RESEARCH ARTICLE

IMMUNOHISTOCHEMICAL CORRELATION OF E-CADHERIN EXPRESSION WITH DIFFERENTIATION GRADE OF INVASIVE DUCTAL CARCINOMA IN SUDANESE FEMALES

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ABSTRACT

Background: E-cadherin is a cell surface protein involved in cell adhesion, present in normal breast epithelium, and in certain breast carcinoma. The utility of the E-cadherin immunohistochemical stain to distinguish between lobular and ductal carcinomas that are difficult to classify by morphologic features alone has been well-documented.

Objectives: this study aimed to investigate E-Cadherin expression in invasive ductal carcinoma of different grades of differentiation and correlated the expression patterns with their histological type and grade using immunohistochemical staining.

Materials and methods: Formalin fixed-Paraffin embedded blocks from 50 female patients with invasive ductal carcinoma were used, immunohistochemistry staining for E-cadherin was performed and the intensity and extension of E-Cadherin immunoreactivity was evaluated as normal or loss of expression in all 50 cases of different grades invasive ductal carcinoma and correlated with their histological type and grade.

Results: 72% of cases showed normal expression of E-cadherin and 28% had loss of expression, we found that loss of expression of E-cadherin increase with increase of tumor grade from 2% for Grade 1 to 16% in Grade 3 tumor. But statistical analysis showed no significant association p value (0.920).

Conclusion: we conclude that there is no statistical significant Loss of E.cadherin expression in invasive ductal carcinoma grades in Sudanese patients.

INTRODUCTION:

Breast cancer is the most frequent diagnosed cancer in females, and the second leading to death in women patient. Invasive ductal carcinoma of the breast is main infiltrating carcinoma, it's also called carcinoma of no special type or infiltrating ductal carcinoma, origin from breast milk duct and invades surrounding breast tissue (1) few studies in breast cancer observed the relation between E.cadherin expression and tumor grade (6, 4, 7), E-cadherin is transmembrane glycoprotein that mediates calcium and involve in epithelial cell-cell adhesion, E-cadherin is tumor suppressor protein ,that its protein correlate with development and prognosis of tumor(9), loss or reduce of E-cadherin expression associated with high histological grade and increase tumor dedifferentiation , metastatic potential and invasiveness in human cancer (6)especially carcinoma of the breast.

Based on this information we studied correlation of E-cadherin expression in invasive ductal carcinoma with histological tumor grade.

MATERIALS AND METHODS:

Fifty (50) formalin-fixed -paraffin embedded blocks of Sudanese female with invasive ductal carcinoma were selected from archive of Histopathology department in Radiation and isotope center -Khartoum, evaluation of histopathology was made on 3 micron thick sections stained with hematoxylin and eosin, and the grading assessed by two consultants Histopathologist using Nottingham grading system of Elston and Ellis(11).

Immunohistochemistry:

Paraffin embedded blocks were cut at 3Mm and mounted on salinized slides, deparaffanization in xylene and then rehydrated through graded series of alcohol. Antigen retrieval was performed by using PT link, endogenous

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peroxidases activity was blocked with 3% hydrogen peroxidase and methanol for 10 minutes, then incubated with 100\200 ML of primary antibodies for 20 minutes at room temperature , rinsed in phosphate buffer saline, and binding of antibodies was detected by incubating 20 minutes with system(Thermo -ultra vision) , finally, the sections were washed in three changes of PB , visualization of the positive reaction with 3,3 diaminobenzidine and counter-stained with hematoxylin

Statistical analysis:

Gross tabulation was used during the statistical analysis using SPSS package version 18 and chi-square test was assessed to correlate between expression of E-cadherin and tumor grade, we found no statistically significant relation with p value (0,920).

Ethical clearance for this study is provided by ethical committee of Faculty of medical laboratory sciences –AL-Neelain University, Khartoum, Sudan.

RESULTS:

All patients included were females, the average age of the invasive ductal carcinoma was 55 year (range 29- 80 years), and total number were 50 cases of different grades invasive ductal carcinoma.

Expression of E-cadherin was evaluated as normal (positive) or loss (negative) of immunoreactions.

E-cadherin expression in invasive ductal carcinoma were detected in 72 %(36/50) of the cases which showed normal E-cadherin expression, and 28 %(14/50) of the cases showed loss of expression of E-cadherin, depicted in figure (1).

