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Assessment of Ki67 Expression with Different Grades of Prostate Cancer among Sudanese Patients

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Abstract:

Prostate cancer is a major health problem throughout the world, one of the most important prognostic factor is the tumor grade. Ki-67 antigen, which is associated with cell proliferation, has been demonstrated to be useful in predicting the development of human tumors.

*The aim of this study was to **e**valuate the immunohistochemical expression of ki67 as prognostic factor of the prostate and correlate its expression with Gleason's score.*

Methods: A total of 30 cases of formalin-fixed -paraffin embedded blocks of Sudanese male with prostate cancer with different grades were selected from archive of Ibn Sena Hospital, Department of histopathology (Sudan)

Ki-67 marker was carried out on all the samples and the number of labeled cells was quantitatively evaluated (percentage of positive cell /field) by histopathologist.

Results: ki67 had significance correlation with tumor grade p. value 0, 00 .The average age of the prostatic adeno carcinoma was 70 year and

expression of ki67 had no significant correlation with age group (p. value 0.13).

Conclusion: The expression of Ki-67 and the histological grade showed highly significant differences in prostate cancer with p. value 0.00

Key words: Ki67, Prostate Cancer, Sudanese Patients

INTRODUCTION

Prostate cancer, also known as carcinoma of the prostate, is the development of cancer in the prostate, a gland in the male reproductive system.[1] Most prostate cancers are slow growing; however, some grow relatively fast.[2][3]] Prostatic cancer is the second most common cancer of males in the Western societies and in those emulating Western lifestyles and diets. In the year 2012 it was estimated to be 11,500 new cases in the United States. Approximately one in seven American men diagnosed with prostate cancer during their lifetime, making it the most common solid tissue cancer in the United States (7).

In 2012, prostate cancer is the second most frequently diagnosed cancer at 15% of all male Cancers) and the sixth leading cause of cancer death in males worldwide. In Europe in 2012 it was the 3rd most diagnosed cancer after breast and colorectal. Prostate cancer in Sudan according to study done in Ibn Sina Hospital, prostate cancer was found to affect Sudanese patients at elderly age groups (above 50 years old).

The expression of Ki-67 by immunohistochemistry may be a significant predictor of patient outcome for men with prostate cancer.

MATERIAL AND METHOD

This is non-interventional descriptive case study received from the Ibn Sina hospital. All thirty cases previously diagnosed as prostate cancer.

The immunohistochemical procedure was done as follows: Sections (3µm) from formalin-fixed, paraffin-embedded tumors was cut and mounted onto salinized slides (Fisher brand). Following deparaffinization in xylene, slides were rehydrated through a graded series of alcohol and were placed in running water. Samples were steamed for antigen retrieval for KI67 using PT link. Briefly, slides were placed in slide tank containing enough sodium citrate buffer (pH 9.0) to cover the sections, then were boiled at high Temp for 20 minutes then were allow sections to cool at RT. Endogenous peroxidase activity was blocked with 3% hydrogen peroxidase and methanol for 10 minutes, then Slides were incubated with 100-200 µl of primary antibodies for 20 min at room temperature in a moisture chamber, and then were rinsed in Phosphate buffer saline. The primary antibody KI67, (monoclonal) was ready to use (Thermo). After washing with PBS for 3 min, binding of antibodies were detected by incubating for 20 minutes with dextran labeled polymer (Thermo kit). Finally, the sections were washed in three changes of PBS, followed by adding 3, 3 diaminobenzidine tetra hydrochloride (DAB) as a chromogen to produce the characteristic brown stain for the visualization of the antibody/enzyme complex for up to 5 min. Slides were counterstained with haematoxylin. For each run of staining, positive and negative control slides were also prepared. The positive control slides contained the antigen under investigation and the negative control slides were prepared from the same tissue block, but were incubated with PBS instead of the primary antibody. Each slide was evaluated with investigator.

Positive KI67 staining will be identified in form of brown nuclear staining.

The obtained results and variables were arranged in standard master sheet, then were entered a computer program SPSS and analyzed.

Result Interpretation:

Results obtained were detected by researcher and confirmed by experienced histopathologist.

