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Original research article

Breast carcinoma: A correlative study between cytological and histological grading

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Abstract

Breast carcinoma is one of the most common cancers in women among the world. Early accurate diagnosis plays key role in treating patients. Cytological diagnosis and grading helps clinician to select appropriate treatment modalities for the patient. Our aim is to study the cytological grading on FNAC smears of breast carcinoma using Robinson grading and to compare the performance with Elston Ellis modification of Scarff Bloom Richardson histological grading and to know the concordance between these two grading systems. Out of 50 cases, both cytologically and histologically concordant cases in grade I are 7 cases (70%), grade II are 21 cases (81%) and grade III are 14 (100%) cases. Over all concordant cases are 42 (84%). Percentage of concordance between Robinsons cytological grading with NBR grading is good for grade III and II tumors. Hence inclusion of Robin son cytological grading in all FNAC reports of breast cancer is very useful to oncologist in avoiding over treatment of low-grade tumors.

Keywords: Breast carcinoma, concordance, cytology, grade, histopathology

Introduction

Breast carcinoma is the commonest cancer in the world, among women in urban India and 2nd most common in the rural India. It varies from 30 per 1lakh in urban areas to 5 per 1 lakh in rural areas [1]. With the exception of 5-10% breast cancers where the main risk factors are genetic predisposition, in the remaining 90% of sporadic breast cancers, the identified risk factors are reproductive, lifestyle, environmental factors [1, 2]. Triple diagnosis has brought a lot of changes in accurate diagnosis. Out of which FNAC plays a critical role for initial evaluation and early diagnosis of breast lumps [2, 3]. FNAC also provides necessary prognostic information in breast carcinoma, particularly for patients who may require neoadjuvant therapy [4, 5]. Cytological grading of breast carcinomas on FNAC provides relevant information on aggressiveness of tumor and it is also very useful in patients with locally advanced disease, older patients with chronic diseases. Histological grading of breast carcinoma using Nottingham method by ELSTON and ELLIS (NBR) is a widely accepted system and has been found to have prognostic correlations [5, 6].

Aims and Objectives

To study the cytological grading on FNAC smears of breast carcinoma using Robinson grading and to compare the performance with Elston Ellis modification of Scarff Bloom Richardson histological grading. To know the concordance between these two grading systems.

Materials and Methods

This is a retrospective study. Breast carcinomas reported from July 2017 to July 2018 in the department of pathology in our institute were included in the study. After standard FNAC procedure, smears were prepared, studied and graded according to Robinson's grading.

Robinson's cytological grading includes six parameters.

a) Cell dissociation (score 1 mostly clusters, score 2 mostly clusters and single cells, score 3 mostly single).
b) Cell uniformity (Score 1 monomorphic, score 2 mildly pleomorphic, score 3 pleomorphic).
c) Cell size (1-2 times RBC score 1, 2-4 times RBC score 2, >5 times RBC score 3).
d) Nuclear margin (score 1 smooth nuclear margin, score 2 irregular nuclear margins, score 3 nuclear margin showing clefts/buds).

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e) Nucleolus (score 1 indistinct, score 2 noticeable, score 3 prominent).
f) Chromatin (Score 1vesicular, score 2 granular, score 3 prominent) Scores between 6-11 considered as Grade I, Score 12-14 as grade II, Score 15-18 as grade III.

After grossing the mastectomy specimens as per standard protocols, tissues were routinely processed and stained then graded according to modified SCARFF BLOOM RICHARDSON grading. Histological grading of breast carcinoma using Nottingham method by ELSTON and ELLIS (NBR) is a widely accepted system and has been found to have prognostic correlations.
NBR score includes
a) Tumor tubule formation (> 75% of tumor is score 1, 10-75% of tumor score 2, < 10% of tumor score 3).
b) Mitotic count/10 HPF (0-9 is score 1, 10-19 is score 2, 20 or more score 3).
c) Nuclear pleomorphism (Small regular uniform cells score 1, moderate nuclear variation in size and shape is score 2, marked nuclear variation in size and shape score 3). Scores between 3-5 points is grade I, 6-7 is grade II, 8 - 9 points grade III.

