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Contrast-Enhanced Mammography in Breast Cancer Screening: the RACER Trial

Breast cancer screening is a crucial public health initiative aimed at early detection of breast malignancies. In many countries, including the Netherlands, mammography is a primary screening tool. Women recalled after an abnormal screening face additional imaging and diagnostic procedures, often increasing anxiety and healthcare costs. Contrast-enhanced mammography (CEM) has emerged as a promising alternative to traditional imaging methods such as full-field digital mammography (FFDM) and digital breast tomosynthesis (DBT). The RACER trial, a multicentre, randomised controlled trial, was conducted to evaluate the efficiency and accuracy of CEM compared to conventional imaging methods in women recalled for further assessment following an initial breast cancer screening. A recent Lancet Regional Health Europe article explores the RACER trial's outcomes and how CEM could revolutionise breast cancer screening.

Diagnostic Accuracy of CEM vs Conventional Imaging

The RACER trial found that CEM and conventional imaging methods like FFDM and DBT displayed comparable diagnostic accuracy in terms of sensitivity and specificity. Sensitivity measures the ability to correctly identify positive cases, while specificity refers to correctly identifying negative cases. In the RACER trial, the sensitivity of CEM was 98.0%, compared to 97.7% for conventional imaging. The specificity was similarly close, with 75.6% for CEM and 75.4% for conventional imaging.

This indicates that both methods are highly effective in detecting breast cancer. However, CEM demonstrates its superiority in its ability to detect occult or hidden lesions. The trial found that 13 additional malignant lesions were detected using CEM, while only three were found using conventional methods. This advantage in detecting hidden malignancies underlines CEM's potential as a more comprehensive diagnostic tool, particularly for women with dense breast tissue, where standard mammography can sometimes fail to detect abnormalities.

Efficiency in Diagnostic Work-Up

One of the most significant findings from the RACER trial is that CEM reduces the need for additional imaging and tissue sampling, thus streamlining the diagnostic process. After the primary imaging, a final diagnosis was reached in 27.7% of cases using CEM, compared to only 1.1% with conventional imaging. This is a crucial benefit, as fewer follow-up tests not only reduce the burden on healthcare resources but also lessen the psychological stress on patients.

The trial also highlighted that the need for supplemental examinations, such as ultrasounds or MRIs, was significantly lower in the CEM group. Ultrasound, which is often used to differentiate between cystic and solid masses, was required less frequently in patients who underwent CEM, thanks to the high sensitivity of this imaging method. Tissue sampling, including core needle biopsies, was also less common in the CEM group. Additionally, the number of rounds of supplemental imaging was significantly higher in the conventional imaging arm. Women in the conventional imaging group often needed three or more rounds of supplemental imaging compared to those in the CEM group, underscoring CEM’s efficiency in diagnostic work-up.

Time to Diagnosis and Patient Outcomes

Another critical advantage of CEM over conventional imaging was its time to reach a final diagnosis. Although both arms of the trial had a median diagnostic time of just one day, CEM provided a final diagnosis on the same day of enrolment in 40.5% of cases, compared to 37.8% in the conventional group. While the difference may seem marginal, the streamlined process with CEM reduces the number of follow-up appointments, thus offering a quicker resolution for patients.

Quick diagnoses are critical in alleviating the anxiety that many women experience when recalled for additional testing after an initial screening. Studies have shown that anxiety after a false-positive recall can last for up to a year, affecting the patient’s quality of life. By reducing the need for further testing and providing faster answers, CEM helps to mitigate this anxiety.

The trial also revealed that CEM could detect more advanced occult cancers earlier, allowing for timelier and potentially more effective treatment interventions. Several occult lesions detected in the CEM group led to changes in patient treatment plans, which could have a profound impact on long-term outcomes. This capability makes CEM not only a diagnostic tool but also a potential lifesaver by catching cancers that other methods may have missed.

Conclusion

The RACER trial offers compelling evidence for using CEM as a primary imaging tool in breast cancer screening recalls. While both CEM and conventional imaging methods show comparable diagnostic accuracy, CEM demonstrates clear advantages in efficiency, particularly in reducing the need for supplemental imaging and tissue sampling. Moreover, CEM's ability to detect additional, often hidden, malignant lesions offers a significant benefit for patient outcomes.

Given the high diagnostic performance and increased efficiency of CEM, it is poised to become a preferred imaging modality in the diagnostic work-up for women recalled from breast cancer screening. As the technology becomes more widely adopted, healthcare systems could see reduced costs associated with follow-up tests, and patients could experience lower anxiety levels and faster diagnoses. Future studies, including cost-effectiveness analyses, will further elucidate CEM's role in breast cancer diagnosis. Still, the results of the RACER trial mark a significant step forward in improving breast cancer detection and care.

Source: **The Lancet Regional Health Europe**

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