

# TROP2 LEVEL IMPORTANCE AS PROGNOSTIC VALUE IN BREAST CANCER PATIENTS

Dr. Hazim A. A. Altae <sup>1</sup>, Dr. Sadik A. Abdullah <sup>2</sup>

<sup>1</sup>Medical Technical college, Al-Farahidi University, Iraq.

<sup>2</sup>Medical Technical college, Al-Shaab University, Iraq.

Contact:alimsaleam@gmail.com

DOI: 10.47750/pnr.2023.14.02.93

## Abstract

**Background:** Breast cancer (BC) is disease effected the breast tissue , it's onset at female more than male . The diagnosis of BC depend on oncology guideline included clinical , radiological and laboratory examination . Trophoblast cell surface antigen 2 (TROP2) is glycoprotein molecular act as trans-membrane receptor encoded and synthesized via tumor associated Ca signal transducer 2 (Tacstd2) gene that located on chromosome 1p32 .

**Objective of the Study:** At this study explain high TROP2 marker expression in malignant BC patients via used Immunohistochemical method , and use it as prognostic value for BC disease .

**Materials and Methods:** This study is done at Al-Yarmook Teaching Hospital from ..... 2020 to .....2022 , included 60 individuals classified into malignant and non-malignant of BC .All individuals applied under examinations then detected presence of TROP2 marker via Immunohistochemical method .

**Results:** Present study appeared high different value for TROP2 marker expression between malignant and non-malignant BC groups . TROP2 expression was high percent in malignant BC group compared with non-malignant group.

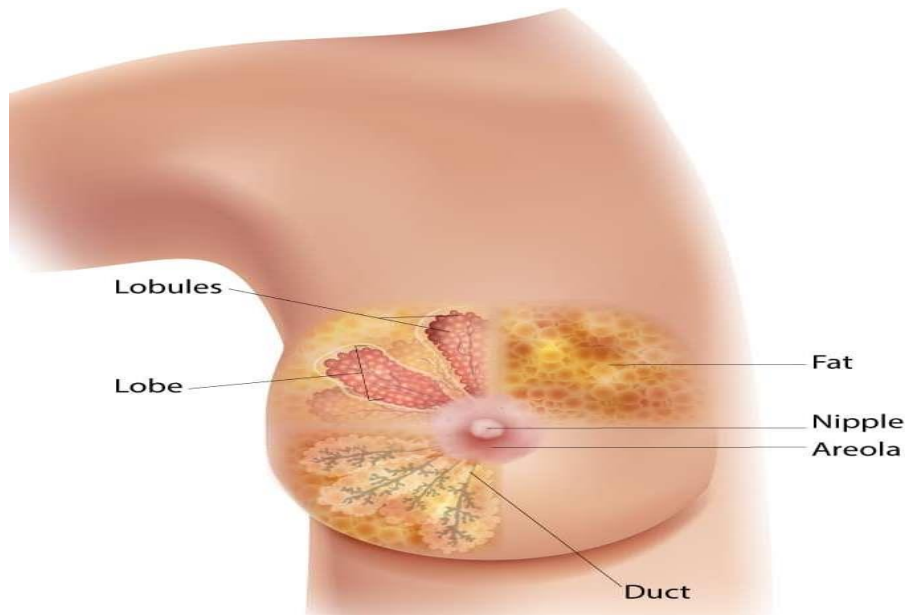
**Conclusion:** The present study confirmed role of TROP2 marker expression at BC progression and used it as prognostic value to BC disease .

**Keywords:** Breast cancer (BC), TROP2 and prognostic value .

## Introduction

Breast cancer (BC ) is disease characterized by an unregularly breast cells proliferation in both genders but it commonly in females , it has different types according to cells that turn to cancer and which breast part that effected <sup>(1)</sup> . BC mostly begin from lobules or ducts in breast tissues , and spread to other body tissue via blood and lymph circulations . So , there are two commonly types of BC Invasive ductal carcinoma and Invasive lobular carcinoma <sup>(2)</sup> . See figure 1 .

Figure 1 : Breast anatomy



The main pathological cause of BC unclear yet , but the recent studies determined various risk factors for examples :above 55 years of age ,gender (females more effected than males ) ,family history (genetic), smoking ,obesity and others . The symptoms and signs coupled with BC are size and shape changes of breast , mass appear in breast , change of breast feel or look , redness of nipple and others <sup>(3)</sup> . On other hand , BC diagnosis according to many guidelines but commonly depending on various examinations like clinical examinations , radiological examinations (such as Mammogram , Magnetic resonance imaging (MRI) and others ) and laboratory examinations ( such as genetic analysis and tumor markers ) <sup>(4)</sup> .

