



COMPARISON OF ROBINSON'S CYTOLOGICAL GRADING WITH ELSTON'S MODIFIED BLOOM RICHARDSON'S HISTOLOGICAL GRADING IN BREAST CARCINOMA: A TWO YEAR STUDY IN A TERTIARY CARE HOSPITAL OF NORTH EAST INDIA.

Dr Deep Jyoti Kalita*	MD (Pathology), Resident Pathologist, Department of Pathology, Gauhati Medical College & Hospital, Guwahati, Assam. *Corresponding Author
Dr Barnali Das	MD (Pathology), Associate Professor, Department Of Pathology, Gauhati Medical College & Hospital, Guwahati, Assam.
Dr Tarali Pathak	General Duty Medical Officer, Cancer Hospital, Guahati Medical College & Hospital
Dr Samim Sultana Hoque	General Duty Medical Officer, Cancer Hospital, Gauhati Medical College & Hospital, Guwahati, Assam.
Dr Ranjita Sarma	Demonstrator, Tezpur Medical College & hospital, Tezpur.

ABSTRACT **INTRODUCTION:** Cytological grading has an important role in terms of therapy and prognosis of carcinoma breast. However no uniform consensus have been made regarding reporting and acceptability of cytological gradings. **AIM:** This study was done to compare the widely known Robinson's cytological grading with Elston's modified Bloom -Richardson's method. **MATERIALS AND METHODS:** We present a series of 72 cases who were clinically as well as radiologically suspected of having carcinoma breast. The study period was between July 2014 to June 2016. Robinson's nuclear grading was ascertained for all cases. Haematoxylin -eosin stained sections were examined for confirmation of cytological findings, modified R&B score was obtained. Concordance rate between both the grading system was determined. **RESULTS :** The concordance rate between grade I tumours in cytology and histology was 73.33%, while for grade II tumours it was 72.22%. Grade III tumours showed a higher concordance rate of 81.25%. Overall concordance rate was 76.9%. **CONCLUSION:** Precise cytological grading can guide the surgeon in determining the proper treatment and hence prevent unnecessary mastectomies as well as many deaths in future.

KEYWORDS : Carcinoma breast, Concordance, Tumours.

INTRODUCTION

Carcinoma breast, one of the commonest cancers in women worldwide, comprises a heterogeneous group of patients. Many factors other than clinical stage; like tumor type, histological grading, hormone receptor status, DNA ploidy, cell proliferation markers and expression of different oncogenes determine prognosis in a given patient¹.

Histological grading of breast carcinoma using Nottingham method described by Elston and Ellis is a widely accepted tumor grading system and has been found to have good prognostic correlations². In recent years fine needle aspiration cytology is increasingly being used for preoperative diagnosis of breast cancer. Attempts have been made to determine various prognostic parameters on FNA material to determine the best therapy in a given case.

The National Cancer Institute (NCI), Bethesda sponsored conference on the uniform approach to breast fine needle aspiration biopsy had also recommended that tumor grading on FNA material should be incorporated in FNA reports for prognostication³. Of the different cytologic grading methods corresponding to Elston and Ellis's histologic grading, the method described by Robinson et al was found to be useful in grading breast carcinoma in FNA⁴.

Considering these facts, this study was done to compare the precision of widely known Robinson's cytological grading with histological grading of Elston's modified Bloom -Richardson's method (gold standard).

MATERIALS AND METHODS:

72 patients who were clinically as well as radiologically suspected of having carcinoma breast during the period of July 2014 to June 2016 were taken as study subjects. They were sent for cytological examination at the department of pathology, GMCH. Aspiration was done using 20G needle and smears were stained with May- Grunwald-Giemsa and Papanicolau stains. These cases were subsequently followed for histopathological examination. Haematoxylin -eosin stained sections were examined for confirmation of cytological findings.

Cytological grading was done using the grading systems described by Robinson et al. In this system, six different cytological parameters

namely cell dissociation, cell size, cell uniformity, nucleolus, nuclear margin and nuclear chromatin were used to grade the tumours. A score of 1-3 was given to each of these parameters and the tumour was graded by adding up the scores. Cancers that were scored in the range of 6-11 were graded I, score of 12-14 were graded II, and grade III was given for a score ranging from 15-18.

Histological grading was done using Nottingham method described by Elston and Ellis.

Statistical methods: Statistical analysis was done in Graph pad prism software 7. Comparison between cytological grading and histological grading was done using Kappa coefficient statistics.

RESULT

Out of 72 cases which were subjected to histopathological examination on the basis of cytological and radiological features, 65 cases came out to be Carcinoma breast. Remaining 7 cases were either Proliferative breast disease with atypia or Ductal carcinoma in situ.

When graded by Robinson's cytological grading, 15 cases (23.07%) were graded as grade I, while 18 cases (27.69%) belonged to grade II category. Maximum number of cases were graded as grade III tumours (49.23%). When ascertained a score between 1-3, 38.46% cases were given a score of 3 in terms of cell dissociation. 46.15% cases were given a score of 3 in terms of cell size. 55.38% cases were given a score of 3 in terms of cell uniformity, nucleoli characteristics and nuclear margin features. 56.92% cases showed a score of 3 when nuclear chromatin features were taken into account.

While in histological grading of Bloom Richardson, 12 cases (18.4%) were graded as grade I tumour, 22 cases (33.84%) belonged to grade II category. Maximum number of cases (47.69%) belonged to grade III category, i.e. poorly differentiated tumours.

Comparison of Robinson's cytological grading with histological grading: Robinson's cytological grading showed an absolute concordance with histological grading in 50 (76.9%) of the 65 patients. Of the 15 cases showing discordance, only 1 case showed a discordance of two grades. There was one grade difference in the rest 14 cases. Statistical analysis showed a moderate strength of association between cytological and histological gradings in all three grades of tumour.

