

## Immune Histochemical Evaluation of Cyclin D1 in Prostatic Adenocarcinoma and Benign Prostatic Hyperplasia in Small Needle Biopsy of Sudanese Patient

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### Abstract:

*The purpose of this study was to investigate the relationship between cyclin D1 expression in patients with prostate carcinoma. We assessed cyclin D1 expression by conventional immunohistochemistry in 50 patients with prostate carcinoma, Cyclin D1 staining was positive (cyclin D1 expression in of prostate cancer) in 17cases (58,6%) and negative (cyclin D1 expression in in prostate cancer ) in 12 cases(41,4%) (including all cases with no immunostaining). Cyclin D1 expression was not associated with Gleason score. Our results suggest that high cyclin D1 expression could be a potential marker for prostate cancer.*

**Key words:** Immune Histochemical Evaluation of Cyclin D1, Prostatic Adenocarcinoma, Benign Prostatic Hyperplasia, Small Needle Biopsy, Sudanese Patient

## **1. INTRODUCTION**

Prostate carcinoma is the most common malignant tumor in men older than 50 years of age and is characterized by a highly variable clinical course (1,2). Accordingly, many potential prognostic markers have been extensively studied. Tumor markers enable cancer screening, differentiation between benign and malignant tumors, assessment of prognosis, therapeutic monitoring, and detection of tumor recurrence. Tumor markers have been closely evaluated to identify proteins that mediate and participate in tumor cell cycle progression.

Cyclin D1 is a short-lived nuclear protein that is degraded by the ATP ubiquitin-dependent proteolysis pathway and is involved in cell cycle transition from G1 (growth) to S phase (synthesis) in both normal and neoplastic cells (3,4). Cyclin D1 overexpression prevents normal cell cycle regulation, causing uncontrolled cell proliferation, abnormal tissue growth, and transformation to a neoplastic phenotype, thereby acting as an oncogene (5). The relationship between cyclin D1 expression and prostate cancer remains unclear. Some studies have shown that cyclin D1 expression in prostate cancer is rare, whereas others report that prostate tumors with high cyclin D1 expression are associated with a more aggressive disease (6-8).

Because the role of cyclin D1 in prostate cancer is unclear, we studied to coleration between immunohistochemical expression of cyclin D1 in prostate adenocarcinoma and BPH in true cut needle biopsy,.

## **2. MATERIALS AND METHODS:**

### **2.1. Materials:**

#### **2.1.1. Subjects:**

Patients (carcinoma group) with age range from 40 to 102 years (mean = 68.2) and Patient (BPH group ) with age range from 60

to 85 years (mean =  $72.5 \pm 3.1$ ) obtained from the department of pathology, Ibn sena hospital and Military hospital during the period from January 2015 to January 2016. were choosed for this study.

### **2.1.2. Samples:**

A total of 50 prostate needle biopsy specimens, including 29 prostate needle biopsy specimens with prostatic adenocarcinoma and 21 BPH The diagnosis of prostate cancer was established from: Examination of multiple levels of H&E-stained sections and was confirmed by two pathologists.

## **2.2.Methods:**

### **2.2.1.Immunohistochemical Analysis**

Immunohistochemical staining was carried out using streptoavidin-biotin immunoperoxidase technique (thermo fisher). Three to five micrometer thick sections, cut from formalin fixed paraffin embedded blocks, were deparaffinized in Xylene and rehydrated in graded alcohol. The mounted sections were immersed in target retrieval solution, tris buffer EDTA (PH 9.0), then boiled in this solution in PT link for 20 min and then washed in phosphate buffer saline (pH 7.2).Then the slides were then incubated 20 minute using a polyclonal anti-cyclin d1 antibody ready to use (thermofisher), After a buffer rinse, bound antibodies were detected with the thermo Envision System. Slides were counterstained with hematoxylin, and rinsed again. The slides were allowed to air dry and were cover slipped with permanent mounting media. Negative controls, in which the primary antibodies were replaced by PBS.

### *Immunohistochemical Evaluation:*

#### *- Evaluation of cyclin d1:*

Results obtained from two sections were detected by the researchers and confirmed by experienced histopathologist.

Negative and positive controls were used for evaluation of the test sections.

Ethical clearance for this studies is provided by ethical committee of AL-Neelain University -faculty of medical labroatory science .

### **2.2.2.Statistical analysis**

The results of the study were statistically analyzed using SPSS version15 statistical program. Data were expressed as mean± SD for quantitative variables, numbers and percentage. For categorical variables,student t test was used. For statistical analysis of Gleason's grading Spearman's statistical test was used.  $P < 0.05$  was considered the significant limit.

## **3. RESULTS:-**

### **3.1. Staining results with cyclin d1:**

Expression of cyclin d1 in malignant glands had much more extensive and intensive staining results than benign glands ( $P=0.005$ ). Prostatic carcinoma showed a brown nuclear staining pattern of cyclin d1 in both the malignant glands and benign glands.

A total of 50 prostate needle biopsy specimens The Frequency of adenocarcinoma in all sample are 29 (58%) while The Frequency of benign prosatic hyperplasia is 21(42%) Table ( 1). Five specimens of prostatic adenocarcinomas were intermediate grade gleason (5-7) and twenty four were high grade Gleason (8-10).

Out of 29 cases of small biopsy of prostatic carcinoma 17 (58.6%) expressed cyclin d1, and 12 did not express cyclin d1 while in 21 cases of small biopsy of Benign prostatic hyperplasia have only 4(19%) expressed cyclin d1 Table(2) .the expression of in prostatic adenocarcinoma is more than BPH which is statically significance ( $P > 0.005$ ).

**Table (1) showing the frequency of prostatic adenocarcinoma and begin prostatic hyperplasia among study population**

Sample	Frequency	Percent
Adenocarcinoma	29	59.0
BPH	21	42.0
Total	50	100.0

**Table (2):-showing the frequency of expression of cyclin d1 among study population**

Diagonosis	cyclin d1 expression		Total
	positive	Negative	
Adenocarcinoma	17	12	29
BPH	4	17	21
Total	21	29	50

#### 4. DISCUSSION:

In our finding we found that the expression of cyclinD1 in prostate cancer (34%) is more than benign prostatic hyperplasia (24%)but some of benign are expressed .

Previous studies (6,7) have shown no relationship between cyclin D1 expression and the Gleason score which is agree with our study, but, in other study, they found a positive statistically significant association between the Gleason score and cyclin D1 expression, with high-grade tumors displaying high cyclin D1 expression compared with low-grade tumors, in agreement with a study conducted by Emin Özbek et al. (21). which is not agree with our study.

#### 5. CONCLUSION

Using cyclin D1 as a positive marker alone might be misleading because weak expression of cyclin D1 might be seen in benign glands . Accordingly, one should not render a diagnosis of benignancy based solely on a negative cyclin D1 immune-stain.

## **6. Acknowledgement:**

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