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HOTAIR as a Prognostic Predictor for Multiple Human Malignant Diseases: A Systematic Review and Meta-Analysis

Halil İbrahim Toy, Didem Ökmen, Athanasia Pavlopoulou

Department of Molecular Biology and Biomedicine, Dokuz Eylül University School of Medicine, İzmir, Turkey

Objectives: The long non-coding RNA HOX transcript antisense intergenic RNA (HOTAIR), which is transcribed from the HOXC locus, interacts with the Polycomb Repressive Complex 2 (PRC2) to epigenetically regulate different loci, such as HOXD. HOTAIR can act as an oncogene by recruiting the PRC2 complex to tumor suppressor genes and downregulating their expression in different types of cancers. Of note, HOTAIR has been shown to contribute largely to cell migration, invasion, metastasis and apoptosis in various cancers. Several studies suggest that increased expression of HOTAIR is a poor prognostic indicator in several cancers. However, there is an apparent inconsistency in the results of these studies. We conducted a meta-analysis to further investigate the prognostic value of HOTAIR expression in various types of cancers.

Methods: Systematic review of the published scientific studies was conducted by following the PRISMA guidelines. The biomedical literature was manually searched for published scientific studies on the associations between HOTAIR expression and prognosis in different types of cancers by using relevant keywords. Relevant data were extracted from the included studies. All statistical analyses were performed with STATA statistical software and Microsoft Excel.

Results: The 52 eligible studies including a total of 4873 patients were enrolled in the current meta-analysis. There is a statistically significant relationship between elevated HOTAIR expression and poor overall survival (OS) (HR=2.00; 95%CI: 1.70-2.36; p=0.000), and worse progression-free survival (PFS)/metastasis-free survival (MFS) (HR=2.40; 95%CI: 1.55-3.72; p=0.000), and recurrence-free survival (RFS)/disease-free survival (DFS) (HR=1.49; 95%CI=1.05-2.12; p=0.027), respectively.

Conclusion: This is the first meta-analysis to include a sufficiently large number of studies needed to carry out a comprehensive analysis. The analysis of OS and DFS/RFS and PFS/DFS suggests that elevated HOTAIR expression is predictive of poor prognosis in cancers.

Keywords: HOTAIR, prognosis, meta-analysis, cancer