

## SIGNIFICANCE OF SERUM CONCENTRATION OF CA 15-3 IN BREAST CANCER

M. Kemal ATTILA\*, Özogul SARGIN\*\*, Semra PAYDAŞ\*\*\*, Mustafa KİBAR\*\*\*\*

### ÖZET

Meme kanserinin teşhis ve takibinde CA 15-3'ün önemini belirlemek için, 17'si erken, 7'si ileri evre olmak üzere toplam 24 meme kanserli hastada serum CA 15-3 düzeyleri RIA yöntemiyle tayin edildi. İleri evre meme kanserli hastaların % 86'sında, erken evre meme kanserli hastaların ise % 18'inde serum CA 15-3 düzeyleri yükselmiş ( $>40$  U/ml) olarak bulundu. Kontrol grubu olarak alınan 6 normal kişinin ise hiçbirinde serum CA 15-3 düzeyi 20 U/ml nin üzerinde bulunmadı. Bu çalışmada, CA 15-3 düzeyinin erken evre meme kanserinin teşhisinde sınırlı bir değere sahip olduğu, fakat bu hastalarda metastazın tesbitinde ve/veya bu hastaların takibinde faydalı olabileceği sonucuna vardı.

**Anahtar Kelimeler:** Meme kanseri, CA 15-3, Serum

### SUMMARY

#### SIGNIFICANCE OF SERUM CONCENTRATION OF CA 15-3 IN BREAST CANCER

Serum levels of (carcino-antigen) CA 15-3 were evaluated in 24 patients with breast cancer (17 with early stage and 7 with advanced stage) in order to determine the value in the diagnosis and follow-up of breast cancer. Raised CA 15-3 levels ( $>40$  U/ml) were found in 18% of the patients with early stage breast cancer and in 86% of the patients with advanced stage, and none of the 6 normal control volunteers had levels of CA 15-3  $> 20$  U/ml. In this study, CA 15-3 was found to have a limited value for the diagnosis of early stage breast cancer but may be useful to determine the metastasis and/or follow-up of patients.

**Key Words:** Breast Ca, CA 15-3, Serum

\* Çukurova University Faculty of Medicine, Department of Nuclear Medicine (Research Fellow)

\*\* Çukurova University Faculty of Medicine, Department of Nuclear Medicine (Associate Prof)

\*\*\* Çukurova University Faculty of Medicine, Department of Oncology (Associate Prof)

\*\*\*\* Çukurova University Faculty of Medicine, Department of Nuclear Medicine (Research Fellow)

## INTRODUCTION

Cancer-associated antigens found in the serum of patients with cancer can be useful markers for the diagnosis and monitoring of cancer. However, the specificity of tumor markers is generally poor, because of a large number of non-cancer disease give false positive results (1). For instance, CA 15-3 has been found to be moderately raised in some benign diseases, such as cirrhosis, hepatitis, fibrocystic diseases of the breast and other malignancies such as carcinoma of the ovary, lung and pancreas (2, 3). Although carcinoembryonic antigen (CEA) was the most widely used marker for this purpose, because of its limited value that the incidence of raised CEA levels in patients with breast cancer has been reported as less than 25% of patients with early stage and 50% of patients with advanced stage, this marker has not been found to be useful for the diagnosis and management of breast cancer (4, 5, 6, 7). For this purpose, an ideal marker in the patients with breast cancer has not yet been described. CA 15-3 is a carbohydrate antigen with a glycoprotein, defined by two monoclonal antibodies (115D8 and DF3 (2). 115D8 was developed by Hilkens et al (1984) and DF3 was developed by Kute et al (1984) (8, 9). Raised CA 15-3 levels in patients with breast cancer have been found 3% for early stage and 82% for metastatic tumor. In addition, the sensitivity and specificity in detecting breast cancer were 47% and 95% for CA 15-3, respectively (10).

The aim of our study was to investigate the value of CA 15-3 in the diagnosis and monitoring of patients with early and advanced stage breast cancer.

## MATERIALS AND METHODS

Serum samples were collected at Çukurova University, Faculty of Medicine Hospital from 24 patients with histologically proven breast cancer (17 with early stage and 7 with advanced stage with proven metastases on the bone scintigraphy).

