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Palmar Angle of Tri-Radius for Breast Cancer Screening in Women

Plain Language Summary

Breast cancer is the most common cancer among women in India. Screening of women above 35 years of age helps in early diagnosis thus decreasing deaths. Current guidelines recommend clinical breast examination (CBE) for all women over 30 years of age, followed by an ultrasound scan (USG) in suspected cases. These procedures are carried out by staff nurses or Auxiliary Nurse Midwives (ANM). Diagnosis is then confirmed through a biopsy or cytology.

In Madhya Pradesh, the uptake of CBE has been a challenge for several reasons. The AIGGPA, an autonomous public policy think tank of Madhya Pradesh Government is considering the use of palmar angle of tri-radius (ATD)-angle measurement (a non-invasive screening method) as an alternative option for breast cancer screening.

A comprehensive search was conducted in multiple databases but no evidence was identified which supported the use of ATD-angle measurement for breast cancer screening in women. Research done so far on ATD-angle for breast cancer did not use appropriate and rigorous study design to measure its diagnostic accuracy. Further, the sensitivity and specificity parameters of the test were not measured, which are required to understand if they can be used instead of CBE (alone or in conjunction with USG/mammography) for population based screening. It is recommended that a future pilot study using a rigorous and an appropriate study design be conducted to understand the sensitivity, specificity and costs of ATD-angle measurement in relation to existing community screening modalities for breast cancer.

What is a rapid policy brief?

A rapid policy brief is based on a rapid review which brings together global **research evidence in a specific decision-making context**. The rapid review which forms the basis of this brief is available as a technical supplement at www.georgeinstitute.org.in

Why this rapid policy brief was prepared?

This was prepared on request from the **Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis (AIGGPA)**, Madhya Pradesh, India.

Palmar angle of tri-radius measurement for breast cancer screening in women

Background

Breast cancer is the most commonly reported cancer among women in India, with an incidence rate of 25.8 per 100,000, as reported in 2012.[1] Effective primary screening for breast cancer among women is a key strategy of India's National Programme for the Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS).[2] The current guidelines recommend the use of CBE, followed by USG in CBE positive cases. Mammography is recommended in women above 35 years of age, in addition to ultrasound, if it is available. In suspected cases of malignancy, core biopsy or fine needle cytology is recommended to confirm diagnosis.[2]

The Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis (AIGGPA), is considering the use of palmar angle of tri-radius (ATD) measurement, a modality of dermatoglyphics as a potential tool to screen women at-risk for breast cancer. This RES was developed on request from the AIGGPA.

The purpose of this RES was to aid and inform policy decision-making on the use of ATD-angle measurement as a useful alternative to existing standard breast cancer screening methods. This policy brief included diagnostic accuracy studies that examined ATD-angle measurement. The aim of this policy brief was to examine the ability of palmar ATD-angle measurement to clearly identify women with breast cancer (sensitivity), as well as to correctly identify women without breast cancer (specificity).

Summary of the evidence

Nine electronic databases were searched and 108 studies were identified. Based on the pre-specified inclusion criteria, 44 studies (a majority of them published after year 2000) were considered potentially eligible for inclusion in the report. However, on full-text examination, none of the studies were considered relevant and/or eligible for inclusion. A majority of the excluded studies used inappropriate study design (case-control) and/or did not compare ATD-angle measurement with a standard screening method to examine diagnostic test accuracy (sensitivity and/or specificity).

Summary of the excluded studies

All excluded studies used a study design which could not answer the central question on the diagnostic accuracy of palmar ATD for breast cancer screening. A majority of the studies were conducted in India (n=12), a couple from Eastern Europe, and one

each from Italy and Nigeria. The studies compared the use of palmar ATD-angle measurement in women with breast cancer (biopsy confirmed cases) with healthy controls, i.e. women without breast cancer. The palmar impressions were taken to determine the ATD-angle, and were generally measured using a protractor. A wider ATD-angle or an increase in the angle, was clearly reported in seven out of 16 studies for women with breast cancer. However, overall, there was a lack of consistent reporting of the ATD-angle findings. Other quantitative parameters of dermatoglyphics were also measured in these studies.

Policy options

- Research done so far on ATD-angle measurement for breast cancer did not use appropriate and rigorous study designs. Further, the studies did not measure the required parameters (sensitivity and specificity) to understand if ATD-angle measurement could be used instead of CBE (alone or in conjunction with USG/mammography) for community screening.
- Decision-makers may consider prioritising funding for a pilot study to assess the diagnostic accuracy of ATD-angle measurement for breast cancer screening in women using an appropriate study design.

Recommendations for future research

- Future studies in this area should use a cross-sectional study design, and evaluate the sensitivity and specificity of palmar ATD-angle against a reference standard test (CBE alone or in conjunction with USG/ mammography) in the same cohort of women (i.e. all women >30 years who undergo both the ATD-angle measurement and the reference standard test, along with confirmation by gold standard test).
- Case–control study designs are generally not representative of a test's accuracy in clinical practice, in that they overestimate the accuracy of the test. Cross-sectional study designs are generally the preferred study designs to provide valid estimates of diagnostic accuracy.
- A greater commitment for collaboration between policy makers, researchers and oncogeneticists will likely improve the evidence base to help formulate robust policy recommendations.

References

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Competing interests

The authors do not have any relevant competing interests.

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