

ABSTRACT

Background: Triple Negative Breast Cancer (TNBC) is one of the biggest threats for women. TNBC has relatively poor prognosis and the risk appears higher in people with deletion in the Glutathione S-Transferase Mu 1 (GSTM1) gene. Chronic inflammation increases the risk of developing TNBC. Inflammation triggers the nuclear factor kappa-light-chain-enhancer of activated B cells (NF- κ B) signaling pathway. It plays a role in the progression of TNBC to more malignant and resistant direction. Thus, the influence of GSTM1 on the role of NF- κ B in the development of TNBC with its association with inflammation needs to be studied.

Objective: The study aims to determine the effect of GSTM1 gene on NF- κ B mRNA expression in 4T1 cells.

Method: The research uses an experimental design using descriptive studies. Data uses in-vitro samples which are divided into two groups, GSTM1 wild-type and GSTM1 knockout. PCR results were processed using electrophoresis, visualized with Gel Doc and processed with ImageJ.

Result: Analysis of the visualization results from electrophoresis showed that NF- κ B expression in both GSTM1 knockout and GSTM1 wild-type sample groups did not appear in the two data collections.

Conclusion: The effect of GSTM1 gene on NF- κ B mRNA expression in 4T1 cells cannot yet be determined because NF- κ B mRNA expression in the GSTM1 knockout and GSTM1 wild-type sample groups did not appear.

Keyword(s): *Triple Negative Breast Cancer, nuclear factor kappa-light-chain-enhancer of activated B cells, Glutathione S-Transferase Mu 1, 4T1 cell*

ABSTRAK

Latar Belakang: *Triple Negative Breast Cancer* (TNBC) adalah salah satu ancaman terbesar bagi wanita pada saat ini. TNBC memiliki prognosis relatif buruk dan risiko muncul lebih tinggi pada orang yang mengalami delesi pada gen Glutathione S-Transferase Mu 1 (GSTM1). Inflamasi kronis berkontribusi meningkatkan resiko berkembangnya TNBC. Inflamasi memicu jalur persinyalan *nuclear factor kappa-light-chain-enhancer of activated B cells* (NF- κ B). Jalur persinyalan NF- κ B berperan dalam progresivitas TNBC ke arah yang lebih malignan dan resisten. Dengan demikian, pengaruh keberadaan GSTM1 terhadap peran NF- κ B dalam perkembangan TNBC dengan asosiasinya terhadap inflamasi perlu dikaji.

Tujuan: Penelitian bertujuan untuk mengetahui pengaruh gen GSTM1 terhadap ekspresi mRNA NF- κ B pada sel 4T1

Metode: Penelitian menggunakan desain eksperimental dengan menggunakan studi deskriptif. Data menggunakan sampel *in-vitro* yang dibedakan menjadi dua kelompok yaitu GSTM1 *wild-type* dan GSTM1 *knockout*. Hasil PCR diproses menggunakan elektroforesis, divisualisasikan dengan Gel Doc dan diolah dengan ImageJ.

Hasil: Analisis terhadap hasil visualisasi dari elektroforesis menunjukkan ekspresi NF- κ B pada kedua kelompok sampel GSTM1 *knockout* dan GSTM1 *wild-type* tidak muncul pada dua kali pengambilan data.

Kesimpulan: Pengaruh dari keberadaan gen GSTM1 terhadap ekspresi mRNA NF- κ B pada sel 4T1 belum dapat diketahui karena ekspresi mRNA NF- κ B pada kelompok sampel GSTM1 *knockout* maupun GSTM1 *wild-type* tidak muncul.

Kata kunci: *Triple Negative Breast Cancer, nuclear factor kappa-light-chain-enhancer of activated B cells, Glutathione S-Transferase Mu 1, sel 4T1*