N,N-BIS(2-CHLOROETHYL)-2-NAPHTHYLAMINE (CHLORNAPHAZINE) (Group 1)

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

Among 61 patients with polycythaemia vera treated with chlornaphazine in 1954-1962 and followed until 1974, eight developed invasive carcinoma of the bladder, five developed papillary carcinomas of the bladder and eight had abnormal urinary cytology. The invasive carcinomas were seen in four of five patients treated with a cumulative dose of 200 g or more, in two of 15 patients given 100-199 g, in one of ten patients given 50-99 g and in one of 31 patients given less than 50 g. No noncausal explanation can be suggested[1].

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

Chlornaphazine produced lung tumours in mice following its intraperitoneal injection, and local sarcomas in rats after its subcutaneous administration[2].

C. Other relevant data

No data were available on the genetic and related effects of chlornaphazine in humans.

Rats administered chlornaphazine excreted metabolites of 2-naphthylamine (see p. 261) in the urine. Chlornaphazine induced chromosomal aberrations in Chinese hamster cells, mutation in mouse lymphoma cells and unscheduled DNA synthesis in rat hepatocytes *in vitro*. A single study of cell transformation in virus-infected Syrian hamster embryo cells was inconclusive. It induced sex-linked recessive lethal mutations and chromosomal aberrations in *Drosophila* and was mutagenic to bacteria[3].

References

[1]Thiede, T. & Christensen, B.C. (1975) Tumours of the bladder induced by chlornaphazine (Norw.). *Ugesk. Laeger, 137*, 661-666

[2]*IARC Monographs, 4*, 119-124, 1974

[3]*IARC Monographs, Suppl. 6*, 113-115, 1987