

Immunohistochemical expression of NANOG in urothelial carcinoma of the bladder

ABSTRACT

Urothelial carcinoma is a common malignant neoplasm that has a poor prognosis and a high frequency of recurrence and metastasis. Constant disease surveillance with periodic and long term cystoscopy examination is necessary for management of the disease. However, the monitoring and therapy regimen is expensive, incurring a massive burden to patients and the government. Therefore, the development of specific biomarkers for urothelial carcinoma at an early stage and recurrence detection becomes a priority. Homeobox genes are a family of genes that are involved in tumorigenesis. They might be potential prognostic markers for urothelial carcinoma. The study investigated the expression pattern of NANOG which is one of a homeobox gene in different stages and grades of urothelial carcinoma. NANOG expressions were also correlated with patient demographic factors and clinicopathological parameters. The expression of NANOG in 100 formalin-fixed paraffin-embedded urothelial carcinoma tissues was determined by immunohistochemistry. Immunohistochemistry showed positive expression of NANOG in all specimens with detection in the cytoplasm, nuclei and the nuclear membrane of the cancer cells. The immunohistochemical expression of NANOG increased across stages and grades of the tumour. The expression of NANOG was not significantly associated with demographic factors; gender ($p = 0.376$), race ($p = 0.718$) and age ($p = 0.058$) as well as with most of the clinicopathological parameters; pathological stage ($p = 0.144$), grade ($p = 0.625$), lymph node involvement ($p = 0.174$) and distant metastasis ($p = 0.228$). However, NANOG expression showed significant correlation with tumour invasion ($p = 0.019$). We concluded that NANOG might be a potential biomarker for early diagnosis of urothelial carcinoma of the bladder.

Keyword: Homeobox genes; NANOG; Urothelial carcinoma; Immunohistochemistry; Histopathology