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The roles of human apurinic/apyrimidinic endonuclease/redox effector factor (APE1/Ref-1) in tumor diagnosis and related mechanism study

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Apurinic/apyrimidinic endonuclease/redox effector factor (APE1/Ref-1) is the major AP endonuclease in mammalian cells. It is a multifunctional protein which functions not only in DNA repair but also as a reduction-oxidation factor. Recently studies have showed that alteration of expression levels, cellular location and/or patterns of APE1/Ref-1 may consider as a good candidate in cancer screening and auxiliary diagnosis.

Interestingly, we found that expression of APE1/Ref-1 was significantly increased in tumor patients' serum. So we measured serum APE1/Ref-1 protein level in 210 healthy and 200 lung cancer patients by sandwich ELISA. Serum APE1/Ref-1 protein level was skewed distribution and significant increased in cancer patients ($P<0.05$). We also detected serum APE1/Ref-1 antibody in 345 lung cancer patients, 350 healthy donors and 91 monitor patients before and after chemotherapy by indirect ELISA. Serum APE1/Ref-1-Abs level of lung cancer patients was significantly higher than that of healthy donors and after chemotherapy ($P=0.000$). Both of APE1/Ref-1 protein and antibody combined with CEA, CA125 and CA242 can elevate the diagnostic sensitivity and correct rate. These results indicated that detection of APE1/Ref-1 in serum may be helpful in early diagnosis of malignant tumors and evaluating chemosensitivity. To explore the genetic association between SNP of APE1/Ref-1 and lung cancer susceptibility, we investigated a population based case control study among Chinese Han people in Chongqing City. Logistic regression analysis indicated that APE1 -141G/G genotype were reduced 38% risk of lung cancer compared with APE1 -141T/T genotype. APE1-141T/148Glu haplotype may serves as an important genetic susceptibility factor for lung cancer.