Immunohistochemistry Expression of Ki-67 in Nodular Hyperplasia, Prostatic Intraepithelial Neoplasia and Adenocarcinoma Prostate

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Abstract: Immunohistochemistry Ki67 is a marker of cell proliferation. This descriptive study was performed in the Department of Anatomical Pathology Universitas Sumatera Utara, Medan, Indonesia. A total of 86 paraffin blocks prepared from transurethral resection of the prostate (TUR-P) were collected in this study. The specimens divided as three lesions; nodular hyperplasia, prostatic intraepithelial neoplasia (PIN) and adenocarcinoma prostate. In this study a total of 86 specimens from TUR-P, we divided them using IHK p63 as three lesions; (1). Nodular hyperplasia prostate, frequency 31 (36%), (2). Prostatic intraepithelial neoplasia 17 (19,8%), and (3). Adenocarcinoma prostate 38 (44,2%). Our results show the expression Ki67 in nodular hyperplasia is (9.65 ± 11.577), median: 5; Prostatic intraepithelial neoplasia (14.71 ± 14.67), median 7 and adenocarcinoma prostate (57.53 ± 27.57), median 50. This study concluded that in prostate tissue examination, immunohistochemistry expression of Ki67 are different in nodular hyperplasia, PIN and prostate adenocarcinoma. Whereas the expression of Ki67 is higher in adenocarcinoma than PIN and nodular hyperplasia.

1 INTRODUCTION

In 1980 Ki-67 antigen was identified by Scholzer and Gerdes. This antigen was encoded with two protein isoform which weight are 345 and 395 kDa. Ki67 is achive in G1, S, G2 and M, but decrease sharply in anaphase and telophase, but inactive in phase G0. It has ~1-1,5 h half-life. Ki-67 expression could be used as a marker of tumor aggressiveness since its expression is related to proliferative activity of intrinsic cells of malignant tumors. Several studies have showed its potential as prognostic marker in breast, soft tissue, lung, prostate, cervix and central nervous system. The St. Gallen consensus panel has recommended Ki67 as a marker to differentiate luminal A and luminal B subgroups of IBC. At 2015 St Gallen Breast Cancer Conference, define 20-29% as cut-off value of Ki-67 to differentiate luminal B-like subgroup.

A number of studies, using pKi67 as a diagnostic tool, prognostic tool and a potential target for cancer therapy. Ki67 is frequently used as an indicator of cell proliferation. A number of diagnostic applications for pKi67 have been described, where Ki67 was significantly more highly expressed in malignant than in normal tissues. pKi67 also tended to increase with decreasing tissue differentiation, and it was correlated with the presence of occult metastasis and the clinical stage of tumors. Several studies have shown correlation between proliferative markers and tumor grade to determine prognostic factor of the disease.

The purpose of this study is knowing the expression of Ki67 in nodular hyperplasia, prostatic intraepithelial neoplasia (PIN) and prostate adenocarcinoma.

2 MATERIAL AND METHODS

This descriptive study was performed in the Department of Anatomical Pathology Universitas Sumatera Utara, Medan, Indonesia. A total of 86 paraffin blocks prepared from transurethral resection of the prostate (TUR-P) were collected in this study. These specimens divided as three lesions; nodular

hyperplasia, prostatic intraepithelial neoplasia and adenocarcinoma prostate.

Each paraffin block was recut into serial section and stained by Hematoxylin and Eosin, immunohistochemistry p63 and Ki67. The block paraffin was section into 2 to 3 μ, then prepared and stained with p63 immunohistochemistry to make sure that the lesion was diagnosed as PIN or malignant lesion. We used the REAL EnVision method to p63 immunohistochemistry staining with 1:100 dilution and Ki67 1:200. The interpretation of p63 used, continuous expression as a benign lesion, discontinuous as a premalignant lesion (PIN) and no expression from basal cell glandular as a malignant lesion (adenocarcinoma). The positive control was tonsil tissue for Ki67 and positive staining was identified by the presence of brown nuclear stain (DAB) in 100 tumor cells considered as positive staining.

Eligibility criteria: (1). Inclusion criteria, block paraffin from TUR-P specimens with ≥ 100 cells of population tumor; (2). Exclusion criteria is inadequate populations of tumor cells and poorly preserved prostatic specimens were excluded.

3 RESULTS

In this present study a total of 86 specimens from TUR-P. We divided them using IHK p63 as three lesions; (1). Nodular hyperplasia prostate, frequency 31 (36%), (2). PIN 17 (19,8%), and (3). Adenocarcinoma prostate 38 (44,2%). Our results showed the expression Ki67 in nodular hyperplasia is (9.65 ± 11.577), median: 5; PIN (14.71 ± 14.67), median 7 and adenocarcinoma prostate (57.53 ± 27.57), median 50.

4 DISCUSSION

Prostatic carcinoma is one of the most prevalent types of carcinoma in men. The early diagnosis of carcinoma can be done by early detection of focus premalignant lesions of the prostate only from the histopathology examination. To diagnose benign or malignant lesions from prostate tissue the one of the criteria is that we can see intact or discontinue basal cell layer, whereas in malignant lesions does not expressed [26,27]. In this study we have done using IHK p63 to determine nodular hyperplasia, PIN and adenocarcinoma. Our results showed the expression

of Ki67 is higher in adenocarcinoma prostate, PIN and nodular hyperplasia.

Ki67 is often used as an indicator of cell proliferation. Several of diagnostic applications for pKi67 described that Ki67 was significantly more highly expressed in malignant than in normal tissues. Uncontrolled proliferation is a sign of malignancy and the measurement of Ki67 antigen by using IHC is the most widely performed assessment of a tumor's proliferation potential.

5 CONCLUSIONS

This study concluded that in prostate tissue examination, immunohistochemistry expression of Ki67 are different in nodular hyperplasia, PIN and prostate adenocarcinoma. Whereas the expression of Ki67 is higher in adenocarcinoma than PIN and nodular hyperplasia. It means Ki67 may be helpful in differentiation between nodular hyperplasia, PIN and prostate adenocarcinoma.

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