EPICHLOROHYDRIN (Group 2A)

A. Evidence for carcinogenicity to humans (*inadequate*)

A cohort study of 474 and 389 workers exposed in 1948-1965 and 1955-1965 to epichlorohydrin in two factories in Texas and Louisiana, USA, showed slight excesses of lung cancer. In one of the factories, six cases were observed, with 4.2 expected; four of these workers had also been engaged in the manufacture of isopropyl alcohol (see p. 229). In the other, four cases were observed, with 3.1 expected. None of these excesses was statistically significant, even after pooling the data on lung cancer[1].

Another cohort study of 606 workers exposed to epichlorohydrin and other chemicals in four European factories was inconclusive due to small cohort size and short follow-up. The expected number of all cancers was 5.0; four cases were found[2].

B. Evidence for carcinogenicity to animals (*sufficient*)

Epichlorohydrin was tested in rats by oral administration, inducing papillomas and carcinomas of the forestomach[3,4], and by inhalation, inducing papillomas and carcinomas of the nasal cavity[5]. It was also tested in mice by skin application and by subcutaneous and intraperitoneal injection; it gave negative results after continuous skin painting but was active as an initiator on skin. It produced local sarcomas after subcutaneous injection[6] and was active in a mouse-lung tumour bioassay by intraperitoneal injection[7].

C. Other relevant data

Epichlorohydrin is a bifunctional alkylating agent. Chromosomal aberrations have been observed in workers exposed to this compound, although the studies are difficult to interpret[8].

Epichlorohydrin induced sister chromatid exchanges in bone-marrow cells but not micronuclei or dominant lethal mutations in mice treated *in vivo*; equivocal findings were found for chromosomal aberrations. It induced chromosomal aberrations, sister chromatid exchanges and unscheduled DNA synthesis in human cells *in vitro*. Weakly positive results were obtained in a cell transformation assay in C3H 10T1/2 cells. It induced chromosomal aberrations, sister chromatid exchanges, mutation and DNA strand breaks in rodent cells *in vitro*. Epichlorohydrin induced sex-linked recessive lethal mutations in *Drosophila*; aneuploidy, mutation, recombination, gene conversion and DNA damage in fungi; and mutation and DNA damage in bacteria[8].

References

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