Prevalence Of Retinoblastoma Protein Loss By Immunohistochemistry In Tripple-negative Breast Cancer

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**Background:** Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer with a high rate of recurrence and poor survival. However, the response to treatment with chemotherapy is generally high comparing to the other breast cancer subtypes. Previous study has showed that loss of retinoblastoma protein (pRB) expression in tumor tissue may play an important role in determining the prognosis and response to treatment of breast cancer including TNBC. In this study we characterized the expression rate of pRB in Thai TNBC patients.

**Objective:** Our primary objective is to determine the prevalence of loss of expression of retinoblastoma protein in TNBC tumor tissue. The secondary objective is to find an association between the loss of pRB and clinical parameters.

**Method:** Breast cancer patients who had been treated at the King Chulalongkorn Memorial Hospital during 2006-2010 were enrolled. Tumor tissue from 72 patients whose tumor cells had expression of estrogen receptor (ER) and progesterone receptor (PR) less than 10% and negative amplification of Human Epidermal Growth Factor Receptor type 2 (HER-2) by immunohistochemistry (IHC) or fluorescent in situ hybridization (FISH) were collected to manually construct tissue microarray (TMA). Expression of pRB was performed by IHC on TMA with anti-RB monoclonal antibody clone 1F8. All clinical parameters were reviewed and collected from available medical records.

**Results:** Of the 72 TNBC tumor tissues analyzed, there were 46 samples (64%) showed no expression of pRB. There were more high risk features; i.e. younger age, histological grade 3 and higher proliferative index, in the patients whose tumor tissues showed undetectable pRB. At the study cut off, the patients with loss of pRB had a longer estimated disease or progression free survival (DFS or PFS), not reached, compared with 10 months of patients with presence of pRB expression (p = 0.13 and 0.03 at 2 and 3 years respectively). In patients who received preoperative chemotherapy, there were higher rate of pathological complete response in patients lacking of pRB than the patients expressing pRB, 33% and 20% respectively (p=0.604).

**Conclusion:** The prevalence of pRB loss in Thai TNBC patients is significantly higher than the previously reported in other population. Loss of pRB may serve a potential predictive and prognostic biomarker among TNBC patients. A larger population and longer follow up cohort are highly warranted.