

A single pathological grading system for breast carcinoma should be adopted in Bangladesh

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Abstract

Histological grading of breast cancer is related to the prognosis and management of patients. In addition multivariate analysis confirmed that only histological score was an independent prognostic factor. These results suggested that assessment of histological heterogeneity of invasive ductal carcinoma could serve as independent potent prognostic factor for invasive duct cell carcinoma of the breast, and this method might be useful for postoperative adjuvant chemotherapy. There are different pathological grading system. Of them multivariate analysis needs menopausal status, tumour size and node. Taniguchi grading depends on seven parameter like necrosis, cellular size, nuclear and cytoplasmic ratio, chromatin granularity, density of chromatin, nuclear pleomorphism & nucleoli. Black's grading is classified into low grade and high grade. These are complicated, not reliable and difficult possible in our country. Scraff Bloom Richardson (SBR) grading system need ductoglandular formation, nuclear characteristics of pleomorphism and mitosis. Histological scoring system is based on tubular differentiation, pleomorphism & mitosis by Nottingham modification of Scraff Bloom Richardson (NSBR) grading system. Modified SBR needs mean shortest nuclear axis, mitotic activity index and tubular differentiation. It is more labourious and time consuming. This study was undertaken with the aim to determine the grade of duct cell carcinoma by NSBR histological grade which can easily be performed in Bangladesh. On histological grading 33 cases were grade-I, 39 cases were grade-II and 8 cases were grade-III. In the current material the NSBR grading system very efficiently predicted the prognosis of breast cancer by dividing the patients into favourable (grade-1), intermediate (grade-II) & unfavourable (grade-III) outcome ($P < 0.0001$). NSBR is simple, reproducible, can be done on all tissue available for histopathological examination. It is more effective, used more widely and also be performed by all pathologist and can also be possible in Bangladesh. In our country there is lack of uniformity in histopathology reporting of breast cancer. We recommend the adoption of a single, objective grading system, as the Nottingham method of SBR by all clinicians in Bangladesh.

Introduction

Breast carcinoma is one of the most common malignant tumour and a leading cause of death in women¹. One in nine women in the United States develops breast cancer in her life time, one third of these women succumb to death². Breast cancer was also reported as second most common cancer in women, in Bangladesh according to hospital based data³. The actual prevalence of the condition is not known in Bangladesh.

Histological grading of breast cancer is widely practiced as it reflect high correlation with survival and helpful for choosing the appropriate therapy¹. Knowledge of the tumour grade would avoid under treatment of high grade carcinoma and over

treatment of low grade carcinoma³. Grading is important for predicting the survival rate and mode of treatment. More than 80% of women with grade-I tumour survive 16 years whereas <60% of women with grade-II & grade-III tumour survive for same period³. The histological grade and mitotic activity index (MAI) are important prognostic indices⁴. The grading system showed a high correlation with survival, was shown in several studies. Histological grading of breast carcinoma has become a routine practice in many centers world wide. It is to be realized that neoadjuvant therapy, preoperative chemotherapy and radiotherapy are becoming increasingly popular mode of treatment for high-grade breast carcinoma, while conservative therapy is recommended in low-grade breast carcinoma⁵.

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The grading system showed a high correlation with survival, was shown in several studies². For the effective management of breast cancer the recognition of aggressiveness of the disease is necessary. Optimal treatment must be aimed at eradication of the cancer with avoidance of unnecessary morbidity. In recent years, more treatment options have become available for breast cancer, which depends on various prognostic indicators⁶. Histologic grade is an important prognostic indicator in the overall and metastasis free survival for both local and regionalized breast cancer and is helpful for choosing the appropriate therapy⁷. A variety of grading systems have been suggested, the SBR grading is among the most widely used⁶ and the clinician can plan the mode of treatment. Also it can prevent excess morbidity associated with over treatment. The assignment of a histological grade of breast carcinoma has therefore been recommended in all surgical pathology reports.

