UTTAR PRADESH JOURNAL OF ZOOLOGY

42(24): 514-518, 2021
ISSN: 0256-971X (P)

THE HISTOPATHOLOGY AND PREDICTIVE INDICES OF CARCINOMA BREAST WITH SPECIAL REFERENCE TO p53 MARKER

MEERA BALAKRISHNAN [a] AND R. S. NANCY [a*]

[a] Department of Pathology, Sri Lakshmi Narayana Institute of Medical Sciences Biher, India.

AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Ana Cláudia Correia Coelho, University of Trás-os-Montes and Alto Douro, Portugal.
Reviewers:
(1) Panat Anuracpreeda, Mahidol University, Thailand.
(2) Davoud Balarak, Zahedan university of medical sciences, Iran.

Received: 09 October 2021
Accepted: 18 December 2021
Published: 20 December 2021

Original Research Article

ABSTRACT

Breast cancer is recorded as the one of the most common carcinomas in woman and causing approximately 22% death in female population worldwide. Nearly, 26% of the women are affected in developing and under developed countries. The areas of affluent populations with high risks are North America, Europe, and Australia. The breast cancer evolved as a commonest cancer among Indian women and followed by cervix cancer. Nationally, 19-34% of all cancer accounts among women. All the data are collected from in our country of India. In the present study, 80 cases of Invasive carcinoma of breast were studied. 50 cases were subjected to immune histochemistry Non-biotin HRP system is superlative system for diagnosing the BC and the results showed that the p53 oncoprotein over expression was 30%. Nuclear p53 accumulation can be associated with high morphological grade in general and with tumor cell proliferation and not necessarily with biological aggressiveness. P53 over expression was significantly seen in poorly differentiated nuclear grade tumors.

Keywords: Brest cancer; p53; malignancy; immune expression; over expression; prognosis.

1. INTRODUCTION

Western world sides significantly increasing and imminent of breast cancer is one of the major carcinomas in women and the reason for death in women population next to heart attack in India. The first being carcinoma of cervix [1,2]. The BC seemed to be in 22% of all female cancers patients worldwide particularly in North America, Australia and Europe, whereas areas of low risk are sub-Saharan Africa, Southern and Eastern Asia [3].

Breast being constantly under the varying influence of sex hormones, carcinoma of breast is associated with morbidity and mortality among woman of reproductive age group. This frequency of disease in

**Corresponding author: Email: nancyreginalds@gmail.com;*

woman has prompted intensive study on risk factors in a developing breast cancer to gain clues to identify modifiable risk factor that would be obliging for valuation of prognosis, prevention strategies, and treatment modalities [4,5]. Since it has many altered pathways, it seemed to be a dangerous disease. p53 mutation strongly lead to development of tumor [6-8]. Approximately 80% of the p53 point mutations present inhuman cancers are located in the DNA binding domain of the protein. Mutated p53 protein does not bind to DNA and blocks the activity of normal protein. Normal p53 protein is called into apply emergency brakes in the cell cycle.

The DNA damage increase the p53 levels resulting in DNA repairing enzymes expression of such as DNA dependent protein kinase and ATM (ataxia-teleangiectasia mutated) or activated in response. Those enzymes phosphorylate p53 and the protein then unfolds is able to bind to DNA and becomes an active transcription factor. p53 and prevent the cell cycle [8]. Most of mutant p53 proteins show extended half-life and the tumors have developed the mechanism that reduces the expression of the proteins that extend its half- life [7,9-12]. An attempt is made to find out the association of p53 mutations among the 50 accessible cases of carcinoma breast using immune histochemistry and associating the discoveries in respective parameters.

2. MATERIALS AND METHODS

2.1 Methods

80 cases diagnosed as sarcoma of breast on H&E stained pieces in the Department of Pathology, BIHER, during the period of April 2009 and September 2011 were included in the present study. The biopsy material includes lumpectomy specimens, true cut biopsies and radical mastectomy specimens. The clinical details with reference to age and presenting complaint were recorded. The data were analyzed the age incidence, and p53 immunoexpression. H&E stains were reviewed. The 80 cases of breast Nottingham combined histological grading system was used the scoring accordingly. The scores were given based on the parameters such as tumor size, tumor grade, lymph node status. 4-micron sections were derived from 50 participants and were subjected to immunohistochemical staining [13].

2.2 Materials

50 tissue sections were taken for present study to appraise histopathological and extrapolative directories of Breast cancer with reference scored by p53expression. The subject for trainings includes the following - Age group between 25–75; Postmenopausal and premenopausal women. The erased tumor specimen was fixed in 10% buffered formalin. The gross features were noted. The paraffin blocks were made from the representative tissue sections. Thereafter, they were cut into 3-5 microns thin sections in order to perform the H & E (Hematoxylin and Eosin) staining for histopathological evaluation as well as for immunohistochemical studies [14].

