

## SIGNIFICANCE OF TUMOR MARKER CA15-3

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### Summary

In the postoperative course of breast tumor treatment, along with regular ultrasound and radiological assessments, measurements of tumor marker CA 15-3 levels are also used. The levels of tumor marker CA15-3 are of particular significance in the follow-up of patients with metastatic breast cancer.

In this paper, the correlation between the tumor mass and the level of tumor marker CA 15-3 is confirmed (1,2).

KEY WORDS: *breast tumor, tumor marker CA15-3, prognostic factors*

### ZNAČENJE TUMORSKOG MARKERA CA 15-3

### Sažetak

U postoperativnom tijeku uz redovitu ultrazvučnu te radiološku obradu pacijentice, koriste se i vrijednosti tumorskog markera CA 15-3. Vrijednosti tumorskog markera CA 15-3 osobito su važne u praćenju bolesnica s metastatskim karcinomom dojke.

I u ovom radu potvrđena je korelacija između tumorske mase i razine tumorskog markera CA 15-3 (1,2)

KLJUČNE RIJEČI: *tumor dojke, tumorski biljeg CA 15-3, prognostički faktori*

## MATERIAL AND METHODS

### Patients

The paper is based upon a retrospective study of 200 breast cancer patients treated at the Department of Surgical Oncology of the University Hospital for Tumors, Zagreb, Croatia in the two-year period, during 2001 and 2002. The study included only the patients with histologically confirmed invasive ductal breast carcinoma (NOS "not otherwise specified"), undergoing modified radical mastectomy.

### Measurements of tumor marker CA 15-3

The tumor marker CA 15-3 belongs to the group of circulating mucin-like glycoproteins that

can be identified by an immunohistochemical method which is strictly specific, i.e. Microparticle Enzyme Immunoassay (MEIA). The analysis was performed using the AxSYM Immunoassay System of Abbott Laboratories (3,4).

## RESULTS

Tests for the tumor marker CA 15-3 were positive ( $>28 \text{ j/mL}$ ) and negative ( $<28 \text{ j/mL}$ ) in 53 (26.5%) and 147 (73.5%) of the patients, respectively.

A statistical analysis of the relationship between the tumor size and tumor marker CA 15-3 showed that the increase of tumor size was ac-

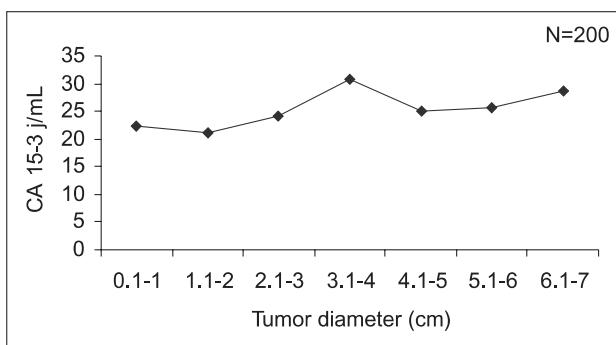


Figure 1. The relationship between tumor diameter and tumor marker CA 15-3 levels.

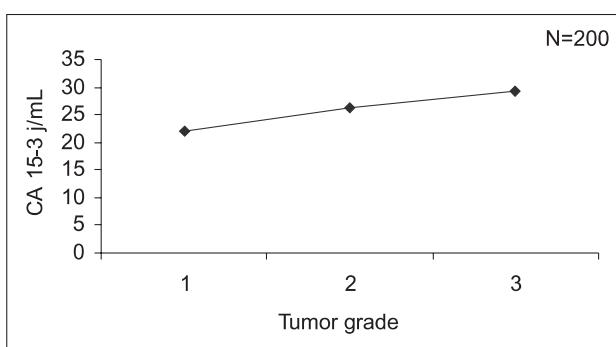


Figure 2. The relationship between tumor grade and tumor marker CA 15-3.

accompanied with a tendency towards increased levels of the tumor marker CA 15-3.

The correlation was moderate,  $r=0.644$ ,  $p<0.0001$  (Figure 1).

An analysis of tumor grade and tumor marker CA 15-3 showed higher plasma CA 15-3 levels in patients with high-grade tumors. The correlation was very strong,  $r=0.995$ ,  $p=0.06$ .

An analysis of the relationship between tumor marker levels and the number of positive lymph nodes showed a strong correlation,  $r=0.912$ ;  $p<0.001$ ; the same result was obtained correlating the tumor marker CA 15-3 with the tumor grade,  $r=0.995$ ;  $p=0.06$ , while its correlation with the tumor diameter was moderate,  $r=0.644$ ;  $p=0<0.0001$ .

The tumor marker did not correlate with age,  $r=0.143$ ,  $p<0.0001$ , neither was there any correlation with estrogen,  $r=0.003$ ,  $p>0.0001$ , nor with progesterone receptors,  $r=0.005$ ,  $p<0.001$ .

## DISCUSSION

The follow-up of patients after adjuvant treatment include periodic clinical examinations every 6 months in combination with ultrasonic and mammographic imaging every 12 months and laboratory tests (SE, CBC, AST, ALT, GGT, bilirubin, alkaline phosphatase) twice a year. To be on the safe side and possibly indicate additional treatment, the University Hospital for Tumors protocol includes routine analysis of the tumor marker CA 15-3 to be done 1 to 2 times a year. The marker is of particular significance in patients with metastatic breast cancer (5).

The analysis of the relationship between tumor diameter and CA 15-3 levels demonstrated an increased tumor diameter related to a tendency for an increase in CA 15-3. The observed correlation was moderate,  $r=0.644$ ,  $p<0.0001$ .

The increase of tumor marker levels occurs parallelly with the enlargement of tumor mass, or with the development of metastatic disease, which in our case, too, was related to the increase of tumor size (3).

Measurements of the tumor marker CA 15-3 are in the first place a useful tool in the follow-up of breast cancer patients. In 75-80% of patients with metastatic breast disease, the levels of CA 15-3 are increased (7). In our study group, 25% of the patients were positive for CA 15-3, or 55% of patients with regional lymph node metastases, which is slightly less than in the previous study. Likewise, this study corroborates the fact that tumor marker levels increase with the tumor mass enlargement and the development of metastases (3,4,6).

## CONCLUSION

The analysis of the relationship between the tumor marker and the number of positive lymph nodes demonstrated a strong correlation,  $r=0.912$ ;  $p<0.001$ ; the same result was obtained when correlating the tumor marker CA 15-3 with the tumor grade,  $r=0.995$ ;  $p=0.06$ , while the correlation of CA 15-3 with the tumor diameter was moderate,  $r=0.644$ ;  $p=0<0.0001$ .

The study substantiates the association between the increase of tumor marker levels and the enlargement of tumor mass that may be used

as an orientational factor in the follow-up of patients treated for breast cancer.

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