Genetic Epidemiology Study of Hereditary Breast Cancer in Thais by Next Generation Sequencing (NGS)

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Background: Hereditary breast and ovarian cancer syndrome (HBOC) is characterized by an increased risk for breast cancer, ovarian cancer (including fallopian tube and primary peritoneal cancer), and other cancers such as prostrate, pancreas, and skin (melanoma). HBOC is most commonly caused by mutations in one of two genes: BRCA1 and BRCA2. These genes are inherited in an autosomal dominant manner as having been reported approximately 1:500 to 1:1000 in Caucasians and 1:40 in Ashkenazi Jewish. Unfortunately, we have limited data in Asians and no data in Thai population to date.

Objectives: 1) To develop high throughput technique for BRCA test in Thailand for the most cost-effectiveness (rapid result and relatively low cost), 2) To educate and promote Thai people to have awareness of hereditary breast and ovarian cancer syndrome (HBOC), and 3) To study the incidence of HBOC in Thai population.

Methods: We enrolled 200 cases of Thai breast cancer in Ramathibodi Hospital for BRCA genes screening.

Results: Our preliminary report showed that some cases were found with mutation as previously reported. Few of them were novel mutations, causing out-of-frame or frameshift mutations, nonsense mutation or splicing site mutation. Many of them were noted with variant of uncertain significant (VUS).

Conclusion: Our preliminary result showed that the incidence of BRCA mutation in Thai breast/ovarian cancers is about 15%, or quite the same in all hereditary cancers (10-15%). Also, novel mutations could be common hot spots screening for Thai patients. Because the results of BRCA test are both positive and negative, they could be uninformative or unclassified (VUS) as well. Hence, pre- and post-test genetic counseling should be accounted in every case before BRCA test.

Keywords: HBOC, Genetic test, BRCA1/2 genes, Pre-/post-test counseling