

Toluene coma and liver function

Table 1. Liver and kidney function tests of two humans with acute poisoning by toluene.^a (AST = aspartate aminotransferase, ALT = alaninoaminotransferase, γ GTP = gamma glutamyl transpeptidase, AL PH = alkaline phosphatase, LDH = lactate dehydrogenase, T BIL = total bilirubin, C BIL = conjugated bilirubin, BUN = blood urea nitrogen, CR = creatinine)

Day	AST (U/l)	ALT (U/l)	γ GTP (U/l)	ALPH (U/l)	LDH (U/l)	T BIL (mg/100 ml)	C BIL (mg/100 ml)	BUN (mg/100 ml)	CR (mg/100 ml)
<i>Patient 1</i>									
2 nd	62	14	.	.	.	.	.	.	.
4 th	55	40	.	.	.	.	.	13	.
5 th	67	—	.	69	233	0.95	—	.	.
8 th	30	29	20	57	174	0.60	.	12	0.9
<i>Patient 2</i>									
2 nd	35	47	.	.	.	.	.	.	.
4 th	33	45	.	.	.	.	.	22	.
5 th	47	.	.	57	224	1.0	0.45	.	.
8 th	29	41	40	58	179	0.7	.	20	1.0
14 th	14	.	.	53	153	0.5	.	.	.
Normal range	6—40	6—40	6—35	35—75	80—240	0.2—1.1	0.1—0.4	8—22	0.8—1.2

^a Conversion factors: Serum enzymes: 1 U/l = 16.66 nkat/l, total and conjugated bilirubin: 1 mg/100 ml = 17.1 μ mol/l, blood urea nitrogen: 1 mg/100 ml = 0.357 mmol/l, creatinine: 1 mg/100 ml = 88.4 μ mol/l.

In 1983 we reported two human cases of acute intoxication caused by occupational solvent exposure, in which we were able to study, for 5 consecutive days, the blood and alveolar desaturation of toluene (1). The two workers were found lying on the floor of their workplaces, which were polluted by a mixture of solvents, at about 2200 and were taken and admitted to a hospital at about 2400 still in a coma. The complete recovery from the coma occurred within 12 h after hospital admission.

We did not mention in this report what happened to the two workers with regard to the liver and kidney functions before complete clinical recovery.

To any epidemiologist or researcher interested in human hepatotoxicity of organic solvents, we wish to point out that, in the workers concerned, no impairment of liver and kidney function was observed during the complete recovery from the coma accident. Table 1 shows the results of the liver and kidney tests performed in the two cases of toluene intoxication. [Analyses were performed with an SMA II auto-

analyzer (Technicon Instruments Corp, Tarrytown, NY 10591).]

We were unable to find a reason to explain the lack of impairment of liver and kidney function in these two severe cases of acute intoxication, which after 36 h from admission to the hospital in an intensive care unit still presented a toluene concentration of 823—1 122 μ g/l (8.9—12.2 μ mol/l) in venous blood and one of 53—38 μ g/l (0.58—0.41 μ mol/l) in alveolar air.

References

1. Brugnone F, Perbellini L, Apostoli P, Locatelli M, Mariotto P. Decline of blood and alveolar toluene concentration following two accidental human poisonings. *Int Arch Occup Environ Health* 53 (1983) 157—165.

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