Trophoblast cell surface antigen 2 (TROP2) is glycoprotein molecular act as trans-membrane receptor encoded and synthesized via tumor associated Ca signal transducer 2 (Tacstd2) gene that located on chromosome 1p32 . TROP2 overexpression increase in various tumors like ovarian , pancreatic , breast and thyroid cancers because the TROP2 present on cell surface and develop in epithelial malignancies <sup>(5)</sup> .

Current study aim to explain the TROP2 overexpression in BC patients by measurement it's level in BC and healthy groups , that it can use as prognostic value to detect present BC <sup>(6)</sup> .

## Material and method

This study designed according to selection of 60 individuals have breast mass, all study individuals were females and their age above 40 years .

The European Society for Medical Oncology (ESMO) (2022) Guidelines criteria that include radiological ,laboratory and clinical examinations were apply on the all study individuals to diagnose presence the breast mass without other mass in other tissue <sup>(7)</sup> . After this , the all individuals forwarded for biopsies process to determined malignant or not mass after take biopsy sample from breast mass . Biopsy samples were collected with paraffin to preserved it then send it to laboratory .In laboratory ,the all individuals biopsy examined and find 33 individuals with malignant BC and 27 non-malignant BC , then samples treated with Immunohistochemical method to determined TROP2 expression by used the qualitative measurement . This study done at Al-Yarmook Teaching Hospital started at.....2022 and end at ..... 2022 .

Statistic analyses : At this study used the chi-square method to determine the different value between malignant breast mass group and non-malignant breast mass group via p-value ( $> 0.05$  = significant value) .

## Results

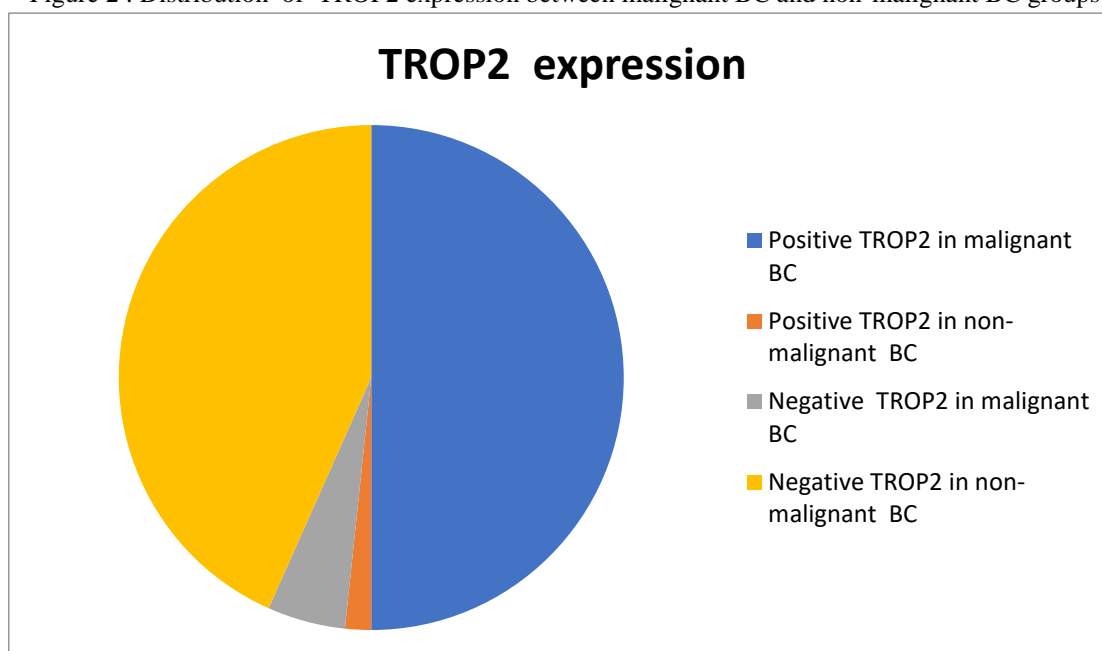
This study show a different value of TROP2 marker between malignant BC and non-malignant BC groups. Different value was the 91% positive TROP2 of malignant BC group with 96% negative TROP2 of non-malignant BC group . To explain different result between groups, used the Chi-square method with p-value . See table 1 and figure 2 .

