The topical application of 2,3,7,8-tetrachlorodibenzo-p-dioxin lacks skin tumor-promoting potency but induces hepatic injury and tumor necrosis factor-α expression in ICR male mice

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摘要

Abstract

One of the most toxic environmental pollutants known to man is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). There is growing evidence that indicates TCDD is a potent tumor promoter in rat and mouse liver, as well as in mouse skin. The mouse skin carcinogenesis model has been used extensively to assess whether a chemical or physical agent carries a carcinogenic hazard to humans and to define the mechanism involved with the carcinogenic effects. We applied the mouse skin model to ICR male mice and the results showed that following the application of DMBA, repeated dorsal application of all doses of TCDD produced no papillomas. These findings imply that the ICR male mouse is an extremely insensitive strain as a TCDD-induced two-stage mouse skin carcinogenesis model. However, severe hepatic injuries and wasting syndrome were seen in mice treated topically with TCDD. Meanwhile, serum TNF-alpha levels increased during the experimental periods. Inflammatory cell infiltration, fatty liver, and nodule formation could be observed in damaged livers. Elevated hepatic EROD activity and urinary 8-epi-PGF2alpha were also observed in mice with short-term exposure of TCDD.