



ROBINSON 'S CYTOLOGICAL GRADING ON ASPIRATES OF BREAST CARCINOMA: CORRELATION WITH MODIFIED SCARFF BLOOM RICHARDSON HISTOPATHOLOGICAL GRADING.

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ABSTRACT

Background: Breast cancer is one of the most common cancers in females. Cytological grading on aspirates of breast carcinomas is a useful tool for surgical maneuver and prognosis. **Aims and objectives:** 1) To study Robinson's cytological grading on preoperative FNAC smears in cases of breast carcinoma. 2) To correlate Robinson's cytological grading with modified Scarff Bloom Richardson histopathological grading. **Methods:** A retrospective study was done on 112 patients of breast carcinoma over the period of 5 years from 1st January 2011 to 31st December 2015 at a tertiary care centre. **Results:** Groups II and group III cases of breast carcinomas were correlated very well on cytological and histopathological grading. The sensitivity of cytological grading in the present study were 84.66%, 89% and 93.31 respectively. Specificity were 92.71%, 88.92% and 96.98% respectively i.e. maximum in grade III. The k value for present study showed 0.5172 i.e. substantial agreement. **Conclusion:** Cytological grading of breast carcinomas correlates well with histopathological grading and may well be useful as a prognostic marker. It is helpful in selecting the patients for modified radical mastectomy with axillary dissection and neoadjuvant chemotherapy.

KEYWORDS : Robinson's grading, breast carcinoma, Elston- ellis scarff – bloom richardson's histopathological grading

INTRODUCTION

Breast carcinoma (BR Ca) is one of the most common cancers in women worldwide, a leading cause of death among women, with more than 1,000,000 cases occurring annually. Among Indian females, it is second most common next to cervical carcinoma. Combination of clinical examination, imaging studies, and fine needle aspiration cytology can offer accurate diagnosis in 99% of cancer cases⁽¹⁾. A complete history, family history, clinical examination, tumour size, nodal status, metastasis, tumour type, radio imaging, immunohistochemistry analysis of oestrogen [ER] progesterone [PR] receptors, Her 2 status, DNA ploidy, cell proliferation markers along with histopathological grading is important in diagnostic evaluation of and prognosis in breast carcinomas⁽²⁾. The National Cancer Institute (NCI), Bethesda, sponsored conference had recommended that, tumour grading on preoperative fine needle aspiration cytology report should also be incorporated in the parameters for prognostication of the case⁽³⁾. In recent past, Robinson's Cytological Grading (RCG) for FNAC is widely used as preoperative evaluation in classifying various grades into Grade I to III of breast carcinoma. Histopathology is a gold standard in validating the diagnostic criteria and is accepted worldwide. Elston- Ellis modification of Scarff- Bloom Richardson (EESBR) histopathological grading it is widely used. It is based on architectural and cytological features and has been found to have good prognostic correlation. Nuclear grading on cytological specimen has been shown to correlate well with histopathological grading unlike other parameters such as tubule formation and mitosis. The grading of tumour before removal would help clinicians to decide on the appropriate neoadjuvant therapy as low grade tumours treated with tamoxifen while high grade call for preoperative chemotherapy. This is essentially true in developing countries where core needle biopsy still is not used as a standard practice to sample breast carcinoma cases. RCG and EESBR have been reported to have significant correlation between the cytological and the histological grades (4, 5), hence the same is adopted in the present study to evaluate the significance and practical application.

AIMS AND OBJECTIVES

- 1) To study Robinson's cytological grading on preoperative FNAC smears in cases of breast carcinoma.

- 2) To correlate Robinson's cytological grading with modified Scarff Bloom Richardson histopathological grading.

MATERIALS AND METHOD

A retrospective study was undertaken on 112 female patients of breast carcinomas over the period of 5 years from 1st January 2016 to 31st December 2015 at a tertiary care centre. Cytological evaluation and its comparison with histopathological diagnosis has been highlighted.

After detail history and clinical examination, consent from each and every patient was taken. FNAC was done by using 22 or 24 gauge needle and 10 ml syringe and slides were prepared. After drying Leishman Staining was done and a few cases Papanicolaou stain was also employed. After cytological observations according to the Robinson's grading the tumour were classified as grade I, II, III. Only the cases having six or more epithelial cell clusters (ECC) on cytology were subjected to grading as this is the minimum criteria for specimen adequacy.

Post operative gross specimen was examined thoroughly in the pathology department and representative areas sampled, tissue processing done, and the sections were stained with Hematoxylin and Eosin (H&E) stain. The diagnosis and histopathological slides as well as FNAC smears were reviewed independently and final conclusion arrived at.

Inclusion criteria

- All Patients presenting with breast carcinomas, attending OPD or admitted to tertiary care hospital.
- Informed consent taken from each patient.

