

Toxicology study of vanillin on rats via oral and intra-peritoneal administration

ABSTRACT

Vanillin is useful as anti-sickle cell anemia, anti-mutagen and anti-bacteria agent. However, vanillin must be administered at high concentration and cannot be oxidized by the upper gastrointestinal track of patients to be medically effective. In this study, we assessed the toxic effect of vanillin when administered in an un-oxidized form at high concentrations (150 and 300 mg/kg) via oral and intra-peritoneal injection. It was found that 300 mg/kg vanillin injection caused the rats to be unconscious without exerting any toxic effect on blood cells, kidney and liver. Besides, it showed blood protective property. Further analysis with GenomeLab GeXP genetic system on brain tissues showed that the expression of most xenobiotic metabolism, cell progression, tumor suppressor, DNA damage and inflammation genes were maintained at normal level. However, the expression of a few xenobiotic metabolism, cell cycle arrest and apoptosis genes were up-regulated by 5% ethanol injection. Nevertheless, when 5% ethanol was injected with the presence of vanillin, the expression was back to normal level. It is postulated that vanillin might have neuro-protective property. In conclusion, vanillin is not toxic at high concentration in both oral and intra-peritoneal injection and could provide blood and brain protective properties.

Keyword: Vanillin; Ethanol; Brain; Kidney; Liver; Blood cell