Data analysis:

The data were analyzed using version 16 SPSS computer program; frequencies, means and chi-square correlations were calculated.

RESULTS:

The average age of the prostatic adenocarcinoma was 70 year (range 50- 90 years), and total number were 30 cases of different grades of prostatic adenocarcinoma. 60% of patients were less than 70 years while 40% were more than 70 years.

Figure (1) Expression of ki67 in prostatic adenocarcinoma as determined by immunohistochemical analysis scored as follow 60% scored (5-40), 23.3% scored as (41-75) and 16.7 % were more than 76.

Figure (2) The expression of ki67 had no significant correlation with age group (p. value 0.13 (figure 3) while ki67 had significance correlation with tumor grade p.value 0, 00 (Table 4).

Distribution of Age among study population

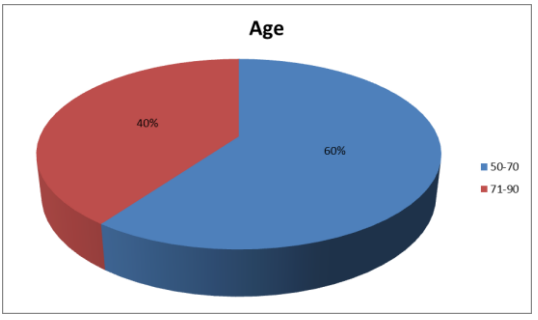


Figure No (1)

Distribution of KI67 expression among study population

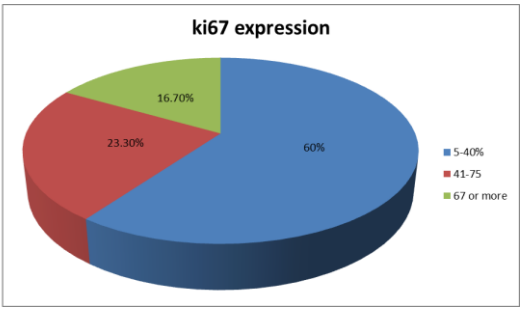
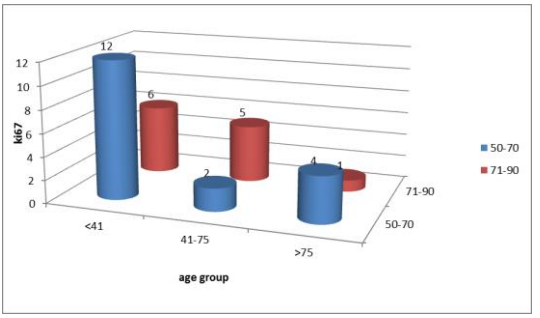


Figure No (2)

Correlation between age and ki67 expression



p-value 0.13

Figure No (3)

Correlation between Grade and ki67 expression

grade	ki67			Total
	5%-40%	41%-75%	76 or more	
grade i	18	0	0	18
grade ii	0	7	0	7
grade iii	0	0	5	5
Total	18	7	5	30

P. value 0.000

Table No (1)

DISCUSSION

Prostatic cancer is one of the serious types of carcinomas that affect men all over the world. Although no strong data is available, significant increase of the disease is noticed in Sudan. In this study the expression of Ki67 in 30 cases of prostatic adenocarcinoma was evaluated.

The predictive value of the labeling index by Ki-67 has special importance in the types of cancers in which it is difficult to predict the clinical course by histological criteria. There are numerous studies that analyze this predictive value in carcinoma of the prostate, although there is a great variability of results. Our study found that there is no significant correlation with age p.value 0.13 while there was significant correlation with tumor grade this finding is similar finding of Verma and his colleague in 2015 which found that there was significant correlation between ki67 ,p53 and gleason's grade .Also Marian and others found the same finding with p.value 0.004

Also Bubendorf and his coworker (8), who found significant association between Ki67 expression and aggressive of the tumors. Fisher stated that Ki67 scoring in prostatic excisional biopsies is practicable and yielded significant prognostic information, whereas Ojea Calvo included that the prognostic value of Ki67 is less effective than the classical factors as PSA and Gleason's score (9).

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