Since histologic grading for breast carcinoma was first reported 1925⁵. There are different pathological grading system are in use, some consider ductoglandular differentiation or tumor secretory state, some score only nuclear and nucleolar characteristics, and others use both duct formation and nuclear abnormalities⁹. Multivariant analysis needs menopausal status, tumour size and node. Morphometrical grading system need mean shortest nuclear axis, mitotic activity index, tubular differentiation. It is more labourious and time consuming⁶.

Scraff Bloom Richardson grading system on biopsy specimens is in use since 1957, WHO 1981⁶. The scarf-Bloom-Richardson (SBR) grade, that evaluated ductoglandular formation and nuclear characteristics of pleomorphism and mitosis, has been the most frequently used grading scheme in Europe¹⁰. It has been used systematically since 1970 at the anticancer Center Rene Hu-guenin. Nottingham modification of SBR system is used since 1991, based on tubule formation, cellular pleomorphism & mitotic rate. Nottingham method (NSBR) being included in the guidelines drawn up by the Royal College of Pathologists working group in the UK⁴, and in those of the Australian cancer network working party⁵. In modified SBR grading system mitotic index is used which needs assessment of cell volume. At present facilities for assessing cell volume is not possible in Bangladesh. So we want to introduce, simple widely excepted and good prognostic value of NSBR histological grading system.

Black's 1993 grading system is classified into lowgrade and high grade. Howell 1994 reveals a grading of well differentiated, moderately differentiated and poorly differentiated. Taniguchi grading 2000 depends on seven parameter like necrosis, cellular size, nuclear and cytoplasmic ratio, chromatin granularity, density of chromatin, nuclear pleomorphism & nucleoli. These are complicated, not reliable, needs good stain and expert pathologist. So these are not possible in our country. Those has not gained wide acceptance world wide^{8,9}.

As the Nottingham system is widely regarded as the most objective of grading systems, the aim of our study was to determine if the three tiers of this system correlated with those of the other grading systems used in Bangladesh. Histologic grading has been criticized because its reproducibility has been perceived to be poor, due in part to subjective evaluation. Actually, varying degrees of reliability have been shown in comparative studies^{4,6}. However, pathologists who have worked together on the same methodology of this NSBR grading have shown that the system has excellent reproducibility^{7,9}. As assessment is based on nuclear grade which is a key prognostic factor. So we have used Nottingham Scraff Bloom Richardson (NSBR) histological grading system.

In recent years a more objective and precise Nottingham modification of the Bloom and Richardson system was been formulated³. This method has been widely accepted in Britain³ and Australia⁵, and is also used in the selection of appropriate therapy^{3,6}. NSBR is simple, reproducible, can done on all tissue available for histopathological examination. It is more effective, used more widely and can performed by all pathologist. It is also applicable for Bangladesh. In Bangladesh there is lack of uniformity in histopathology reporting of breast cancer. We recommend the adoption of a single, objective grading system such as the Nottingham method by all clinicians in Bangladesh.

Materials and Methods

This study was carried out in the Department of Pathology, Bangabandhu Sheikh Mujib Medical University (BSMMU), during the period from August 2004 to June 2005.

The study was based on 80 patients of duct cell carcinoma who were initially diagnosed by FNAC and subsequently confirmed by histology.

Histological slides were prepared routinely from paraffin sections and stained by haematoxyline and eosin method.

Histological grading was done by Nottingham modification of scraff Bloom Richardson (NSBR) grading system. NSBR grading system criteria and described by Doussal, Hulin, Freedman^{2,7} were followed.

Table-1

Shows Nottingham modification of the Scraff Bloom Richardson grading system.

Score		1	2	3
1	Tubuleformation	>75%	10-75%	<10%
2	Pleomorphism variation	Minimal variation	Moderate variation	Marked
3	Mitosis X10	0-9	10-19	>20
	Mitosis X 40	0-1	2	>2

Gr-I=score 3-5,Gr-II=score 6-7,Gr-III=score8-9

Results

A total of 80 (eighty) cases with mean age of 44 years were studied. All the selected patient were female. After operation a final histologic dignosis was obtained and graded by Nottingham Scraff Bloom Richardsons grading system.