Tissue response by inflammatory cell infiltration, Desmoplastic reaction and necrosis. Desmoplastic reaction, inflammatory cell infiltrate, and necrosis were observed subjectively. They were divided into 3 categories - mild, moderate, and severe depending on the degree of involvement. The entire sections of representative slides were screened completely and the presence of desmoplasia, inflammatory cell infiltrate and necrosis were evaluated. Involvement – Category less than 50% - mild, 50 to 75% - moderate, > 75% - severe.

Classification of histopathological grading of Nottingham modification by the Bloom Richardson method. Nottingham Prognostic Index. [NPI].

> NPI = [Size of the tumour mass (cm) X 0.2 + Lymph node stage (1-3) + grade (1-3)]

Immunohistochemistry lmmunohistochemical staining is done by indirect technique (super, sensitive non-biotin HRP detection system) using biogenex anti p53 protein [D07] from mouse. The immunohistochemical staining was carried out according to the previous method.

3. RESULTS AND DISCUSSION

3.1 Data Collection

A total of 80 mastectomy specimens were studied from April 2009 to June 2011 in the Department of Pathology, Bharath Institute of Higher Education and Research. Out of 80 cases of invasive breast cancers, clinical pathological evaluation was done in 50 cases according to p53 expression.

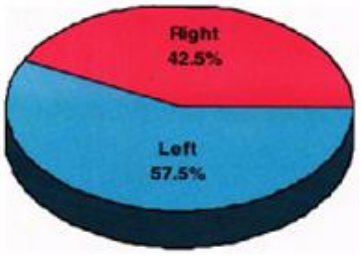

Fig. 1. Breast carcinoma - side of breast

Fig. 1 shows the percentage of patients with breast carcinoma that reveals that about 42.5% patients

fights against the disease. About 98.7% patients are female and very small percentage of patients are male (1.3%). The nuclear pleomorphism and mitotic counts were included on scoring the tumor grading as follows scoring, 3-5 points indicated the grade 1 (well differentiated). 6-7 and 8-9 points represented the grade 2 and 3 (moderately differentiated and poorly differentiated) respectively.

The prognostic parameter of 50 patients has been presented in Table 1. In addition Uniform small round cells with vesicular nuclei-Histologic grade is observed through H&Ex400 and presented in Fig. 2. The table reveals mild prognostics in lymphocyte infiltration. In the case of positive P53 patients, negligible percentage of severe lymphocyte infiltration is observed.

3.2 Clinical Profile

Thirty five patients reported to have dyspepsia alone and other thirty one patients had epigastria pain with dyspepsia. 12 reported to have nausea and vomiting with epigastria pain. The weight loss was reported by twenty two and epigastric pain was seemed to be common among them and its duration was six to twelve months. Dyspepsia was the most common feature for which gastric biopsies were taken. Antral biopsy was taken in 63 patients and 31 biopsies from antrum and corpus were taken respectively. Out of 72 chronic gastritis, 42 cases were H.pylori gastritis. Of this 32 H.pylori gastritis (76%) were antral gastritis and 8 cases(l4%) from corpus.2 cases from both corpus and antrum.

Table 1. Prognostic parameters of the 50 breast cancer cases on 15 +ve and 35 -ve p53 cases

Prognostic parameter	Number of Patients (n=50)	P53 negative (n=35)	P53 positive (n=15)	P value
(Margin nnfiltration by tumor cells)				
Absent	49 (98%)	34 (97.1%)	15 (100%)	1.000
Present	1 (2%)	1 (2.9%)	0 (0%)	
Lymphocyte infiltration				
Mild	35 (70%)	27 (69%)	8 (73%)	1.000
Moderate	12 (24%)	9 (23%)	9 (23%)	
Severe	3 (6%)	--	3 (8%)	

