Genetic screening and early cancer prevention in familiar cancers

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Introduction: About 5-10% of cancers are thought to be inherited and mutation in breast cancer susceptibility genes-1 is reported in many cancers including breast cancer and ovarian cancer. Here, we present a combination of several different cancers in a family which seems to have a common defect in BRCA1 gene.

Material and Methods: A family with different cancer involvement referred to our Lab. The proband was a 40 years old woman with early diagnosis of breast cancer. Taking family history and evaluating the family pedigree demonstrated that different type of cancers were diagnosed in her close relatives including ovary Cancer (6 cases), breast cancer (3 cases), prostate cancer, brain Tumor, gastric cancer, liver cancer and larynx cancer. She was recruited and entire coding region of BRCA1 gene were sequenced using Sanger sequencing method. Sequencing results were checked against Breast Cancer Information Core database to find pathologic sequence variation.

Results: Proband case was a 40 years old woman with early diagnosis of invasive ductal carcinoma of right breast at age 34 years old. 5 years later due to the involvement of the other breast tissue she underwent a bilateral mastectomy surgery. In IHC study she was negative for ER, PR and Her2/neu. Sequencing analysis of all coding region of BRCA1 gene in proband case showed a 16 nucleotide insertion in Cd980 (exon 11) in heterozygote pattern. This mutation was present in one of her 4th degree relatives with diagnosis of ovary cancer at age 62 years old. Some of the healthy at risk family members, were also tested for this mutation. Proband's sister and also one of her 3rd degree relative (both 41 years old healthy women) were carrier of the same mutation in heterozygote state.

Conclusion: BRCA1 gene accounts for an important part of hereditary cancers and molecular investigation of the gene (and also BRCA2) could play an important role to make a better decision for early cancer screening and prevention in the family.