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ORIGINAL ARTICLE

**Expression of mitochondrial dynamics markers during melanoma progression: Comparative study of head and neck cutaneous and mucosal melanomas**

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Abstract

Background

Head and neck mucosal melanomas (MMs) are rare tumors with adverse outcomes and poorer prognoses than their more common cutaneous counterparts (cutaneous melanomas—CMs). Few studies have compared the expression of mitochondrial dynamic markers in these tumors. This study aimed to assess the correlations of mitochondrial markers with melanoma progression and their potential as predictors of lymph node involvement and distant metastasis.

Methods

Immunohistochemistry against anti‐mitochondrial (AMT), dynamin‐related protein 1 (DRP1), mitochondrial fission protein 1 (FIS1), mitofusin‐1 (MFN1), and mitofusin‐2 (MFN2) antibodies was performed in 112 cases of head and neck CM and MM. A Cox regression multivariate model was used to assess the correlation of AMT, FIS1, and MFN2 expressions considering the risk for nodal and distant metastasis.

Results

All markers studied presented higher staining in tumor cells than normal adjacent tissues. Higher mitochondrial content was observed in MM than in CM, and it was significantly associated with nodal metastasis in oral melanomas. Both FIS1 and DRP1 expressions were related to advanced Clark's levels in CM, and they were overexpressed in oral melanomas. Moreover, increased immunoexpression of MFN2 was significantly associated with a higher risk of metastasis in CM, and it was also overexpressed in sinonasal melanomas.

Conclusions

Our results suggest that mitochondrial fission and fusion processes can play an important role during multiple stages of tumorigenesis and the development of nodal and distant metastasis in cutaneous and mucosal melanomas.

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