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EFFECTS OF CADMIUM CHLORIDE ON HUMAN FETAL CELLS IN VITRO

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Background and Aims

Cadmium is one of the ubiquitous heavy metal pollutants, classified as human carcinogen by the International Agency for Research on Cancer. It is employed in several production cycles, and therefore the fortuitous exposure of workers to high doses is frequent, as also the continuous exposure of large population groups to low environmental doses. Several models were so far used to test genotoxic or teratogenic effects of several chemicals, among these cultured cells from humans or from chinese hamster are the most used. The evaluation of effects of various substances on human cells is more frequently based on lymphocyte cultures from peripheral blood of healthy donors treated in vitro, or from people exposed in vivo to chemicals tested. The principal aim of our work was to demonstrate the feasibility of tests with substances known as teratogenic in vivo on cell types which are the real target of their teratogenic effects. To this purpose Cadmium chloride has been tested on human amniotic fluid cells using

the Chromosome aberrations (CA) and Sister chromatid exchanges (SCE) tests.

Methods

The amniotic fluid cells were collected from 10 patients who underwent amniocentesis for advanced maternal age. The cells were exposed to different doses of CdCl₂ for the last 24 h, then harvested according to routine methods. Chromosome aberrations were evaluated on QFQ banded chromosomes, while for sister chromatid exchanges the slides were stained according to the original method described by Perry and Wolff for differential staining of sister chromatids.

Results and Conclusions

We have positively assessed that amniotic fluid cells grown in vitro are reliable for testing genotoxic and teratogenic effects of chemicals. With regard to the specific tests with cadmium a clastogenic effect of cadmium chloride was demonstrated, while we did not find a significantly increased induction of SCE.