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ORIGINAL ARTICLE

Clinical significance of Cyclin D1, FGF3 and p21 protein expression in laryngeal squamous cell carcinoma

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Summary

Purpose: *Laryngeal squamous cell carcinoma (LSCC) represents one of the most common cancers of the head and neck and the search for molecular markers is required for early diagnosis, prognosis and optimal therapy. The purpose of this study was to investigate the clinical significance of Cyclin D1, FGF3, p16 and p21 protein expression in LSCC and laryngeal dysplasia (LD) and to evaluate the associations between their expression levels and clinicopathological parameters of patients with LSCC.*

Methods: *Immunohistochemistry was employed to detect and quantify the expression levels of Cyclin D1, FGF3, p16 and p21 in the laryngeal tissues of 48 LSCC patients, 32 patients with LD and 28 subjects with healthy laryngeal mucosa (HLM).*

Results: *Significantly higher percentage of LSCC patients had positive Cyclin D1 expression compared with LD patients and HLM subjects (both $p<0.01$) and positive FGF3 expression than HLM subjects ($p<0.05$), while no differences in p16 and p21 positive expression were found among studied groups. The levels of Cyclin D1, FGF3 and p16 expression, as evaluated by immunostaining score, were significantly higher in patients with LSCC compared with LD and HLM groups (all $p<0.05$). Cyclin D1 proved to be highly sensitive and specific marker in differentiating LSCC from LD (sensitivity 81.2%, specificity 83.9%), while high sensitivity (81.2%) and lower specificity (41.4%) was observed in differentiating from HLM. Cyclin D1 and p21 expression levels were associated with regional lymph node metastases (both $p<0.05$) and Cyclin D1 expression levels significantly correlated with LSCC lymphatic invasion ($x^2=8.862$; $df=3$; $p=0.031$).*

Conclusions: *Cyclin D1, FGF3 and p16 are overexpressed in patients with LSCC. Cyclin D1 is a highly sensitive marker in differentiating LSCC from LD or HLM. Cyclin D1 and p21 expression levels may be useful as predictive markers of metastases in LSCC.*

Key words: *Cyclin D1, FGF3, healthy laryngeal mucosa, p21, laryngeal dysplasia, laryngeal squamous cell carcinoma*

Introduction

Larynx represents a common site of malignant tumors with an incidence rate of 20% for LSCC of all head and neck cancers [1,2]. LSCCs with analogous clinical and histomorphologic features may have variable course and different clinical outcomes, which indicate that TNM staging and histological grading are not sufficient for the prediction of tumor progression [3]. Precancerous lesions are referred to as dysplastic when histopathologic evidence of loss of the normal progressive maturation of cells from the basal layer to the superficial epithelium is present in the absence of invasion. Prognosis and prediction for cancer progression from LD will continue to be based on the histopathological features of LD until more definitive molecular biomarkers are discovered.

Multiple cellular events are believed to occur in the development of LD and LSCC, as proposed

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