Histopathological grading showed 33 (41%) cases were grade - I, 39 (48.8%) cases were grade - II and 8 (10%) cases were grade -III.

Table-2

Shows Distribution of study patients by histological scoring (Nottingham Scraff Bloom Richardson scoring)

Parameters		No of cases	Percentage(%)
Tubule formation	>75%	10	12.5
	10-75%	47	38.8
	< 10%	23	28.8
Pleomorphism	Mild	13	16.3
	Moderate	55	68.8
	Severe	12	15
Motosis	-1/40	38	47.4
	H.P.F		
	2/40	20	25
	H.P.F		
	>2/40	22	27.5
	H.P.F	38	

Discussion

Breast cancer is the second common cause of cancer death in women of our country.³ Treatment of breast cancer depends on a number of parameters known as pathological and biological prognostic markers. Knowledge of the tumour grade would avoid under treatment of high grade carcinomas and over treatment of low grade carcinoms.

Histologic grade is an important & independent prognostic factor. In addition, histologic grade also be useful in predicting response to chemotherapy. Therefore assignment of a histologic grade to all breast cancers, has been recommended as the standard in all surgical pathology reports.⁵ The most reliable method for the most widely used histological grading of Nottingham modification of scraff Bloom Richardson's grading system. ⁸ The importance of histologic grading of breast carcinoma is now widely accepted, with the Nottingham method being included in the guidelines drawn up by the Royal College of Pathologists working proup in the UK⁴, and in those of the Australian cancer network working party⁵.

Computer based morphometric grading was studied by kronqvist et al 2002 based mainly on nuclear character and mitosis. The this is not possible in Bangladesh. The most accepted histologic grading syetem is Scraff Bloom Richardson's grading system described by Doussal et al, 1989, Robinson's et al 1994, moroz et al 1997and Das et al 2003. Modified SBR needs mean shortest nuclear axis, mitotic activity index, tubular differentiation. It is more labourious and time consuming and need cell volume. The NSBR grading are accurate, reproducible and correlate closely with subjective assessment. This study concluded that grading of duct cell carcinoma is possible and can be done easily in every hospital. It is useful not only from the pathologic point of view but also for its clinical implications of tumor biologic behavior and assessing the tumour aggressiveness. There are abundant informations which confirm that grading of breast carcinoma can predict the prognosis of breast cancer ⁸ When comparing the different methods to evaluate the prognosis of breast cancer histological grading has been found to exceed that of hormone receptor status, DNA content, C-erbB-2, and p 53 expression⁶. Standardized application of the grading system had led to still higher accuracy in predicting the outcome of breast cancer. Cancer grading may exert an influence on the choice of treatment. The histological grading of breast carcinoma has become

routine in many centers worldwide.

80 patients with duct cell carcinoma which were initially diagnosed by histological examination and subsequently grading by (NSBR) grading systems. On histological grading 33 (41.3%) were grade-I, 39 (48.8%) were grade-II and 8 (10%) were grade -III.

The scores obtained in each group were comparable with other studies and the diagnostic accuracy of the present series correlates well with other series (Table-3).

Figar-1, 2, 3

Shows histopathological grading I, II & III.



Fig-1 Histopathological grade-I



Fig-2 Histopathological grade-II



Fig-3 Histopathological grade-III

Tabel-3

Comparison of evaluation of gading of the present series with the other series:

Authors	No of cases	Grade-I	Grade-II	Grade-III
Daussal et al,1989	1062	11%	54%	34%
Robinsons et al,2994	281	34%	44%	22%
Taniguchi et al, 2000	104	31.7%	37.5%	31.9%
Present series	80	41.3%	48.8%	10%

This indicates a high degree of reproducibility, similar to that reported by others. We recommend the adoption of a uniform, simple, reproducible, and widely accepted system such as the Nottingham modification of the Scarff Bloom Richardson grading system by all pathologists, oncologists and surgeons in Bangladesh.

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