

عنوان مقاله:

Mitochondrial A12308G alteration in V-loop (tRNA Leu(CUN)) region is significantly higher in tumor

محل انتشار:

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خلاصه مقاله:

Introduction: Mitochondrial dysfunction is related to the genesis of many types of cancers, including breast cancer. Mitochondrial tRNA genes perform several functions including processing and translation in which are essential components of mitochondrial protein synthesis. Until now only few somatic mitochondrial tRNA mutations have been reported in cancer cells. The aim of this study was to find out the relationship between mitochondrial DNA mutations and breast cancer risk. **Methods and Materials:** In this study, all mitochondrial 22tRNA genes in 30 breast tumoral tissues, and surrounding adjacent non-tumoral tissues and 100 blood samples of healthy controls were investigated by using PCR-Sequencing methods. **Results & Discussion:** Twelve genetic variations were found (40%), 6 of them were novel (50%) and found in which C1631A(tRNA Val), T1633A(tRNA Val), A5565G (tRNA Trp), G5849A(tRNA Tyr), C12187(tRNA His) and A15948G(tRNA Thr), that were just found in tumoral tissues while other 6 alterations were reported as polymorphisms. Among them A12308G, a polymorphic mutation in V-loop (tRNA^{Leu}(CUN)), was found in 7 of 30 breast tumoral tissues (23%) and 3 of 100 healthy controls (3%), indicating a significant association of the A12308G mutation ($p < 0.05$) between tumoral tissues and healthy controls. This alteration was not found in adjacent non tumoral tissues. In addition, recently have been shown that breast cancer cell lines with the higher mutation frequency of A12308G are highly metastatic. **Conclusion:** It seems that, mt-tRNA alterations through their impacts on the tRNA structure, may cause mitochondrial dysfunction and affect the cells. A12308G polymorphism in tRNA^{Leu}(CUN) with higher frequency may consider as a pathogenic predisposition factor for the development of breast cancer risk.

کلمات کلیدی:

breast cancer, mitochondrial tRNA mutation, carcinogenesis

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