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### **Higher TP53 somatic mutation prevalence from liquid biopsy analysis in ever smoker non-small-cell lung cancer patients**

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**Introduction:** Higher TP53 somatic mutation prevalence from liquid biopsy analysis in ever smoker non-small-cell lung cancer patients

**Material-Methods:** The study included 271 out of 340 NSCLC patients. Of the patients included in the study, 76 (28%) were women and 195 (72%) were men. In terms of smoking history, 111(41%) were ever smokers and 160 (59%) were never smokers. All patients provided blood samples for cfDNA extraction and analysis. The sequencing was performed on the Illumina MiSeq system (Illumina Inc., San Diego, CA, USA). The data were analyzed on the Archer Analysis Platform (ArcherDX, Inc., CO, USA) for the ArcherDx Reveal ctDNA 28 Kit and Sophia DDM software (Sophia Genetics, Saint -Sulp) for the Sophia Genetics 56G Oncology Solution. Visualization of the data was performed with IGV 2.7.2 (Broad Institute) software.

**Results:** There is a statistically significant difference between the frequencies of TP53 and PTEN mutations observed in smokers and non-smokers ( $p<0.001$  and  $p<0.001$ , respectively). Fifty-five (90.16%) of 61 patients with TP53 mutations were smokers. No statistically significant difference was found between smoking and TP53 mutation types ( $p=0.776$ ). Tier 1-2 variants are detected more frequently in smokers than Tier 3 variants, and a statistically significant difference was found between smoking and Tier categories of variants ( $p=0.019$ ).

**Conclusion:** Our study shows that TP53 mutations are highly associated with cigarette smoking. There was no association between the mutation types and cigarette smoking. While Tier I-II mutations are more common in ever-smokers, Tier III variants are most frequently seen in never-smokers.

**Anahtar Kelimeler:** lung cancer, smoking history, TP53 mutations