

Evaluation of the changes in the expression levels of miR-141 and *SHP* gene in prostate cancer specimens

Introduction: Primary screening tests currently used for prostate cancer (PCa), don't have sufficient sensitivity and specificity. Therefore, early diagnosis and management of treatment is one of the challenges faced by physicians. Today, more familiar with the signaling pathways involved in the pathogenesis of cancers, several molecules have been introduced as diagnostic biomarker or drug design. The androgen receptor is one of the most important pathways involved in the pathogenesis of PCa. The miR-141, as a member of the miR-200 family has a regulatory role by targeting the Small heterodimer partner (*SHP*, *NROB2*) at the downstream of this molecular pathway. **Objective:** The aim of this study was to investigate changes in the expression of miR-141 and *SHP* in tissue samples of PCa patients compared to benign prostatic hyperplasia (BPH) tissues. **Method:** In this study, changes in expression of miR-141 and *SHP* at the RNA level were performed using qRT-PCR technique on 68 prostate tissues containing, 26 localized PCa, 4 metastatic PCa, 30 BPH and 8 tumor-adjacent normal tissues. Also, the analysis of the results was investigated using REST software. Changes in *SHP* expression at protein level were investigated in 20 Paraffin-embedded tissue blocks containing 10 PCa and 10 BPH using immunohistochemistry (IHC). **Results:** The findings of this study showed that miR-141 increased in metastatic samples compared with localized samples ($P < 0.001$, 31.17-fold change). Tumor samples showed a lower expression level of *SHP* compared with *BPH* tissues at mRNA and protein level ($p = 0.014$, 4.7 fold change) and ($p = 0.02$, 1.8 fold change), respectively. **Conclusion:** According to our results, it can be concluded that miR-141 plays a role in the pathogenesis of PCa through the androgen receptor signaling pathway and the *SHP* regulation. Also, miR-141 has a high potential for diagnosis of PCa as a prognostic biomarker.

Keywords: Prostate cancer, *SHP* gene, miR-141, Biomarker