Results

Table 1: Age distribution in decades

Age in yrs.	20-30	31-40	41-50	51-60	61-70	71-80	Total
No. of. patients	3 cases (6%)	7 cases (14%)	24 cases (48%)	11 cases (22%)	3 cases (6%)	2 cases (4%)	50 (100%)

Table 2: Anatomical distribution

Side	Number of cases	Percentage %
Right	27	54%
Left	23	46%

Table 3: Robinson's grading-Distribution of cases

Grade	Number of Cases	Percentage (%)
I	10	21%
II	26	52%
III	14	27%
Total	50	100%

Most of the cases are in Grade II in cytological grading.

Table 4: NBR Score-Distribution of cases

Grade	Number of Cases	Percentage
I	11	22%
II	24	48%
III	15	30%
Total	50	100%

Most of cases are in Garde II histological grading.

Table 5: Concordance between two grading systems

Cytological Grading	Histological Grading			
	Grade I	Grade II	Grade III	Total
Grade I	7	3	0	10
Grade II	4	21	1	26
Grade III	0	0	14	14
Total	11	24	15	50

Table 6: Comparison of concordance cases between the cytological and histological grades

Grade	Number of Cases in Each CG	Number of Concordant Cases in Cg & Hg	Concordance Rate (%)
I	10	7	70%
II	26	21	81%
III	14	14	100%
Total	50	42	84 (Over all)

Cyto-Histo Correlation, out of these 50 cases, both cytologically and histologically concordant cases in grade I are 7 cases (70%), grade II are 21 cases (81%) and grade III are 14 (100%) cases. Over all

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concordant cases are 42 (84%) out of 50 cases [Fig 1, Fig 2, Fig 3].

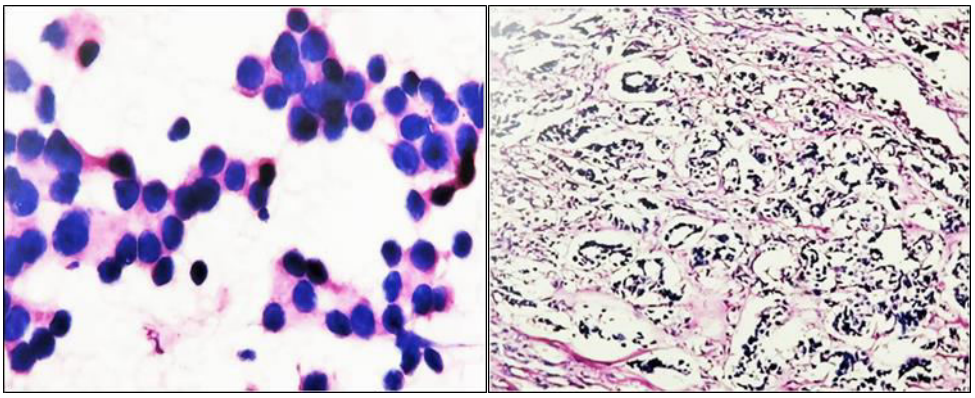

Fig 1: Grade I cytological (400X) and histological microscopic pictures (100X)

