## Retrospective dose estimation for individual exposed to accidental irradiation in uterus 16 years ago with FISH

Keywords Cytogenetics(FISH); Biodpsimetry; Retrospective dosimetry; Post accident dosimetry

## Summary

A fetal accident occurred in November 1992, in Xizhou City, north China's Shanxi Province. It killed a construction worker who picked up the abandoned 10-Curie Cobalt-60 source at his construction site and took it home. The worker, his father and brother died during 3 weeks. His wife, the four months pregnant mother, also suffered from a moderate acute radiation sickness with retardation of fetal development. After delivery, the infant's body length, body weight and head circumference were all lowered by three percentiles compared with those of the normal. Sixteen years later, the child still cannot do the simple addition or subtraction. It is needed to accurately estimate the absorbed dose for the child.

This study is to reconstruct the absorbed dose for individual who accidentally exposed to irradiation in uterus 16 years ago. Peripheral blood samples were drawn from the child and her mother. The dicentric and centric ring chromosome aberrations were analyzed with conventional method, the micronucleus was observed with cytokinesis-block micronucleus method, and fluorescence in situ hybridization (FISH) with chromosomes 1, 2 and 4 painting probes were used for translocation detection. Dose estimation was carried out according to the standard dose-response curves previously established in our lab. The results showed that no unstable chromosome aberrations and normal micronucleus frequencies were observed in two persons 16 years after the accident. According to the established dose-response curves with FISH in our lab, the residual irradiation doses for mother and daughter were 0.76Gy (95%CI was 0.41⊠1.00 Gy) and 0.61 Gy (95% CI was 0.44⊠0.86Gy), respectively. Because the biodose estimated for mother 1 month after the accident was 2.30 Gy (95% CI was 2.07⊠2.50Gy), the dose correction factor was 3.03 for dose estimation 16 years after. The estimation dose in uterus irradiation for case was 1.85 Gy (95% CI was 1.33⊠2.61Gy). The estimated dose for individual who accidentally exposed in uterus 16 years ago could be obtained according to the dose correction factor of mother with FISH method.

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