



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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# **Abbreviated Breast MRI Protocols in the Screening of High-Risk Females**

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*Submitted for Partial Fulfillment of Master Degree in  
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قالوا

لسبحانك لا علم لنا  
إلا ما علمتنا إنك أنت  
العليم العظيم

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# List of Abbreviations

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Abb.	Full term
3D .....	Three-dimensional
AB .....	Abbreviated
ADC .....	Apparent diffusion coefficient
BI-RADS .....	Breast Imaging Reporting and Data System
DSC .....	Dynamic susceptibility contrast
DWI .....	Diffusion-Weighted Imaging
FSPGR .....	Fast spoiled gradient echo sequence
MIP .....	Maximum intensity projection
MRI .....	Magnetic resonance imaging
MRS .....	Magnetic resonance spectroscopy
SD .....	Standard deviation
SPSS .....	Statistical package for social sciences
SWI .....	Susceptibility-weighted imaging
TDLU .....	Terminal duct lobular unit

## INTRODUCTION

Numerous studies in the 2000's have recognized contrast-enhanced MRI breast as a tool for screening females who are considered to be high-risk, from a specific hereditary condition and/or familial history of cancers that increases the chances of developing breast cancer (*Mann et al., 2019*).

In the latest studies on women who have several risk profiles, the screening sensitivity of the breast MRI ranged between 81 to 100%, which is almost double that of the sensitivity of screening mammography. The specificity was also found to increase in follow-up studies to approximately 97%, with positive predictive values for biopsy similar in range for that of mammography.

MRI also specializes in detecting breast cancers that lean more to the aggressive and invasive types, and was proved to have higher sensitivity for cancers compared to mammography. This achievement suggests that women screened with MRI breast, can regard the rest of the screening tools as supplemental (*Newell et al., 2018*).

Studies also suggest that mammography may detect 5% of additional cancers, mostly ductal carcinoma in situ, whilst decreasing the specificity and ultimately increasing the cost. And once MRI is used, ultrasound has almost no additional value. All evidence points that in other females who participated in various studies, the MRI performance is in fact superior to more orthodox

screening methods. Especially in females who reported a personal history of breast cancer, particularly those who presented with a biopsy-proven result of lobular carcinoma in situ (*Mann et al., 2019*).

Various studies proved that breast MRI detects cancer at early stages, inducing a stage-shift increase in the survival advantage of breast cancer screening. In the meantime, the cost of the study using MRI itself is a driving factor, therefore there are efforts to decrease the costs and to turn it into a more accessible tool. Thus, the utilization of abbreviated MRI protocols will likely allow much more extensive use of MRI breast as a routine modality for screening (*Leithner et al., 2018*).

## AIM OF THE WORK

This study aims to decrease scanning time with the abbreviated MRI protocol and to achieve the same high level of cancer detection while providing greater efficiency, improved patient tolerance of the examination, and substantial resource savings.