LRP1 is differentially expressed in HPV negative and HPV positive head and neck squamous cell carcinoma (HNSCC)

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Background

LRP1 is a potential prognostic marker in several cancer entities since its lowered expression is associated with unfavourable clinical outcome1,2. Moreover, LRP1 expression was associated with p53 and p16 alteration3, serpin-protease-complex-clearance4, high-grade and aggressiveness in other tumour entities5,6 – all characteristics of HNSCC.

Methods

After detection of LRP1 and a truncated splice variant (shLRP1) in the HNSC-derived cell lines FaDu and HNS5, RNA of 10 primary HNSCC with and identical TNM status (pT4a pN2b cM0) at time of diagnosis, but despite identical treatment different clinical course regarding either A) a rather short progression-free (PFS) and overall survival (OS) of the patients (n=5) or B) so far event-free survival of the patients (n=5) were analyzed for presence of both LRP1 transcripts. Also the HPV DNA status was assessed.

Results

A
LRP1 [15 kbp]

shLRP1 [1.7 kbp]

B
FaDu HN-5

LRP1 [357 bp]

shLRP1 [291 bp]

GAPDH [270 bp]

Fig. 1: Expression of LRP1 and a truncated splice variant in HNSCC. (A) Compared to LRP1, the mRNA splice variant shLRP1 comprises an alternative exon E7a with a polyadenylation signal resulting in a truncated splice product. (B) Screening of HNSCC cell lines FaDu and HN-5 we detected both LRP1 and – for the first time - shLRP1 mRNA expression.

Fig. 2: LRP1 expression in accordance with OS in HNSCC of identical TNM stage. We found no difference in LRP1 expression in comparison of groups A and B (n = 5). Similarly, we observed no differences in shLRP1 expression comparing both groups.

Fig. 3: HPV status and LRP1 expression in HNSCC of identical TNM status. Comparing HPV-positive to negative HNSCC, we observed a significantly increased LRP1 expression in HPV positive HNSCC (n = 5; * p = 0.0346), whereas shLRP1 expression was unchanged.

Conclusion

LRP1 is differentially expressed in HPV negative and positive HNSCC. Considering its association with HNSCC characteristics and in particular HPV-related effects on p53 and p16, further experiments are now performed to corroborate LRP1 as a prognostic marker or therapeutic target in HNSCC.

References