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Smoking habits, waist-hip ratio and plasma triglyceride level as risk factors for oxidative DNA damage in lymphocyte evaluated using the Comet assay

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It is widely thought that continuous oxidative damage to DNA is a major contributor to the risk of cancer development. To elucidate the factors that affect DNA damage, we investigated the relationships between DNA damage and dietary habits, life styles, anthropometrical measurements and plasma lipid profiles. Blood samples were collected from 109 Korean healthy volunteers ages 19~28. Epidemiological information and anthropometrical measurements were collected in personal interviews. The oxidative DNA damage was determined using Comet assay and quantified by measuring comet tail length (TL) and tail moment (TM). Plasma lipid profiles were analyzed by automated enzymatic colorimeter. Statistically significant ($p<0.05$) positive correlations were observed between DNA damage (TM or TL) and smoking habits expressed as cigarettes smoked per day and pack years ($r=0.332$ and 0.370 for TM, $r=0.266$ and 0.304 for TL, respectively). There were also significant positive correlations between DNA damage parameters and waist-hip ratio ($r=0.352$ for TM and $r=0.226$ for TL). Higher plasma triglyceride levels were associated with an increased damage to DNA ($r=0.234$ for TM and $r=0.271$ for TL). The subjects who consumed fruits or fruit juice less have higher DNA damage. Our results suggest that cigarette smoking, waist-hip ratio, plasma triglyceride and low intake of fruits have the significant effects on DNA damage in peripheral lymphocytes of Korean population.