Correlation between E-cadherin expression and histological grade of invasive ductal carcinoma is shown in table (1), and we have noticed loss of expression of E-cadherin increase with tumor grade, which detected in grade3 (16%) higher than that in grade1and grade2 tumor (2, 10%), but p value in statistical chi-squire analysis was not significant (0.920) figure (2).
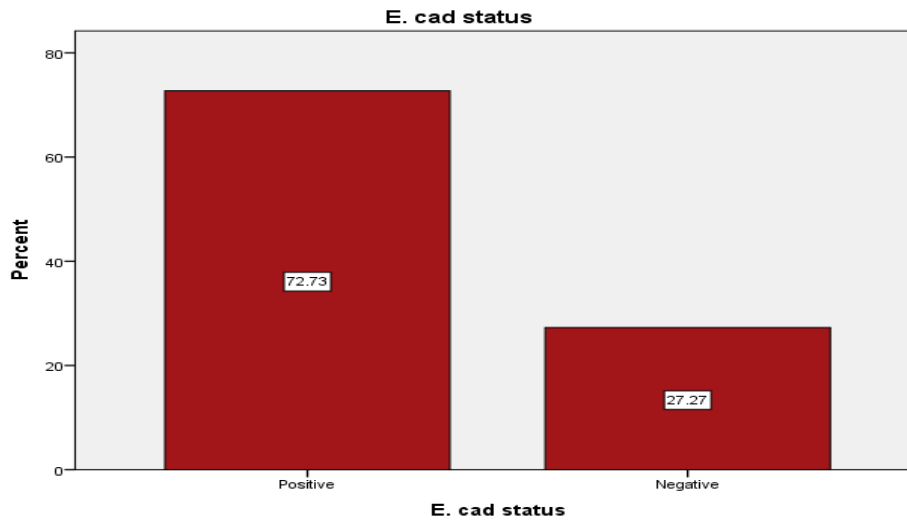

Figure 1: shows percentage of invasive ductal carcinoma with normal and loss E.cadherin expression.
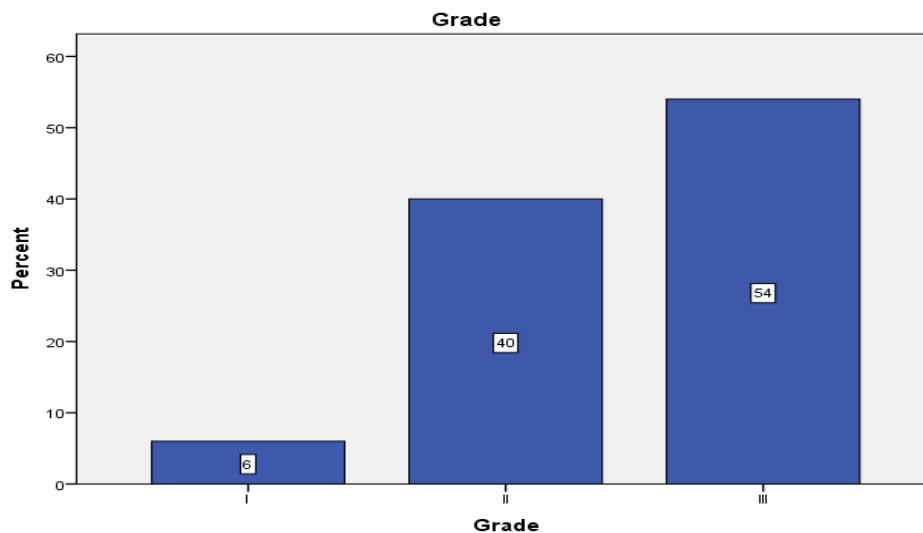

Figure 2: shows the percentage E.cadherin expression in the different grades of invasive ductal carcinoma.

Table 1: shows the correlation between Expression of E-cadherin and histological grade in invasive ductal carcinoma among the study population.

		E.cadherin expression status n (%)	
	Total	+ve	-ve
Number of cases n (%)	50	36 (72)	14(28)
Histological grade(G) G l	3	2(4)	1 (2)
GII	20	15 (30)	5 (10)
GIII	27	19 (38)	8 (16)

DISCUSSION:

Loss of E-cadherin expression is playing role in invasion and migration, tumor stage, prognostic factor and sub classification of breast carcinomas, it was connected with high level of malignancy (4, 5, and 2), and the grade of breast cancer is very important prognostic factor, help in diagnosing and treatment of patients.

Recent studies focused on E.cadherin expression in diagnosis of breast cancer, but in our knowledge there are no current study in Sudan specifically correlates between expression of E-cadherin and histological grade in invasive ductal carcinoma. So in the current study we tried to shed light in tumor grades and E-cadherin expression pattern, in which we found that the loss of E-cadherin expression increase with grade of invasive ductal carcinoma, but statistically not significant with p value (0.920), and this result consistent with the results detect by Kowalski PJ et al (10) which they found E.cadherin expression is not lost in invasive ductal carcinoma.

In contrast to our result, *Gamallo C* et al, *Oka H et al and HEIMANN R* et al (7, 4, 8) found that the percent of E-cadherin expression increase with tumor grade. More interesting *C.SUCIU et al and Moll R et al finding* have shown that the percent of the tumors with aberrant expression of E-cadherin decrease with increase of tumor grade (5, 3).

In conclusion, our result showed no statistical significant correlation between E.cadherin expression and histological tumor grade in invasive ductal carcinoma in Sudanese females and this study limitation might be explained by few sample size number of cases and heterogeneous Sudanese population.

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