and the highest values in the elderly. Recently, the *Umweltbundesamt* has published actual reference values of PCBs in humans (6). Total PCB concentration was 1.3 $\mu\text{g/L}$ in 7- to 10-year-old children and 12.2 $\mu\text{g/L}$ in 56- to 65-year-old people. Furthermore, we were able to demonstrate actual reference values in neonates, which fit very well into the age-dependent reference values established by the *Umweltbundesamt* (7). The results obtained from Karmaus *et al.* need further critical discussion in face of these findings.

Last but not least, having again in mind the half-life of PCBs in humans (see above), it seems questionable that an increase of the body burden with PCBs during the 1st year of life due to breast-feeding will lead to a detectable elevation of these compounds 10 years later (8). The influence of breast-feeding on serum PCB concentrations should be investigated during the 1st year of life, thereby obtaining blood samples at different times up to 12 months of age. Such an investigation is currently under progress in our institution.

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Response

To the Editor: We thank Dr. Gerd-Michael Lackmann for debating our findings. We will respond point-by-point to his questions.