Glutathione S-transferase polymorphisms influence chemotherapy response and treatment outcome in breast cancer

J. Wang¹, T. Wang², G.-Y. Yin², L. Yang³, Z.-G. Wang⁴ and X.-B. Bu⁵

¹Department of Biology, School of Basic Medicine, Mudanjiang Medical University, Mudanjiang, China
²Department of Ultrasonography, Hongqi Hospital of Mudanjiang Medical University, Mudanjiang, China
³General Administration of Civil Aviation of China Northeast Regional Administration Medical Center, Shenyang, China
⁴Endoscopy Center, The Second Hospital of DaLian Medical University, DaLian, China
⁵Department of Biology, School of Basic Medicine, Mudanjiang Medical University, Mudanjiang, China

Corresponding author: X.-B. Bu
E-mail: xiaobobu66@126.com

Received January 25, 2015
Accepted May 26, 2015
Published September 22, 2015
DOI http://dx.doi.org/10.4238/2015.September.22.6

ABSTRACT. The aim of this study was to evaluate the role of GSTM1 null/present, GSTT1 null/present, and GSTP1 Ile105Val polymorphisms in the clinical response to chemotherapy and treatment outcome of patients with breast cancer. A total of 262 subjects were randomly selected from among patients with a histologically confirmed breast cancer. The genotypes of GSTM1, GSTT1, and GSTP1 Ile105Val polymorphisms were determined by polymerase chain reaction-restriction fragment length polymorphism analysis. Our study found that the null genotype of GSTM1 was associated with a better response to chemotherapy, and the odds ratio [95% confidence interval (CI)] was 1.78
In the Cox proportional hazard model, the hazard ratio (95%CI) for overall survival (OS) in patients carrying the null genotype of \textit{GSTM1} was 0.57 (0.32-0.98) using the non-null genotype as the reference variable. However, we observed no significant association between the \textit{GSTT1} and \textit{GSTP1} polymorphisms and response to chemotherapy and OS in patients with breast cancer. In conclusion, our study found that the \textit{GSTM1} polymorphism plays an important role in influencing the chemotherapy response and OS in patients with breast cancer.

\textbf{Key words:} Glutathione S-transferases; Polymorphism; Chemotherapy; Clinical outcome