MTHFR C677T and A1298C polymorphisms as predictors of radiotherapy response in head and neck squamous cell carcinoma

Q.S. Anders¹, E. Stur¹, L.P. Agostini¹, F.M. Garcia¹, R.S. Reis¹, J.A. Santos¹, S.O. Mendes¹, L.L. Maia⁵, G.T. Peterle⁵, V. Stange¹, M.B. Carvalho², E.H. Tajara¹, M. Santos⁴, A.M.A. Silva-Conforti¹⁵ and I.D. Louro¹

¹Núcleo de Genética Humana e Molecular, Departamento de Biologia, Universidade Federal do Espírito Santo, Espírito Santo, ES, Brasil
²Laboratório de Biologia Molecular, Hospital Heliópolis, São Paulo, SP, Brasil
³Departamento de Biologia Molecular, Faculdade de Medicina, São José do Rio Preto, SP, Brasil
⁴Departamento de Medicina, Universidade Federal do Rio Grande do Norte, Campus Caicó, Caicó, RN, Brasil
⁵Departamento de Biologia, Universidade Federal do Espírito Santo, Alegre, ES, Brasil

Corresponding author: I.D. Louro
E-mail: iurilouro@yahoo.com

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ABSTRACT. The C677T and A1298C polymorphisms in methylene-tetrahydrofolate reductase (MTHFR), which regulates the release of active folate in the body, may have reduced activity. Given that folate participates in important intracellular pathways, such as nucleotide synthesis and biomolecule methylation, it seems plausible that patients with head and neck squamous cell carcinoma (HNSCC) may respond differently to radiotherapy treatments, based on genetic polymor-
phisms. Therefore, this study sought to understand the role of these polymorphisms in HNSCC patient radiotherapy response. Genotypes were detected by PCR-RFLP after extraction of DNA from peripheral blood lymphocytes. Survival curves were analyzed by the Kaplan-Meier model, and significant differences were analyzed by the Wilcoxon test. Response to radiotherapy in patients with laryngeal SCC was significantly associated with the MTHFR C677T polymorphism (P = 0.030). Indeed, the presence of at least one T allele decreases the mortality rate up to 3-fold. Therefore, we propose that MTHFR C677T may represent a putative biomarker for radiotherapy prognosis in laryngeal SCC patients.

**Key words:** MTHFR; Head and neck cancer; Radiotherapy