Association of genetic polymorphisms in DNA repair genes ERCC2 Asp312Asn (rs1799793), ERCC2 Lys 751 Gln (rs13181), XRCC1 Arg399 Gln (rs25487) and XRCC3 Thr 241Met (rs861539) with the susceptibility of lung cancer in Saudi population	
Authors	**Suliman Alsagaby , Ahmed A Ahmed , Zafar Rasheed , Sami A Althwab , Abdullah S M Aljohani , Fahad A Alhumaydhi , Homaidan T Alhomaidan , Abdullah S Alkhamiss , Mohammad Alkhowailed , Aqeel Alaqeel , Mohamd A Alblihed 11, Jihad Alrehaili , Nelson Fernández , Waleed Al Abdulmonem**
Publication Year	2022
Grant Number	
DOI link	https://doi.org/10.1080/15257770.2022.2052317

This study demonstrated the association of polymorphisms in *ERCC2* (Asp312Asn) rs1799793, *ERCC2* (Lys751Gln) rs13181, *XRCC1* (Arg399Gln) rs25487 and *XRCC3*(Thr241Met) rs861539 polymorphisms with a susceptibility of lung cancer (LC) onset in the Saudi population. The study was performed on 134 LC patients and 270 controls. The data revealed that there was no significant association of LC with subtype squamous cell carcinoma (SCC), small cell lung cancer (SCLC) and adenocarcinoma with the *ERCC2* rs1799793 polymorphism. The data showed that the CC genotype for *ERCC2* rs13181, the AA genotype for *XRCC1* rs25487, and the genotype TT for *XRCC3* rs861539 were significantly associated with SCC susceptibility ($p < 0.05$). Similarly, the CC genotype for *ERCC2* rs13181 and the AA genotype for *XRCC1* rs25487 were significantly associated with adenocarcinoma susceptibility ($p < 0.05$). Whereas, the TT genotype for *XRCC3* rs861539 was significantly associated with SCLC susceptibility ($p = 0.005$). In total, significant association of LC susceptibility was found in the following combination models of recessive genotypes: AC heterozygous for *ERCC2* rs13181 + AA homozygous for *XRCC1* rs25487, CC homozygous for *ERCC2* rs13181 + GA heterozygous for rs25487, CC homozygous for rs13181 + AA homozygous for *XRCC1* rs25487, CC homozygous for *ERCC2* rs13181 + TT homozygous for *XRCC3* rs861539, GA heterozygous for *XRCC1* rs25487 + CT heterozygous for *XRCC3* rs861539, GA heterozygous for *XRCC1* rs25487 + TT homozygous for *XRCC3* rs861539, AA homozygous for *XRCC1* rs25487 + CT heterozygous for *XRCC3* rs861539, AA homozygous for *XRCC1* rs25487+ TT homozygous for *XRCC3* rs861539. These data clearly demonstrated that the combination of recessive genotypes may be associated with susceptibility of LC onset ($p < 0.05$). In short, the data indicated that DNA repair genes increase LC risk via gene-gene interaction rather than independent variants.