A reader study of MARIA radiowave breast imaging compared with x-ray mammography for the symptomatic breast

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PURPOSE

MARIA is a new, non-ionising, non-compressing radiowave breast imaging modality with good dense breast performance which has early potential as an adjunct to x-ray mammography (MMG). This study presents a sensitivity comparison of MARIA and MMG using offline reads of the respective images.

METHOD AND MATERIALS

Females attending a symptomatic breast clinic at one of 3 UK symptomatic clinics (Southmead - Bristol, Thirlestaine - Cheltenham, Great Western - Swindon), were identified by clinicians as having a palpable lump. Following informed consent, eligible patients meeting inclusion criteria were scanned in the prone position with MARIA, a non-ionising, multi-static radar system (Yorkshire & The Humber and South Yorkshire REC 15/YH/0084) ClinicalTrials.gov NCT02493595. Patients had ultrasound scan (US) and/or mammography (MMG). Cytology/ histology was conducted as necessary as part of normal clinical procedure and final diagnosis was determined. Both MARIA and MMG were read offline by independent readers who had no knowledge of the clinical outcome. Features identified in either modality were subsequently compared to the diagnosis on discharge (including histology/ cytology where available) to determine a sensitivity score.

RESULTS

145 single breast studies were analysed. MMG sensitivity, defined as successful detection of the symptomatic index lesion, was 79% (42/52) in lucent (BI-RAD a,b) while MARIA sensitivity in lucent was 71% (37/42). For dense breasts (BI-RAD c, d), sensitivity for MMG was 54% (50/92) while for MARIA it was 77% (71/92).

CONCLUSION

Initial results suggest that the MARIA system offers the provision of a safer (non-ionising), more comfortable (no breast compression) and inexpensive breast screening alternative compared to other modalities, which has been shown to be effective at detecting cancers in younger, pre-menopausal women with dense breasts. MARIA may also overcome some of the challenges posed by trying to optimise the balance between benefit and harm of MMG screening in women of younger age.

CLINICAL RELEVANCE/APPLICATION

The sensitivity of MMG is low for women with dense breasts (DB). MARIA shows great promise as a whole-breast adjunct offering a benign, more comfortable, sensitive diagnostic for women with DB.

FIGURE (OPTIONAL)

Uploaded Image

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Nothing to disclose:	Iain Lyburn

Nothing to disclose:	Lucinda Hobson
Nothing to disclose:	Helen Massey
Clinical research coordinator of medical device manufacturer (Micrima Ltd)	Monika Schoenleber-Lewis
Nothing to disclose:	Mike Shere

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