Exclusion criteria

- In individuals where only FNAC had been done without histopathology.
- Neoadjuvant chemotherapy received cases were excluded.

RESULTS:

In the present study a total 112 cases of breast carcinoma were included. The age ranged from 26 to 74 years, with mean age was 46.5 year. Maximum number of patients belonged to the AE group of 60-69 years. Robinson's cytological grading is

based on dissociation of cells, nuclear size, cell uniformity, nucleoli, nuclear margins and nuclear chromatin (Table 1). In this series, all the FNA smears were categorized into score 1, 2, 3.

Table 1: Robinson's cytological grading

Features	Score 1	Score 2	Score 3
Dissociation	Cells in clusters	Single, with cell clusters	Mostly single cells
Nuclear size	1-2 x RBC	3-4 x RBC	5x RBC size
Cell uniformity	Monomorphic	Mildly pleomorphic	Highly pleomorphic
Nucleoli	Indistinct	Noticeable	Prominent
Nuclear margins	Smooth	Folds	Clefts/ Buds
Chromatin	Vesicular	Granular	Clumped and clear

Based on the above parameters it was observed that, 12 case were in grade I, 24 and 14 were in grade II and III respectively. All these cases correlated well with gold standard histopathological grade as per EESRB. A total score in the range of 6-11 was given grade I, 12-14 as grade II and 15-18 as grade III. Grade I- smears score in the range 6-11 . Grade II-smear scored in the range 12-1, and Grade III- smear scored in the range 15-18.

The surgical specimens were evaluated and histologically graded according to Elston's modification of Bloom Richardson system. Three parameters were considered. degree of tubulr formation, nuclear pleomorphism, and mitotic figures. Each parameter was given a score of either 1, 2 or 3. sections were stained by H&E stain and final score ranged between 3 and 9 which was divided in to 3 grades (I - III). For grade I , the score varied from 3 to 5. for grade II, the score was 6 to 7 and for grade III, the score was 8 to 9.

Table 2: Correlation of Robinson's cytological grading with Elston-Ellis modification of Scarff-Bloom Richardson (EESBR) histopathological grading

Robinsons cytological grading (RCG)	Histological grading (EESBR)			Number of cases (%)	Concordance rate (%)
	Grade I	Grade II	Grade III		
I	21	3	0	24 (21%)	87.50 %
II	4	65	4	73 (65%)	89.04 %
III	0	1	14	15 (19%)	85.71 %
Total	25	69	18	112 (100%)	89.95 %

Using Robinson's cytological grading system 24 cases (21.42%) belonged to grade I, while 73 (65.17%) and 15(13.39%) were in grade II and grade III respectively. As per Elston-Ellis modification of Scarff- Bloom Richardson histopathological grading post-operative histopathological grading concordant cases 21(16%) graded as I, 65 i.e. (36%) and 17 (24%) graded as II and III respectively. Agreement/ concordance was arrived by Kappa (k) measurement of agreement. In the present study concordance rate was 87.55%, 89.04% and 93.33% respectively with overall concordance of 89.95%. This study revealed that concordance of cases was more in grade II and maximum in grade III. The k value for present study showed 0.8172 i.e. substantial agreement

DISCUSSION

Cytological grading on aspirates is of great significance as it

is a cost-effective method to predict prognosis of breast carcinoma. Evaluation of cytological grade is quick, easy procedure which, correlates well with histopathological nuclear grade. The ability to predict the grade accurately on cytology smears would add to the diagnostic value of FNAC, without any additional morbidity or expense for the patients.

One of the reported study showed a statically significant association between cytologic and histologic grades (r=0.82; p<0.01) with sensitivity and specificity 100% and 93.95% respectively.^[7] In another series of cases studied also showed good correlation of cytology and histopathological grading. Another study conducted at tertiary care centre revealed cyto-histopathological correlation in i.e. 82.76 % (n=48) cases and they found cytological grading of infiltrating duct carcinoma as well as special verities of breast carcinoma correlates well with histopathological grading^[9].

We feel, that RCG grading should be included as routine practice in the FNAC reports. Some workers suggest that cytological prognostic grading should be evaluated as a semi-quantitative additional tool in initial workup as well as for continuous monitoring of therapy effect during treatment^[11] One may encounter limitation of FNAC in some situations like differentiation between intraductal and invasive tumour, as the diagnosis of intraductal carcinoma requires the careful observation of architecture and basement membrane integrity that can be assessed only on histopathological study^[11].

CONCLUSION

Robinson's cytological grading of breast carcinoma is a simple, quick and correlates well with histopathological grading in 90 % of cases.

Robinson's cytological grading could be the best way for early i.e. Preoperative evaluation of breast carcinoma as it is an additional tool for better management of the case.

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