Journal of Oncological Sciences 4 (2018) 106–107

Contents lists available at ScienceDirect

Journal of Oncological Sciences

journal homepage: https://www.elsevier.com/locate/jons

Is there an association between CRP levels and tumor size in breast cancer patients?

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ARTICLE INFO

Article history:
Received 4 April 2017
Received in revised form
10 August 2017
Accepted 22 August 2017

Keywords:
CRP
Tumor size
Breast cancer

To the editor,

C-Reactive Protein (CRP) is an acute phase protein that rises in response to acute inflammation, infection and tissue damage. It has also been shown to be modestly elevated during chronic inflammatory diseases and malignant conditions.[1] It is produced by the liver in response to IL-6 secreted from the inflammation site. It has been reported in many cancers that malignant change either arises at sites of chronic inflammation or itself triggers inflammatory responses. Cancer invasion induces inflammation thus, CRP levels have been reported to be higher in invasive cancers than in non-invasive cancers.[2]

CRP levels have been reported to be associated with poor prognosis of endometrial, cervical, colorectal, pancreatic, hepatocellular, esophageal, renal cell, bladder, prostate, ovarian and non-small cell lung cancer. In the case of breast cancer prognosis, the role of CRP levels has not been clearly defined. The results of prospective epidemiological studies performed are conflicting, some showing an association between elevated CRP levels and poor prognosis and other showing no association. The study performed at our institute is to find the association between tumor size and CRP levels at the time of diagnosis.

Of the 2578 breast cancer patients followed up at our institute, 1253 patients without any chronic inflammatory or rheumatoid disease, and whose CRP levels were detected at the time of diagnosis were chosen for this study. Jonckheere-Terpstra trend analysis has been used to compare the groups. For the 1253 patients, the median follow-up period was 24.7 months. Patient age at diagnosis was 50 ± 12. 583 (46.5%) of the patients were pre-menopausal land 563 (44.9%) post-menopausal. The patients were grouped according to their tumor sizes (T1-T4). 377 (30.1%) of the patients had T1 tumor, 596 (47.6%) T2, 207 (16.5%) T3 and 65 (5.2%) T4. The median CRP level for all patients at diagnosis was 0.4 mg/dl (min-max: 0.1–27 mg/dl). A positive association between tumor size and CRP levels has been observed (J-T test, $p < 0.05$). The median CRP levels were 0.36 mg/dl, 0.40 mg/dl, 0.42 mg/dl, 0.57 mg/dl for T1-T4 tumors, respectively (Table 1).

Chung Hwan Jun et al. found a correlation between tumor diameter and high serum CRP levels in hepatocellular carcinoma patients. Patients with tumors with a diameter of 5 cm and over

Table 1
Patient's tumor size and CRP levels.

Number of Patients (n)	1253
Age at Breast Cancer Diagnosis	50 (38–62)
Menopausal Status (n,%)	
Pre-menopausal	583 (46.5%)
Post-menopausal	563 (44.9%)
Tumor Size (n,%)	
T1	377 (30.1%)
T2	596 (47.6%)
T3	207 (16.5%)
T4	65 (5.2%)
Median CRP Levels	
T1	0.36 mg/dl
T2	0.40 mg/dl
T3	0.42 mg/dl
T4	0.57 mg/dl

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Peer review under responsibility of Turkish Society of Medical Oncology.

https://doi.org/10.1016/j.jons.2017.08.004

had a higher mortality rate.[3] In a study of non-small cell lung cancer patients, JinGu Lee et al. demonstrated a correlation between increased CRP ratios independent from pathological lymph node status and increased CRP levels. Lymphovascular invasion, pathological tumor diameter, and increased CRP levels were identified as prognostic factors. Pre-operative increased CRP levels were found to be correlated with poor prognosis.[4]

A positive association between CRP levels and tumor size has been reported in colon cancer whereas, such as association has not been defined clearly for breast cancer previously.[5] In our study, CRP levels have been observed to be predictive for the tumor size. This positive association between CRP levels and tumor size in breast cancer may be used to predict the extent of cancer in a patient's body. A better understanding of the tumor extent gives an indication about prognosis, helps us plan the treatment and assists in the evaluation of the results of the given treatment.

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