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Exosome micro-RNA as liquid biopsy biomarkers for skin melanomas

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INTRODUCTION

In the last decade, cutaneous melanoma incidence has dramatically increased and early diagnosis is crucial for appropriate tumor management. Liquid biopsy has attracted attention as a non-invasive method for early diagnosis, monitoring and treatment response evaluation. There is an urgent need for new biomarkers to follow up patients with melanoma negative for BRAF and/or NRAS hot spot mutations.

MATERIALS AND METHODS

In this prospective multicenter study, blood samples for miRNA profiling were obtained from consecutive patients with a clinical and dermoscopic suspected diagnosis of melanoma and a control group without melanoma. Seven miRNAs, namely hsa-miR-149-3p, hsa-miR-150-5p, hsa-miR-21-5p, hsa-miR-200c-3p, hsa-miR-134-5p, hsa-miR-144-3p and hsa-miR-221-3p were profiled by quantitative PCR (qPCR) in plasma from patients with malignant melanoma (MM) and age and gender-matched controls.

RESULTS AND DISCUSSION

Our results showed that three out of seven miRNAs, namely hsa-miR-200c-3p, hsa-miR-144-3p and hsa-miR-221-3p, were differentially expressed in plasma-derived exosomes from melanoma patients and controls. Furthermore, the abovementioned miRNAs varied significantly with melanoma stage (I-II vs III-IV). The three biomarkers combined were able to discriminate by ROC curve analysis nevi from melanomas (Figure 1).

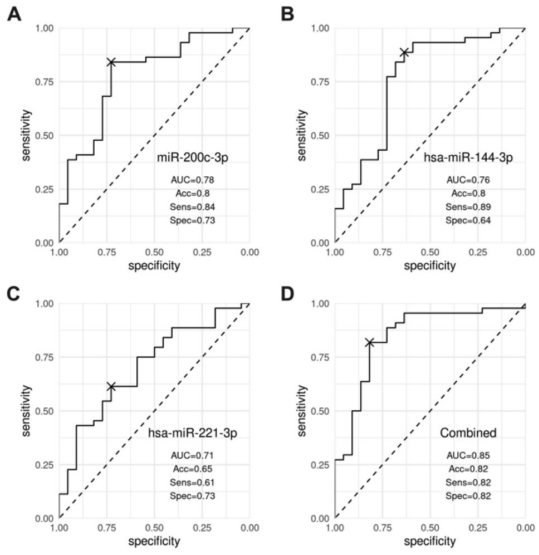

Figure 1. ROC curves representing the specificity and sensitivity of the three micro-RNAs (hsa-miR-144-3p, hsa-miR-221-3p, hsa-miR-200c-3p) in discriminating patients with nevi from those with melanoma considering separately (A-C) or combined (D).

CONCLUSIONS

The combined expression level of hsa-miR-200c-3p, hsa- miR-144-3p and hsa-miR-221-3p resulted to be a strong candidate biomarker for discriminating between nevi and melanoma with high accuracy. If validated, this finding has possible implications both for early diagnosis and follow-up procedures.

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