

REDUCTION OF REPRODUCTIVE TOXICITY BY MIXED SOLVENT

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Abstract

Our recent epidemiological investigation on shipbuilding industries revealed that some workers experienced a mild decrease of leukocytes. The study further indicated that the workers had been exposed to various organic solvents such as aromates, alcohols, esters, ketones and ethylene glycols. In this study, we have attempted to find out the effect of mixed solvents on the reproductive toxicity induced by ethylene glycols. These chemicals (T, toluene; X, xylene; E, ethylene glycol mono ethyl ether), individual or mixed form, were tested through a 28 days of repeated dose experiment in male Sprague Dawley rats. Vehicle olive oil, E (150 mg/kg), T+X (250 + 500 mg/kg) mixed form, and E+T+X (150 + 250 + 500 mg/kg body weight) were administered orally for 28 days. After the experiment, blood was analyzed for biochemistry and hematology. Major organs were fixed, and examined by light microscopy. Although the rats treated with T+X showed a significant decrease in body weight gain, they did not show significant changes in hematology and decreases in organ weight gain including reproductive organs. Male rats treated with E showed significant decreases in body weight and testis weight, showing germ cell necrosis in the seminiferous tubules. The treatment with E also showed a significant decrease in the number of leukocytes. However, the rats treated with E+T+X showed moderate increases in body weight and testis weight without affecting the hematology, comparing with the rats treated with E only. This result suggested that the mixed solvent in our condition may cause an antagonistic effect, rather than additive or synergistic effect.

I. 서론

1. 연구배경

근래 조선업체의 근로자들에게서 유기용제의 폭로에 의한 조혈기장애 및 중추신경장애가 보고되었다 (부산일보 1996, 국민일보 1996, 한겨레신문 1996). 장애를 보인 근로자들은 도장부서에 특히 선행도장부에 근무하는 근로자들로서 ethylene glycol ether류를 포함하는 복합유기용제에 폭로되고 있었다고 하며 (김