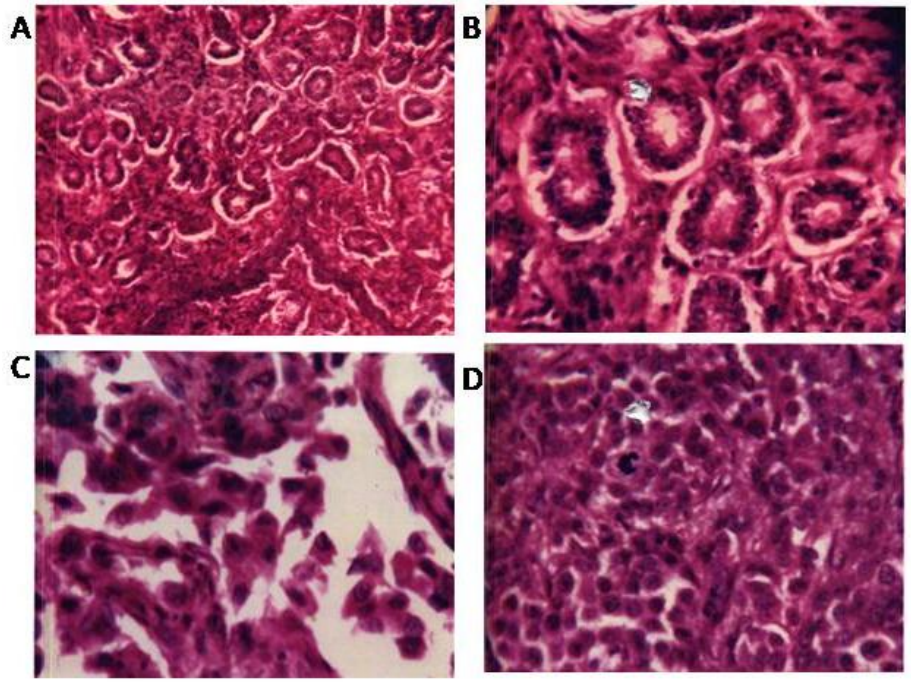

Fig. 2. A. Uniform small round cells with vesicular nuclei-Histologic grade I (H&Ex400). B. Moderate degree of tubule formation, with moderate increase in size of nuclei-Histologic grade II (H&E x400). C. Cells with prominent nucleoli and moderate increase in size- Histologic grade II (H&E x400). D. Cells with prominent nucleoli and increase in size- Histologic grade II (H&E x400)

Table 2. Histopathological examination with H&E Stain

Histopathological finding	Neutrophil activity	Intestinal metaplasia	Lymphoid hyperplasia	Atrophy	H. Pylori H&E/WSS
Normal-4	-	-	-	-	-
Chronic gastritis-72	56	16	27	14	37/42
Polyp-4	1	-	-	-	-
Malignancy-20	4	9	2	3	11/13
Total-100	61	25	29	17	48/55

4. CONCLUSION

In dyspepsia patients, the endoscopic gastric mucosal biopsies is common and H. pylori infection is the major reason behind it. Its chronic infection lead to the tumor development ndthe current study showed that the Warthin-Starry silver stain was very much useful in identifying the respective infections.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

ACKNOWLEDGEMENTS

The encouragement and support from Bharath University, Chennai is gratefully acknowledged. For provided the laboratory facilities to carry out the research work.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Valla JD. Peptic ulcer disease and related disorders. Principles of Internal Medicine. 2001;1:1653-1654.
2. Khokar N, Gill ML. Gastrointestinal injury from non-steroidal anti-inflammatory drugs. Rawal Medical Journal 2003;28:22-24.
3. Anderson J, Anderson JV, Baker LRI, Benjamin N, Black GM, Borroughs AK. Gastrointestinal disease. Clinical Medicine. 2002;1: 270-272.
4. Minhas KZ, Goraya F, Javid S, Shakoor A, Rizwan A, HashmiMT. Endoscopic and Histopathological evaluation of 306 Dyspepsic patients. Pakistan Journal of Gastroentrology. 2003;17:4-7.
5. Rubin C. Are there three types of Helicobacter pylori gastritis? Gastroenterology. 1991;112: 2108.
6. Bhattacharya B, Montgomery E. Non-neoplastic disorders of the stomach. Gastrointestinal and Liver Pathology. 2005; 1:66-125.
7. Dheer S, Levine MS, Redfern RO. Radiographically diagnosed antral gastritis: Findings in patients with and without Helicobacter pylori infection. Brazilian Journal of Radiology. 2002;75:805.
8. Appelman H. Gastritis: Terminology, etiology, and clinicopathological correlations-another biased view. Human Pathology. 1994; 25:1006.
9. Le HT, Murugesan A, Ramesh T, Yli-Harja O, Mani SK, Kandhavelu M. Molecular interaction of HIC, an agonist of P2Y1 receptor, and its role in prostate cancer apoptosis. International Journal of Biological Macromolecules. 2021;189:142-150.
10. Le HT, Rimpilainen T, Mani SK, Murugesan A, Yli-Harja O, Candeias NR, Kandhavelu M. Synthesis and preclinical validation of novel P2Y1 receptor ligands as a potent anti-prostate cancer agent. Scientific reports. 2019; 9:18938.
11. Meenakshi SK, Nagarajan M, Sundararaman M. Brine shrimp cytotoxicity was not warrant for teratogenicity: Comparative analysis of seaweed methanolic extracts collected from Tamil Nadu coastal region on brine shrimp and zebra fish embryos. Research & Reviews: A Journal of Life Sciences. 2018;8:24–32.
12. Meenakshi Sundarm K, Uma D, Rajakumar M. *In silico* Discovery of Seaweed Molecules against Matrixmet all oproteinase-26. Journal of Advanced Bioinformatics Applications and Research. 2015;6:52-61
13. Kim SW, Roh J, Park CS. Immunohistochemistry for pathologists: protocols, pitfalls, and tips. Journal of Pathology and Translational Medicine. 2016;50:411.
14. Carneiro A, Barbosa ÁR, Takemura LS, Kayano PP, Moran NK, Chen CK, Wroclawski ML, Lemos GC, Cunha IW, Obara MT,

Tobias-Machado M. The role of immunehistochemical analysis as a tool for the diagnosis, prognostic evaluation and treatment of prostate cancer: A systematic review of the literature. Frontiers in oncology. 2018;8:377.