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KI-67 EXPRESSION IN INVASIVE DUCTAL AND INVASIVE LOBULAR CARCINOMAS OF BREAST

Pathology

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ABSTRACT

Aim: To study the expression of Ki-67 in invasive ductal and invasive lobular carcinomas of breast and analyze its utility in predicting the response to chemotherapy and as a prognostic marker. Materials and methods: A total of fifty breast carcinoma specimen were investigated comprising of forty invasive ductal carcinomas and ten invasive lobular carcinomas. Haematoxylin and Eosin slides of all the tissues were evaluated.The formalin fixed, paraffin embedded blocks were sliced in 3-4 µm thickness for IHC. The Avidin Biotin complex (ABC) detection system was used. Immunoreactivity was regarded as positive when brown staining was localized to the nucleus of the tumor cells. Results: Ki-67 expression was observed in invasive ductal carcinoma(IDC) and invasive lobular carcinoma(ILC) and graded as low, intermediate and high.
Conclusion Out of the 40 cases of invasive ductal carcinoma Ki67 was found to have high expression in 20 (50%) patients, intermediate expression in 13(32.5%) patients and low in 7(17.5%) patients. Out of the 10 cases of invasive lobular carcinoma Ki-67 was found to have high expression in 5(50%) patients intermediate expression in 3(30%) patients and low expression in 2(20%) patients.

KEYWORDS:

Ki-67 , breast carcinoma ,prognostic marker

INTRODUCTION

Breast cancer is the most common malignancy occurring in females, accounting for 23% of all malignant tumors. Over one lakh new breast cancer patients are estimated to be diagnosed every year in India. [1] Carcinogenesis is associated with the development of proliferative and morphological abnormalities, measurement of the proliferative activity will be useful to help in predicting the course of the disease and to decide on an appropriate management.

Ki67 is a proliferative marker which has been studied extensively in the recent past. Ki-67

was identified by Gerdes et al in 1991[2]. The Ki-67 protein was originally defined by the prototype monoclonal antibody Ki-67, which was generated by immunizing mice with nuclei of the Hodgkin lymphoma cell line L428. The name is derived from the city of origin (Kiel, Germany) and the number of the clone number in the 96-well plate[3].

Antigen Ki67 is encoded by the MKI 67 gene in humans. Ki-67 protein is a cellular marker for proliferation. This nuclear protein is expressed in proliferating cells during G1 through M phases of the cell cycle, but is not detected in resting cells. The Ki-67 expression as detected by immunohistochemistry is one of the most reliable indicators of the proliferative status of cancer cells.[4]

In 2009, at the St-Gallen breast cancer conference, Ki-67 was recommended as a biomarker for prognosis and sensitivity of cancer cells to endocrine therapy or chemotherapy.[5]

Ki67 has repeatedly been confirmed as an independent predictive and prognostic factor in breast cancer.[6] Breast cancer with high Ki67 expression responds better to chemotherapy but is associated with poor prognosis.[7,8]

In this retrospective study we have analysed the expression of Ki67 in invasive breast carcinomas and evaluated its utility as an independent predictive and prognostic marker.

MATERIALS AND METHODS

A retrospective study at the Meenakshi Medical College and Research Institute Hospital, Kanchipuram. The study was performed on formalin fixed, paraffin embedded blocks of diagnosed cases of invasive ductal carcinoma and invasive lobular carcinoma of breast during the period of June 2015 until June 2017.

Fifty cases of invasive breast carcinomas were taken up for the study. Out of which 40 were of invasive ductal carcinoma and 10 of invasive lobular carcinoma. The formalin fixed, paraffin embedded blocks were sliced in 4µm thickness and applied on positively charged slides for immunohistochemical staining(IHC). Antigen retrieval was done following which the slides were subjected to the Ki 67 antibody (primary antibody) and the biotinylated link (secondary antibody). After that a DAB - substrate chromogen solution was applied that formed a coloured deposit. Any nuclear staining observed was considered as positive. Grading was done by observing the nuclei of 500 cells in 3-5 high power field(40x).

INCLUSION CRITERIA

Diagnosed cases of invasive ductal carcinoma and invasive lobular carcinoma.

EXCLUSION CRITERIA

Ductal carcinoma in-situ and lobular carcinoma in-situ

Grading

Immunostaining was considered is positive when the nucleus of the tumor cells were stained brown. 500 tumor cells were counted over 3-5 high power fields(40x) Levels of Ki-67 was graded as low (immu nostaining <15%) , intermediate (between 16 to 30%), high (immunostaining ≥30%), and approach adopted by St Gallen International Expert Consensus[5].

RESULTS

Fifty diagnosed cases of invasive breast carcinoma were selected randomly, their ages ranging from 20 to 70 years.Cases diagnosed as invasive ductal and invasive lobular carcinoma were taken up for study. The expression of Ki67 was evaluated in all the cases. The observations have been put up in table 1 and table 2

Table 1: Cases included in the study

Type of cancer	Number of cases	Percentage
IDC	40	80
ILC	10	20
TOTAL	50	100

Table 2: Grading of the cases

Grade	Immunostaining	IDC	ILC		
		No.of cases	%	No. of cases	%
Low	<15%	7	17.5	2	20
Intermediate	16-30%	13	32.5	3	30
High	>30%	20	50	5	50
Total		40	100	10	100

CONCLUSION

Out of the 40 cases of invasive ductal carcinoma Ki67 was found to have high expression in 20 (50%) patients, intermediate expression in 13(32.5%) patients and low in 7(17.5%)

patients.

Out of the 10 cases of invasive lobular carcinoma Ki-67 was found to have high expression in 5(50%) patients intermediate expression in 3(30%) patients and low expression in 2(20%) patients Several studies have shown that breast cancer with high Ki67 expression responds better to chemotherapy but is associated with poor prognosis.The utility of Ki67 immunostaining as an independent predictive and prognostic marker has been extensively studied. In this study we have analysed the expression of Ki67 and graded it into high, low and intermediate grade.

Our results may contribute to show the utility of Ki67 as an independent marker for predicting the patients response to therapy and the prognosis.

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