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Expression of stem cell markers CD133 and OCT4 in rectosigmoid adenocarcinoma and their predictive significance of response to chemotherapy and\or radiotherapy

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Background: Colorectal cancer is the third most common cancer in men and the second most common cancer in women worldwide. Recently, Cancer Stem Cells (CSCs) have received attention due to their role in cancer initiation, progression and metastases. Their ability of self-renewal, unlimited proliferation, and multi-potency are considered cancer stem-cell phenotypes, and they seem to be responsible for local relapse and metastasis by inducing resistance against traditional drug therapy. Methods: In this study, we evaluated the immune-histochemical expression of OCT-4 and CD133 in 30 cases of rectosigmoid adenocarcinoma which received neo-adjuvant chemo-radiotherapy in relation to other clinic-pathological features of the tumor. Results: Negative OCT-4 expression was noted in 17 cases with the scores less than 4. Positive OCT-4 expression was observed in 13 cases with the scores equal to or more than 4. A significant relationship was found between OCT-4 and tumor stage (P=0.029). And significant relationship was found between OCT-4 and clinical response (P=0.010). 10 cases out of 30 were negatively stained by CD133, while the other 20 cases were positively stained. Positive stained samples further classified into high expression (12 specimens) and low expression (8 specimens). No statistically significant relationship was found between CD133 and different clinic-pathological parameters as patient's age, sex, tumor stage, grade, LN status, clinical response and pathological response to chemo-radiotherapy. Conclusions: We concluded that the expression of OCT-4 is significantly positive correlated with tumor stage which might indicate that OCT-4 expression is a poor prognostic factor in CRC. The expression of OCT-4 is significantly correlated with good clinical response to chemo-radiotherapy. The mean age for development of CRC is lower in the Egyptian population than the western countries.

Gallbladder cancer (GBC) is the most frequent biliary tract cancer, with high morbidity and poor prognosis, and shows early metastasis and invasiveness. No reliable biomarkers are available for detection of GBC progression. Aim: To investigate the immunohistochemical expression of Oct-4 and CD133 in malignant and nonneoplastic lesions of gallbladder and to analyze the clinical significance of the expressions related to clinicopathological parameters. Settings and Design: This is a prospective case control study, conducted in medical college background. Materials and Methods: A total of 103 cases of gallbladder were grouped into malignant lesions (n = 48) and nonneoplastic lesions (simple epithelial hyperplasia; n = 35 and chronic cholecystitis; n = 20). All tissue samples were evaluated for expression of Oct-4 and CD133 using immunohistochemistry in an effort to elucidate the correlation between their expressions with clinicopathological parameters. Statistical Analysis: The final score was calculated by multiplying the intensity to the percentage of positive cells. The scores ≥2 were considered as positive. Results: Significant positive correlation of higher expression levels of Oct-4 and CD133 were observed in malignant as compared to nonneoplastic lesions of gallbladder ($P < 0.0001$). High expression of Oct-4 and CD133 were significantly associated with tumor grading (Oct-4, $P = 0.04$; CD133, $P = 0.02$), staging (Oct-4, $P = 0.03$; CD133, $P = 0.02$), and liver metastasis (Oct-4, $P = 0.01$; CD133, $P = 0.007$). Significantly reduced survival was observed with high expression of Oct-4 ($P = 0.002$). No significant correction was observed between CD 133 and survival. Conclusion: This study revealed that high expression level of Oct-4 may provide a new insight for the prognosis of the disease in terms of clinical staging and grade

t is ten times more common in North India than in South Indian population.[1],[2] GBC is a leading cause of cancer death in women. Most of the GBC cases are typically diagnosed at the advanced stages because of lack of clinical appearance, which are nonspecific and majority of cases are found incidentally at the time of histopathological examination for cholecystectomy.[3] GBC is reported with high rate of recurrence and metastasis due to poor response to chemotherapy and radiotherapy.[4] Convincing evidences report that gallbladder stones are found to be strongly associated factor that causes inflammation, which is considered as main carcinogenic mechanism for GBC development, but their exact role as a cause for GBC is still not clear.[5]

In this study, it was concluded that positive significant correlation of Oct-4 and CD133 expression was found in malignant lesions as compared to nonneoplastic lesions of gallbladder. Positive significant correlation was also observed in tumor differentiation clinical staging and liver metastasis. These findings focus on the prognostic role of Oct-4 and CD133 in GBC. Thus, these markers might in future become important biomarkers for detection of progression of GBC.

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