

Correspondence

Correlation does not always show a causal relationship

To the Editor

We have read the article by Homaei-Shandiz F et al.¹ It has already been shown that the tumors over-expressing HER-2 have a higher metastatic tendency and a poor prognosis.² We would like to make a few comments about this article. First, the authors have reported that HER-2-positive breast tumors are possibly associated with higher frequency of nodal metastases; however, they could not find a significant association ($p=0.538$). They reported that this is possibly due to the small sample size. We agree with this comment since there have been large studies showing this relationship.^{2,3} Second, the authors have concluded that there is a relationship between tumor size and the HER-2-positive breast cancer. We do not agree with this conclusion such that, 1) the relationship that the authors mentioned did not reach a statistically significant value, and the sample size was not sufficient to draw this conclusion; 2) in recently published large studies, HER-2 and tumor size were shown to be independent, predictive factors for lymph node metastases.³ We cannot concur with the result that “tumor fractions larger than 5 cm tended to have higher rates of HER-2 overexpression”, meaning that HER-2-positive tumors have a higher probability of having greater tumor size. This is, statistically, a true result, however, we believe that the authors’ comment is wrong. Statistics can allow misleading interpretation of the data. This is probably the case, in this study, as HER-2-positive tumors are more aggressive than the negative ones, and the tumors are diagnosed at relatively higher stages. As the tumor size increases, the HER-2 overexpression does not change. It is the same, whether the tumor size is small or large. In summary, if the HER-2-positive tumors are diagnosed at later stages, we can find a positive correlation between HER-2-positive

tumors and the tumor size, however, every correlation does not indicate causality.

*Hakan Buyukhatipoglu
Yavuz Pehlivan
Ramazan Geyik
Celalettin Camci
Gaziantep University School of Medicine
Gaziantep Oncology Hospital
Gaziantep, Turkey*

Reply from the Author

I read the attached correspondence on our paper, which was published in the Saudi Medical Journal. Although we did not find statistical relationship between lymph node-positive patient and HER-2/neu, we agree with their comment that correlation does not always show a casual relationship, prospective studies with a large number of patients are necessary to determine the prognostic significant of HER-2/neu and tumor size, specially amplification of HER-2/neu has been noted among in situ carcinoma as well, and HER-2/neu over expression may identify in women with small size tumor (> 2 cm) and lymph node negative, who are likely to experience early recurrences.

*Fatemeh H. Shandiz
Omid Hospital
Mashhad, Iran*

References

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