

SHORT COMMUNICATION

# Can IgA, C3, IL-6 and TNF- $\alpha$ act as predictors for reoccurrence of breast cancer among Iraqi women?

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## ABSTRACT

Blood samples were collected from 30 women with age ranged from 27 – 70 years after 3 cycles of chemotherapy. Sera were used for IgA, IgG, IgM, C3, C4, IL-6 and TNF- $\alpha$  estimation. After 3 cycles of chemotherapy, all the immunological parameters reduced except TNF- $\alpha$ . Patients who developed disease reoccurrence after chemotherapy exhibit a significantly higher IgA, C3, IL-6 and TNF- $\alpha$  levels after 3 cycles of chemotherapy than patients who did not ( $p < 0.05$ ). Therefore, serum IgA, C3, IL-6 and TNF- $\alpha$  can be used as predictors for breast cancer reoccurrence.

Keywords: Breast cancer, Complements, Immunoglobulines, Interleukines, Women

Following an activating stimulus, CD4+T-helper cells that are Th1-polarized secrete IFN- $\gamma$ , TNF- $\alpha$ , IL-2, and IL-12,<sup>1</sup> which in turn induce upregulation of antigen processing, can induce expression of MHC class I and II molecules, and can induce other antigen display cofactors in neoplastic cells. Th1 CD4+T-helper cells also enhance antitumor immune responses by secretion of INF- $\gamma$ , which in turn induces activation of macrophage cytotoxic activity.<sup>2</sup>

Serum IgA, IgG, IgM, C3, C4, IL-6 and TNF- $\alpha$  were measured for 30 women, aged 27 – 70 years.<sup>3,4</sup>

Serum IgA was significantly higher in patients who developed recurrence than patients who did not ( $p < 0.05$ ) (Table 1). Patients who developed recurrence exhibited a lower IgM level ( $158.81 \pm 49.20$  mg/dl) than those who did not ( $185.58 \pm 68.40$  mg/dl). However, it was statistically not significant (Table 1). A significantly higher C3 level ( $209.68 \pm 71.71$  mg/dl) was observed in patients who developed disease recurrence than those who did not ( $151.77 \pm 42.78$  mg/dl) ( $P < 0.05$ ) (Table 1).

Table 1. Immunological parameter after three cycles of chemotherapy of the patients who developed recurrence and patients who didn't develop recurrence.

Parameter	Recurrence group (mean $\pm$ S.D)	Non recurrence group (mean $\pm$ S.D)	Significance
IgG (mg/dl)	1483.36 $\pm$ 711.73	1213.57 $\pm$ 511.03	NS
IgA (mg/dl)	529.38 $\pm$ 123.77	327.36 $\pm$ 180.58	<0.05
IgM (mg/dl)	158.81 $\pm$ 49.20	185.58 $\pm$ 68.40	NS
C3 (mg/dl)	209.68 $\pm$ 71.71	151.77 $\pm$ 42.78	<0.05
C4 (mg/dl)	43.68 $\pm$ 22.26	31.62 $\pm$ 11.65	NS
IL-6 (pg/ml)	284.16 $\pm$ 33.97	191.58 $\pm$ 74.78	<0.05
TNF- $\alpha$ (pg/ml)	484.32 $\pm$ 357.02	166.41 $\pm$ 122.88	<0.05

Patients who developed recurrence exhibit a higher C4 level than patients who did not; but it was statistically not significant (Table 1). Patients who developed recurrence exhibit a significantly higher IL-6 level (284.16  $\pm$  33.97 pg/ml) than those who did not (191.58  $\pm$  74.78 pg/ml) ( $P < 0.05$ ) (Table 1).

Patients who developed recurrence showed a significantly higher TNF- $\alpha$  level (484.32  $\pm$  357.02 pg/ml) than those who did not (166.41  $\pm$  122.88 pg/ml) ( $P < 0.05$ ) (Table 1).

The IgA elevation reflects the load and activity of the malignant cells through host immune modulation or secretion of IgA by their own cells. This gives serum IgA a novel role in breast cancer patients prognosis. Since complement system has been activated through the calssical pathway,<sup>5</sup> C3 can be beneficial in breast cancer

prognosis and patients follow up during chemotherapy. IL-6 has an important role in tumour growth and metastasis and can illustrate the extent and the subclinical spread of the disease. Thus, IL-6 can be an important prognostic and predictive marker, as well as a vital treatment target in breast cancer patients. There is significant greater TNF- $\alpha$  level for patients who develop recurrence, in comparison to those who did not. That would be in consistence with the work of Nenova et al.,<sup>6</sup> who revealed that cancer recurrence for patients exhibited TNF- $\alpha$  enhancement after third chemotherapy cycle. Therefore, serum TNF- $\alpha$  could be used clinically as a useful tumour marker for disease extent and outcome of breast cancer. In conclusion, serum IgA, C3, IL-6 and TNF- $\alpha$  can be used as a predictors for breast cancer recurrence.

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