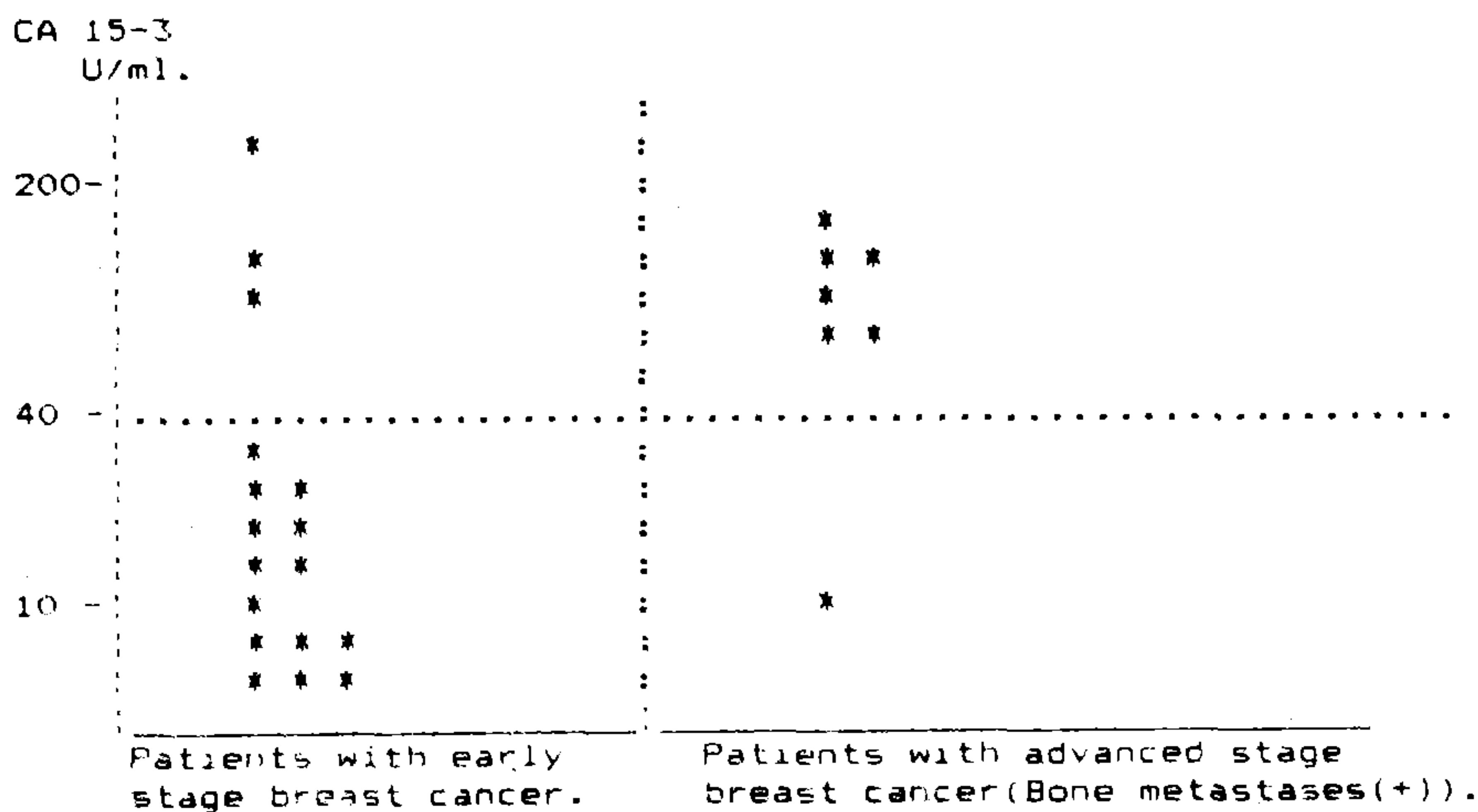
These serum samples were obtained from the patients immediately before or shortly after mastectomy and stored at -20°C until assayed. CA 15-3 levels were determined by the radioimmunoassay (Centocor, Amersham Corp., USA). Serum samples were also obtained from 6 normal control volunteers. Normal reference value and cut-off value were assigned 13 $\pm$ 7.9 U/ml and 40 U/ml for the CA 15-3, respectively.

## RESULTS

Serum levels of CA 15-3 were evaluated in 24 patients that 17 with early stage and 7 with advanced stage that proven metastases on the bone scintigraphy and in 6 normal control volunteers. Raised CA 15-3 ( $>40$  U/ml) were found in 18% (3 patients) and in 86% (6 patients) of patients with early and advanced stage breast cancer, respectively (Table I, Figure 1). None of the 6 normal control volunteers had levels of CA 15-3  $>20$  U/ml. (normal reference value).

**Table I: Results of CA 15-3 Assay in Patients with Breast Cancer.**

	<40 U/ml.	>40 U/ml.
<b>Early stage breast Cancer. (17 Patients)</b>	14 (82.4%)	3 (17.6%)
<b>Advanced stage breast Cancer. (7 Patients with bone metastases)</b>	1 (14.2%)	6 (85.8%)
<b>Early+advanced stage breast Cancer. (Total 24 patients).</b>	15 (62.5%)	9 (37.5%)
<b>Control (6 Volunteers)</b>	6 (100%)	0 (0%)



**Figure 1. Levels of CA 15-3 in Early and Advanced Stage Breast Cancer.**

## **DISCUSSION**

In our study, the value of CA 15-3 was investigated in the diagnosis and management of treatment in the patients with early stage before

treatment and with advanced stage breast cancer that found metastases on bone scintigraphy during the monitoring after mastectomy.

Serum levels of CA 15-3 were found to be normal in 14 of the 17 patients (82%) with early stage breast cancer. These results suggest that the CA 15-3 will not be a useful adjunct in diagnosing early breast cancer. In an earlier study, the assays performed on serum samples taken from 34 patients with stage I and II disease before mastectomy showed that only one patient had a raised CA 15-3 level ( $>40$  U/ml) (10). Serum levels of CA 15-3 were found markedly raised in 6 of the 7 patients with advanced stage that found metastases on the bone scintigraphy and only one had level of CA 15-3  $<40$  U/ml. These results showed that CA 15-3 determination appears especially valuable in following the patients with advanced stage. Sacks et al reported that raised CA 15-3 levels ( $>40$  U/ml) were found in 82% of stage III and IV patients with breast cancer (10).

Our study has shown that monitoring CA 15-3 level changes may be most useful in the follow-up and treatment of patients with metastatic disease in the bones.

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