

Difference of acrylamide-inducing genotoxicity and adduct formation between child and adult rats

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Acrylamide (AA), a chemical in the fried or baked foods, induces mutagenic/carcinogenic activities to human. AA is relatively highly contained in foods that child like such as snacks and cereals, and baby foods. Therefore, it is important to elucidate the difference of genotoxicity of AA to child and adult.

We treated young (3 weeks) or adult (7 weeks) male rats (*gpt*-delta transgenic F344 or SD rats) with AA at the concentration of 20-80 or 50-200 mg/l of for 28days, followed by examined the genotoxicity in blood, liver and testis using comet, micronucleus and *gpt* mutation assays. We also analyzed the levels of DNA adducts (*N7*-GA-Guanine) derived from glycidamide (GA), which is a metabolite of AA, in liver, testis, mammary gland and thyroid gland.

It was observed the dose-related increases of micronuclei in peripheral blood of AA treated mice. DNA damage in liver was significantly induced by AA (at middle and high doses) treatment. However, *gpt* mutations were not confirmed in tissue samples of AA-treated rats.

On the other hand, testis of young rats showed the significant genotoxic response in the micronuclei test, comet assay and the *gpt* mutations test compared with adult rats. DNA adduct analysis revealed that *N7*-GA-Gua was significantly increased in testis and mammary gland of AA-treated young rats in a dose-dependent manner. The adduct level of testis treated with AA at the high dose was 8-folds higher in young rats than those in adult rats. There was no significant difference of genotoxicities in peripheral blood and liver of between young and adult rats. From these results, AA caused significant genotoxicity in only testis of young rats and it corresponded to the adduct level in testis. We should examine the germinal mutagenicity and reproductive toxicity of children exposed to AA through daily foods.