DISCUSSION:

The advantages of FNAC in the diagnosis of breast carcinoma is well known, however grading of carcinoma breast on FNAC is underestimated.

In the present study, distribution of cases according to the method described by Robinson et al showed 23.07% cases graded as cytological grade I, 27.69% as grade II, and 49.23% as grade III. Pandit and Parikh graded 75 breast carcinomas by Robinson's method with 34.7% in grades I and grade II, and 30.6% in grade III. While Kusum Verma et al graded 28.8% cases as grade I, 46.2% as grade II and 25% as grade III. Majority of the cases fell into grade III in our study. It may be due late presentation of patients at health care institution or ours being a tertiary care institute, catering all referred cases from North east India may selectively show higher proportion of poorly differentiated Grade III breast carcinoma cases. 4

The overall concordance of Robinson's grading with histological grading in the present study is 76.9% and this is comparable with other published data. In the present study, the concordance of Robinson's grading with histological grading was highest in grade III (81.25%) tumours. Sinha et al also reported a similar finding like ours.

Kappa value for measuring the strength of agreement was found to be moderate in all grades. Similar findings were reported by other studies like of Neelam Sood et al, Pandit and Parekh et al etc.

Discordant cytological grading in 15 cases (23.07%) is comparable with the findings of Verma K et al from AIIMS, Delhi. Similar results were seen in the study of Pandit and Parekh et al. However the discordance rate was higher in study done by Robinson et al (39.5%) Among the discordant cytological grading cases, only 1 case (1.53%) had two grade difference than histological grade. It was lesser than that found in the study of Verma K et al done at AIIMS, Delhi. Though in the study of Robinson et al the rate of discordance was higher than other studies, however majority of the cases had a one grade discordance with histological grade.

CONCLUSION

In resource-poor settings, diagnosis of breast carcinoma is still being made on FNAC. It is cheaper, easier, less invasive and can sample different areas of the lesion compared with core needle biopsy. Cytological grading of infiltrating duct carcinoma (NOS) as well as other special types correlates well with their histological gradings. Cytological grading using FNAC permits determination of the aggressiveness of breast carcinoma. It is a useful parameter to take into consideration when selecting neoadjuvant therapy for breast carcinoma. 6, 7.

If interpreted carefully FNAC smears can convey information on most of the histological features. Hence in developing countries, the focus should be extracting the maximum information from cytological smears, so that a more precise 'surgical pathology' type diagnosis can be given, instead of merely reporting as benign or malignant. 8.

Having a high concordance rate with histological grade, we recommend that all FNA reports should be signed out with cytological grades, especially in low resource settings where core biopsy is not performed for diagnosis, and the treatment is based on cytology report itself. 9

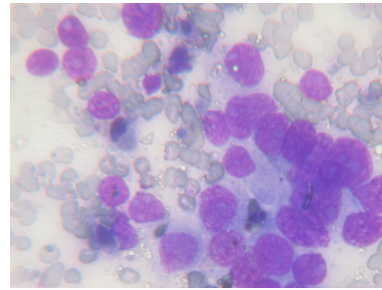
Table 1: Comparison of cytological and histological grades in 65/72 cases.

CYTOLOGICAL GRADE	HISTOLOGICAL GRADE			
	I	II	III	
I	11	3	1	15
II	1	13	4	18
III	0	6	26	32
TOTAL	12	22	31	65

Table 2: Agreement between cytological and histological grading by statistical analysis (kappa coefficient)

GRADE	KAPPA VALUE (95% CI)	STANDARD ERROR	STRENGTH OF ERROR
I	0.414	0.118	MODERATE
II	0.478	0.105	MODERATE
III	0.428	0.076	MODERATE

Fig 1: Cytologically Grade III Tumour Showing Cells with Pleomorphic Nuclei, prominent and Multiple Nucleoli with Membrane Irregularity. Mgg 40x10



REFERENCES

1. Fitzgibbons PL, Page DL, Weaver D, Thor AD, Allred DC, Clark GM, et al. Prognostic factors in breast cancer. College of American Pathologists Consensus Statement 1999. Arch Pathol Lab Med 2000; 124: 966-78.
2. Pandit AA, Parekh HJ. Cytologic grading of breast carcinoma; comparison of four grading systems. J Cytol 2000; 17: 39-44.
3. The uniform approach to breast fine needle aspiration biopsy. A synopsis. Acta Cytol 1996; 40: 1120-6.
4. Elston CW, Ellis IO. Pathological prognostic factors in breast cancer. I. The value of histological grade in breast cancer: experience from a large study with long-term follow-up. Histopathology 1991; 19: 403-10.
5. Steinberg JL, Trudeau ME, Ryder DE, Fishell E, Chapman JA, McCreedy DR, et al. Combined fine needle aspiration, physical examination and mammography in the diagnosis of palpable breast masses: Their relation to outcome for women with primary breast cancer. Can J Surg 1996; 39: 302-11.
6. Dabbs D. Role of nuclear grading of breast carcinomas in fine-needle aspiration specimens. Acta Cytol 1993; 37: 361-366.
7. Zoppi JA, Pellicer EM, Sundblad AS. Cytohistologic correlation of nuclear grade in breast carcinoma. Acta Cytol 1997; 41: 701-704.
8. National Institutes of Health Consensus Development Panel. National Institutes of Health Consensus Development Conference Statement: Adjuvant therapy for breast cancer, November 13, 2000. J Natl Cancer Inst Monogr 2001; 30: 5-15.
9. Robinson IA, McKee G, Nicholson A, D'Arcy J, Jackson PA, Cook MG, et al. Prognostic value of cytological grading of fine needle aspirates from breast carcinomas. Lancet 1994; 343: 947-9.