

Abstract

Teratogenic radiation effects:

Perinatal mortality and congenital malformations following Chernobyl

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Trends of perinatal mortality rates from Germany, Poland, and Ukraine were analyzed using logistic regression. In 1987, significant increases were observed in Germany as well as in Poland. To analyze monthly data, the cesium concentration in pregnant women was calculated using data of the cesium concentration in milk. Two peaks of cesium concentration were found that were associated with the observed two peaks of monthly perinatal mortality data with a delay of 7 ± 1 months. Infant mortality monthly data from Poland were analyzed with the same method. Again, a significant association with cesium burden of pregnant women was found using the time-lag of seven months determined from the German data. A non-linear dose-response was found with a strong upward curvature. Early neonatal mortality data from Zhytomyr oblast in Ukraine showed a highly significant increase in the first 6 months of 1987 relative to the trend of the data in 1985-91 without 1987, with peaks in January and April 1987. Monthly data of congenital malformations in Bavaria, 1984-91, did not show any association between radiation exposure and malformation rates seven months later. But a detailed analysis on a district level, found an association between malformation rates and the calculated cesium concentration in pregnant women. Again, a linear-quadratic model was applied to allow for a curvilinear shape of the dose-response. A strong upward curvature was found, with a negative linear and a positive quadratic cesium term. The results should be interpreted carefully as the analyses had been conducted as explorative observational studies. The results are not in line with the existence of a threshold dose for teratogenic effects of low level ionizing radiation.