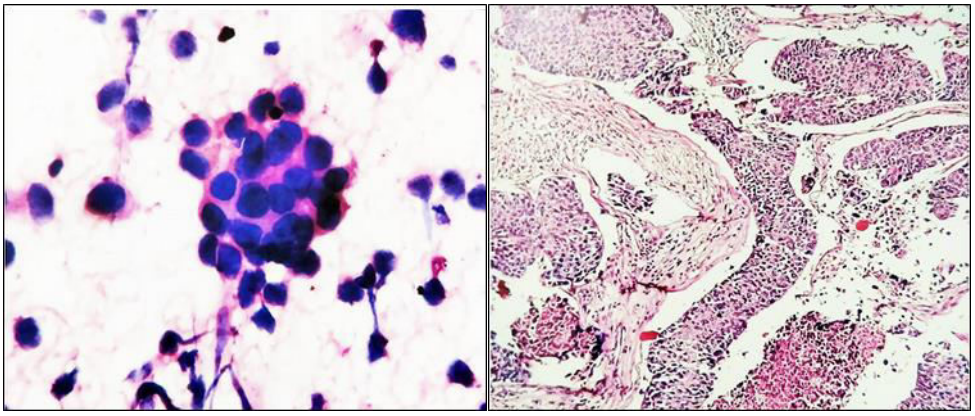

Fig 2: Grade II cytological (400X) and histological microscopic pictures (100X)

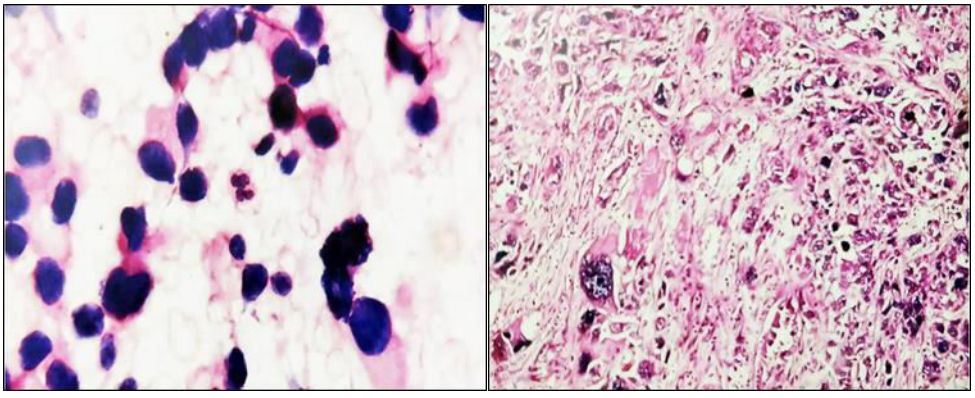

Fig 3: Grade III cytological (400X) and histological microscopic pictures (100X)

Discussion

FNAC results are graded according to Robinson's grading, in our present study out of 50 cases, most cases were GRADE II 26(52%) followed by grade III 14 (27%) and 10 cases (21%) were grade I [1, 4, 5]. Under Robinsons grading, our study correlated well with Chandanwale SS *et al*. and Krishnakanth GVRN *et al*. in the view of more cases in Grade II (52%) followed by Grade III (27%) and Grade I (21%) [6, 7, 8].

NBR grading- In present study of 50 cases, most of cases were grade II followed by grade III and grade I. Under NBR grading, our study was in concordance with Chandanwale SS *et al*. and chalise S *et al*. in the view of more cases in Grade II(54%) followed by Grade III(32%) and Grade I (14%) [7, 8, 9, 10].

In the comparison of Robinson's grading with NBR grading, the present study correlated well with Ahmed I *et al*. and Das *et al*. in the number of Grade II cases in both the systems [1, 4, 6, 7].

Comparison of grade wise and overall concordance rates. In the comparison of grade wise and overall concordance our study was in concordance with the study of Krishnakanth GVRN *et al*. in the view of more concordance rate % for Grade III followed by Grade II then Grade I cases [4, 6, 7].

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Table 10: Showing comparison of concordance rate of present study with other studies

Studies	Concordance (%)			Overall Concordance (%)
	Grade I	Grade II	Grade III	
Krishnakanth GVRN *et al*.	66	85	100	75
Khan N *et al*.	92	83	92	89
Chalise *et al*.	45	80	72	83
Present Study	70	81	100	84

Conclusion

Percentage of concordance between Robinson's cytological grading with NBR grading is very high for grade III tumours and percentage of concordance is reasonable for grade II followed by grade I tumours. Thus, it is suggested that a conscious efforts should be made to include Robin son's cytological grading in all FNAC reports of breast cancer so as to guide surgeon regarding the judicious use of neo adjuvant therapy and hence avoiding the over treatment of low grade tumors.

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