

## Abstract

With people's putting more emphasis on health in recent years, the harm from smoking and environmental tobacco smoke (ETS) on women is also marked. Especially, the harm on pregnant women may even affect their fetal. Tobacco contains many irritants and carcinogens, and nicotine is the most famous. And the main metabolite of nicotine within human's body is cotinine, whose half-life with human's body is longer than nicotine's, which is more suitable as the biomarker. This study discusses the associations of level of cotinine with the status of smoking in pregnant, which utilizes the comet assay as a index for DNA damage, analyzing whether or not there is interaction between smoking or ETS and gene polymorphism, and whether it would do damage to DNA in human's body.

We recruited 418 pregnant women from China Medical College Hospital, Taichung hospital, and Chung Shan medical university hospital since 2003/6 to 2004/5. Utilize questionnaire investigate pregnant women's age, education degree, job and smoke exposure status, and collect the blood and urine sample. We examined gene polymorphisms in CYP1A1, NAT2, GSTM1 and GSTT1 with PCR-RFLP, and use urine to exam cotinine level. 148 pregnant women produce and collect blood examined by comet assay at the same time measure the degree of DNA damages.

The subject are divided into smoking group, ETS group and non-smoking group with the status of smoking. Mean age of smoking group is 28.9 years old, the ETS group is 29.5 years old, the non-smoking group is 31.4 years old, show the significant difference ( $p < 0.0001$ ). Cotinine level of smoking group is  $2.2 \pm 4.0$  ng/ml, the ETS group is  $1.9 \pm 3.4$  ng/ml, the non-smoking group is

1.8±4.7 ng/ml, but shows no significant difference. Analyse in pregnant women's education degree , spouse's age , spouse's education degree ,etc, show the significant difference ( $p < 0.0001$  ). Genotypic polymorphisms analysis of CYP1A1, NAT2, GSTM1 and GSTT1, shows no significant difference between three group of smoke status.

DNA damage of smoke status and cotinine level analyse single variable logistic regression was used examine DNA damage levels for smoking, ETS, cotinine. The result showed that odds ratio of the smoke group is 4.8 times than non-smoking group, ETS group is 6.4 times than the non-smoking group, shows the significant difference. Odds ratio of High cotinine level group ( $> 75\%$ ) is 1.5 times than low cotinine level group ( $< 25\%$ ), medial cotinine level group (25~75%) is 1.4 times than than low cotinine level group, but shows no significant difference.

This study represents the first description of the use of comet assay as a biomarker to assess the level of DNA damage of smoke status in pregnant wamen. We found that smoking or ETS cause different levels of DNA damage. Although it is found dangerous when the analysis is combined smoking condition with genotypes, it have no significant difference . Moreover, when analyzing effect of cotinine on DNA damage, we also don' t find any significant difference.

Key words: pregnant, smoking, ETS, CYP1A1, GSTT1, GSTM1, NAT2,  
DNA damage, comet assay