

Gene deletions of glutathione S-transferase and iron status in sickle cell patients

Paula Juliana Antoniazco Zamaro

Laboratory of Hemoglobin and Genetics of Hematological Diseases, Biology Department, Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP São José do Rio Preto, SP, Brazil

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Corresponding author:

Paula Juliana Antoniazco Zamaro
Biology Department, Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP
Rua Cristóvão Colombo, 2265 – Jd. Nazareth
15041-000 – São José do Rio Preto
SP, Brazil
paulazamaro@yahoo.com.br

www.rbhh.org or www.scielo.br/rbhh

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Glutathione S-transferases (GSTs) constitute multifunctional enzymes that are coded by at least eight distinct loci: α (GSTA); μ (GSTM); θ (GSTT); π (GSTP); σ (GSTS); κ (GSTK); ω (GSTO); and ζ (GSTZ), each one composed of one or more homodimeric or heterodimeric isoforms. These enzymes are involved in the conjugation reactions between glutathione (GSH) and a variety of potentially toxic and carcinogenic electrophilic compounds. Additionally, GSTs display peroxidase activity and this can protect against oxidative damage. Deficiency in the activity of this enzyme may be due to inherited GST polymorphisms, e.g., GSTT1 (22q11.23); GSTM1 (1q13.3) and GSTP1 (11q13).^(1,2)

Hemoglobin S (Hb S) that results from a substitution of valine for glutamic acid at position 6 of the β -globin chain was the first hemoglobin variant to be discovered. This group of disorders, characterized by the polymerization of deoxygenated Hb S into rigid rod-like polymers, causes the sickling of red blood cells. The clinical severity and hematological manifestations of sickle cell anemia are varied and are influenced by the participation of several genes in modulating the phenotype of sickle cell disease; polymorphisms of these genes may be related to the different manifestations between individuals.^(3,4) Some studies involving different polymorphisms of GST have been performed in patients with sickle cell disease. Silva et al.⁽⁵⁾ found an association between GSTP1 polymorphisms and increased GSH in Brazilian sickle cell patients.

In this issue of the *Revista Brasileira de Hematologia e Hemoterapia* there is an important assessment of GST in sickle cell disease patients which estimates the frequency of polymorphisms and correlates the different genotypes with the iron status of patients.⁽⁶⁾ GST polymorphisms were evaluated in 100 patients with sickle cell disease in India and no correlation was found in relation to iron status, unlike beta thalassemia patients as reported

in the literature. Thus further studies on this theme addressing some other parameters related to iron levels other than ferritin should be evaluated to better understand the relationship between GSTs and iron status in sickle cell disease.

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