RESEARCH HIGHLIGHTS

MUTATION STATUS AND TREATMENT RESPONSE

Patients with breast cancer who carry mutations in the *BRCA1* and *BRCA2* genes have higher response rates to induction chemotherapy and radiotherapy than noncarriers, a new study suggests. Following induction therapy, carriers were more likely to be candidates for breast-conserving treatments than their noncarrier counterparts, Fourquet *et al.* report.

Induction chemotherapy and radiotherapy can decrease tumor size in patients who present with breast tumors too large for breast-conserving surgery. Mutations in *BRCA1* and *BRCA2* are associated with impaired repair of DNA damage, such as double-strand breaks caused by chemotherapy and radiotherapy. Fourquet and colleagues postulated that patients with breast cancer who carry mutations in these genes might be more sensitive to such treatments than patients without the mutations.

The investigators assessed the clinical response to chemotherapy and radiotherapy in 90 patients with a family history of breast and/or ovarian cancer. Genetic testing revealed that 28 patients carried a mutation in the *BRCA1* gene and 9 carried a mutation in the *BRCA2* gene. A total of 74 tumors were treated with induction chemotherapy; a complete clinical response was observed in 15 of 33 *BRCA1* and *BRCA2* mutation carriers compared with 7 of 41 noncarriers. Of the 19 tumors treated with induction radiotherapy all 6 tumors in *BRCA1* and *BRCA2* mutation carriers had a complete or major response, compared with 7 of the 13 nonmutated tumors.

Consequently, breast-conserving treatments were carried out in 85% of the mutation carriers and 54% of noncarriers in the chemotherapy group, and in 82% and 63%, respectively, in the radiotherapy group. The researchers conclude that these results should be confirmed in larger studies.

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Original article Fourquet, A. *et al.* Familial breast cancer: clinical response to induction chemotherapy or radiotherapy related to *BRCA1/2* mutations status. *Am. J. Clin. Oncol.* **32**, 127–131 (2009).