Table 1: Comparison study between malignant BC and non-malignant BC groups depend on TROP2 marker by Chi-square statistic method

Parameters	malignant BC group (33 cases)	non-malignant BC group (27 cases)	P-value
TROP2 expression	30 Positive	1 Positive	0.001*
	3 Negative	26 Negative	

\*Significant value

Figure 2 : Distribution of TROP2 expression between malignant BC and non-malignant BC groups



## Discussion

In the current study , the immunohistochemical method used to determined the TROP2 marker expression in malignant BC patients compares with non-malignant persons . This study show high significant value for TROP2 marker expression with malignant BC compared with non-malignant persons , that is agree with other research like Liu X, Deng J and et al 2022 that are appear elevation of TROP2 expression percent in malignant BC group <sup>(8)</sup> .

TROP2's marker expression has high specificity and sensitivity for BC because at this results appear the high percent of positive result of TROP2 at malignant BC group <sup>(6)</sup> . So , the TROP2 immunohistochemistry staining method consider as strong diagnostic and prognostic marker for malignant BC . The presence of TROP2 expression in tumor tissue of breast because activating of MAPK / ERK pathway that act on genetic level to

support tumor forming . This mechanism act to promote various pathway of cells that results migration , proliferation and invasion leading to tumor mass progression in breast tissue <sup>(9)</sup> .

The result of this study agree with Shastry M, Jacob S, and et al 2022 that also demonstrated the role of TROP2 and high expression it in BC ,that can use it as prognostic marker to malignant BC <sup>(10)</sup> .

## Conclusion

This study result demonstrate the TROP2 effect on BC , that act as prognostic marker to malignant BC because has role in the migration ,proliferation and other roles of cell .

## References:

- 1- Gradishar WJ, Moran MS, Abraham J, Aft R, Agnese D, Allison KH, Anderson B, Burstein HJ, Chew H, Dang C, Elias AD. Breast cancer, version 3.2022, NCCN clinical practice guidelines in oncology. *Journal of the National Comprehensive Cancer Network*. 2022 Jun 1;20(6):691-722.
- 2- Mouabbi JA, Hassan A, Lim B, Hortobagyi GN, Tripathy D, Layman RM. Invasive lobular carcinoma: an understudied emergent subtype of breast cancer. *Breast Cancer Research and Treatment*. 2022 Mar 26:1-2.
- 3- Díaz C, González-Olmedo C, Díaz-Beltrán L, Camacho J, Mena García P, Martín-Blázquez A, Fernández-Navarro M, Ortega-Granados AL, Gálvez-Montosa F, Marchal JA, Vicente F. Predicting dynamic response to neoadjuvant chemotherapy in breast cancer: a novel metabolomics approach. *Molecular Oncology*. 2022 Mar 26.
- 4- Bhushan A, Gonsalves A, Menon JU. Current state of breast cancer diagnosis, treatment, and theranostics. *Pharmaceutics*. 2021 May 14;13(5):723 .
- 5- Hoppe S, Meder L, Gebauer F, Ullrich RT, Zander T, Hillmer AM, Buettner R, Plum P, Puppe J, Malter W, Quaas A. Trophoblast Cell Surface Antigen 2 (TROP2) as a Predictive Bio-Marker for the Therapeutic Efficacy of Sacituzumab Govitecan in Adenocarcinoma of the Esophagus. *Cancers*. 2022 Sep 30;14(19):4789 .
- 6- Vidula N, Yau C, Rugo H. Trophoblast Cell Surface Antigen 2 gene (TACSTD2) expression in primary breast cancer. *Breast Cancer Research and Treatment*. 2022 Aug;194(3):569-75.
- 7- Wolf I, Waissengrin B, Zer A, Bernstein-Molho R, Rouvinov K, Cohen JE, Cherny NI, Bar-Sela G. Implementation of the ESMO-Magnitude of Clinical Benefit Scale: real world example from the 2022 Israeli National Reimbursement Process. *ESMO open*. 2022 Feb 1;7(1).
- 8- Liu X, Deng J, Yuan Y, Chen W, Sun W, Wang Y, Huang H, Liang B, Ming T, Wen J, Huang B. Advances in Trop2-targeted therapy: novel agents and opportunities beyond breast cancer. *Pharmacology & Therapeutics*. 2022 Oct 5:108296.
- 9- Wolber P, Nachtsheim L, Hoffmann F, Klußmann JP, Meyer M, von Eggeling F, Guntinas-Lichius O, Quaas A, Arolt C. Trophoblast cell surface antigen 2 (Trop-2) protein is highly expressed in salivary gland carcinomas and represents a potential therapeutic target. *Head and neck pathology*. 2021 Dec;15(4):1147-55.
- 10- Shastry M, Jacob S, Rugo HS, Hamilton E. Antibody-drug conjugates targeting TROP-2: Clinical development in metastatic breast cancer. *The Breast*. 2022 Dec 1;66:169-77.