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DLX6: A Novel Immune-Related Prognostic Biomarker for Nasopharyngeal Carcinoma

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Abstract
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Abstract

Objectives:

Recurrence and metastasis of cancer are known to account for the poor prognosis of nasopharyngeal carcinoma (NPC). Currently, immunotherapy is being extensively studied in recurrent or metastatic NPC. The tumor microenvironment (TME) is known to contribute to tumor progression and immune escape. This study aimed to identify a prognostic and immunotherapeutic biomarker related to TME. We focused on distal-less homeobox 6 (DLX6).

Methods:

Gene Expression Omnibus was used to analyze the differential expression of DLX6 for its prognostic value, biological functions. Kaplan–Meier plots and Cox regression analysis were used to determine the impact of DLX6 on clinical prognosis. The biological functions of DLX6 were evaluated using the gene set enrichment analysis (GSEA). The relationship between DLX6 and immune cell infiltration was explored by single sample GSEA.

Results:

We found that high expression of DLX6 was related to worse progression-free survival. The GSEA exhibited that low DLX6 expression was correlated with immune-related pathways. Through the ESTIMATE algorithm, it was found that not only was DLX6 expression negatively associated with ImmuneScore and StromalScore but also negatively associated with tumor-infiltrating immune cell levels. Furthermore, the Tumor Immune Dysfunction and Exclusion framework demonstrated that the patients with high DLX6 expression exhibited lower immunotherapy efficacy than those with low DLX6 expression. Subsequently, we performed immunohistochemistry for DLX6 and markers of infiltrating immune cells to validate our findings in public data.

Conclusion(s):

Collectively, our results indicate that DLX6 is a promising candidate biomarker for predicting prognosis and immune landscape in NPC.