[PA4-9] [04/17/2003 (Thr) 14:00 - 17:00 / Hall P]

Studies on the Nephrotoxic Mechanism of 3-MCPD

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3-Monochloro-1,2-propanediol (3-MCPD) produced during the acid hydrolysis of vegetable proteins (ex. soybean products) is food-contaminant material detected in acid-hydrolysed soy, bread, water, et al. 3-MCPD is currently being a matter of concern to safety. The nephrotoxicity of 3-MCPD and 3-MCPD metabolites has been reported to result from accumulating of metabolites in kidney tubules and inhibiting of renal metabolism of glucose and lactate. The major target organ of 3-MCPD toxicity is known to kidney, but the nephrotoxicity inducing mechanism of 3-MCPD has not yet been known. Therefore, we would observe the change of the nephrotoxicy on 3-MCPD single administration /co-administration with enzyme inducer and inhibitor and investigate about 3-MCPD metabolizing enzyme and neprhotoxicity inducing mechanism.
We administered for 2 weeks and 3 days in Sprague-Dawley rats with 3-MCPD(80mg/kg/day, 50mg/kg/day), 3-MCPD/phenobarbital (PB ; 30mg/kg/day, 80mg/kg/day ; cytochrome P450 Inducer), 3-MCPD/phenethyl isothiocyanate (PEITC ; 20mg/kg/day, 200mg/kg/day ; cytochrome P450 Inhibitor ; GST Inducer) and 3-MCPD/ N-acetyl cystein (NAC ; 50mg/kg/day, 300mg/kg/day ; GSH precursor) and observed body weight, relative kiney weight, BUN and creatinine value in blood, glucose and protein value, N-acetyl- -D-glucosaminidase (AGS) activity in urine, histopathology of kidney, hepatic cytochrome P450 and GSH contents.
The results are as follows. The nephrotoxicities induced by 3-MCPD were identified by body weight, relative kidney weight, BUN value in blood and histopathology of kidney. The main pathological lesion was tubule degeneration including vacuolation. As expected, we could observe increasement of hepatic cytochrome P450 contents by PB and increasement of hepatic GSH contents by PEITC and NAC. In 3-MCPD and PB co-administration group, we observed more severe toxicological finding in BUN value in blood, AGS value in urine and histopathology compared to 3-MCPD administration group. Meanwhile, we could observe that BUN value was recovered to control level by co-administration of PEITC and NAC. And the co-administration reduced toxicity in aspect the number of lesion compared to 3-MCPD administration group.
We concluded that 3-MCPD may produce toxicologically active metabolite by cytochrome P450 and the active metabolite may be eliminate by GSH. Hereafter, we consider that further studies are required to identify more detail metabolic mechanism of 3-MCPD.

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Naringenin Inhibits Dimethylnitrosamine-Induced Hepatic Fibrosis in Rats

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Naringenin, a phytoalexin found in grapefruit, has been reported to exhibit a wide range of pharmacological properties. The aim of the present study is to evaluate the protective effect of naringenin on hepatic fibrosis induced by dimethylnitrosamine (DMN) in rats.
Fibrosis was induced by intraperitoneal injection of DMN. Naringenin was given orally at 20 mg/kg and 50 mg/kg daily for 4 weeks. Naringenin treatment essentially prevented the DMN-