Background: Carcinoma of the breast is a truly complex disease with a large intratumoral heterogeneity, leading to markedly variable clinical course and response to treatment modalities. Prognosis and management of breast cancer are influenced by variables such as stage, grade, hormone receptor status of estrogen (ER), progesterone (PR) and Human epidermal growth factor receptor-2 (HER2/neu) over expression.

Aims and Objectives: To highlight the histomorphological spectrum of breast carcinomas and their ER, PR, HER2NEU status. And also to find out correlation between their histological grade and hormone status.

Materials and Methods - 115 breast carcinomas were clinicopathologically and immunohistochemically analyzed in which assessment of HER-2/neu, ER, PR had been performed prospectively. Statistical analysis was then used to correlate the above observation.

Conclusion: This study highlights the importance of histopathology and immunohistochemistry in breast cancers not only in diagnosing the lesion but also in predicting the prognosis and target therapy.

KEYWORDS
Breast Cancer variants, Grade, ER, PR and Her 2 neu, IHC.

INTRODUCTION
Invasive breast cancer is the most common carcinoma in women. It accounts for 22% of all female cancers. Invasive breast carcinoma is a group of malignant epithelial tumors of the breast characterized by invasion of adjacent tissues and a marked tendency to metastasize to distant sites, believed to be derived from the mammary parenchymal epithelium, particularly cells of the terminal duct lobular unit (TDLU).

Breast carcinomas exhibit a wide range of morphological phenotypes and the histopathological types have particular prognostic or clinical characteristics.

Hormone receptor studies such as estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor-2 (HER2/neu) are routinely done in breast carcinoma now. It not only helps in the prognosis of the tumor but also helps in deciding its treatment. The goal of doing this receptor status is to provide right treatment to the right patient.

The objectives of our study are to evaluate ER, PR, HER2 NEU expression in different histological types of breast cancers with special emphasis on atypical breast carcinomas in our tertiary referral institution in Eastern India and whether there is any association between hormonal status and histological grade of the tumor.

Many studies have demonstrated a significant association between histological grade and survival in invasive breast carcinoma. It is now recognized as a powerful prognostic factor and should be included as a component of the minimum data set for histological reporting of breast cancer.

METHOD
This prospective study was done in the Pathology department of N.R.S. Medical College Hospital, Kolkata, West Bengal. Total 115 cases were studied in one year (January 2018– April 2019). Among them 60 cases obtained from modified radical mastectomy, 25 cases from simple mastectomy, 10 cases from lumpectomy specimens and 15 cases from trucut biopsy. Metastases from other sites have been excluded. All samples were subjected for routine histological examination, stained with Hematoxylin & Eosin stain and immunohistochemistry done with ER, PR, HER2NEU receptor markers.

ER, PR positivity was interpreted by Allred scoring system and HER2/neu positivity was interpreted and reported using ASCO 2007 guidelines (American Society of Cancer Oncology) which takes into account the cytoplasmic membrane staining and the proportion of immune positive tumour cells in comparison to positive controls. Assessment of histological grade was done by Modified Bloom and Richardson grading system.

RESULTS
In this study, a total of 115 cases were studied with ages ranging from 21 to 79 yrs. Among them 43% cases appeared in the age group of 41-50 yrs. Figure 1

The commonest histological pattern noted was invasive breast carcinoma of no special type (90 cases), followed by 11 cases of invasive lobular carcinoma and 5 cases of medullary carcinomas and 5 cases of mucinous carcinomas and 1 each for metaplasic carcinoma, invasive papillary carcinoma, tubular carcinoma and Paget’s disease with invasive ductal carcinoma component. Figure 2

Among invasive breast carcinoma, no special type (IDC-NST), we got 2 cases of IDC with apocrine changes and 2 IDC-NST with neuroendocrine features, and 1 solid papillary carcinoma with invasive ductal carcinoma component. Figure 1

Figure 1

Figure 2: different types of breast carcinomas

Number of cases

Frequency

Number of cases

Frequency distribution Distribution of cases according to Age groups(in years)
In this study, majority of breast carcinoma were grade 2 (49.3%) followed by grade 3 (38.3%) and grade 1 (13.9%) which were in concordance with the studies done by Azizun-Nisa et al and Ambroise et al; and Greeshma Ann George et al.

It has been well established that endocrine manipulation is the cornerstone of therapy for hormone receptor-positive tumors; anti-HER2 agents combined with chemotherapy or endocrine therapy are the standard treatment for tumors overexpressing HER2. Chemotherapy represents the only approach for the treatment of triple-negative breast cancers. If a patient's tumor expresses ER and/or PR, we can predict that this patient will positively benefit from endocrine therapy such as tamoxifen. The overexpression of the oncoprotein HER2/neu in a patient's breast cancer is an example of both a prognostic and predictive biomarker. HER2/neu expression is associated with poor prognosis (high risk of recurrence; however, it also predicts that a patient will more likely benefit from anthracycline and taxane-based chemotherapies and therapies that target HER2/neu (trastuzumab), but not to endocrine-based therapies. In the present study good correlation was found between ER/PR hormone receptor status and grade of tumor. 80% of all the ER/PR positive cases were of grade 1 and grade 2 breast cancers and 75% of the triple negative cases were grade 3 breast cancers. This was in concordance with studies done by Azizzun-Nisa et al and Geethamala K et al. Immunohistochemistry revealed 30.43% ER/PR positive, 19.1% HER2/neu positive (ER/PR negative), 28.7% Triple positive and 9.5% Triple positive and HER2/neu equivocal tumors. These results were in concordance with the studies done by Aaddedo et al and Sharif et al and were in discordance with a study done by Suvanchala et al, which had higher triple negative tumours (42.19%). In the present study good correlation was found between ER/PR hormone receptor status and grade of tumors. The limitation of the present study was the absence of correlation with Fluorescent in situ Hybridization (FISH) studies in Her2/neu equivocal cases.

CONCLUSION
Breast carcinoma is the most common malignant tumor in women, and it is the leading cause of mortality worldwide annually. Breast cancers are classified according to the histological features or molecular characteristics of the tumor. Each of them influences the outcome and response to the treatment. Nowadays, in our daily clinical pathology practice, the clinical value of assigning invasive breast cancers beyond routine histologic type, histologic grade, and ER/PR/HER2 status has not been established. In our study, most of the grade 1 and grade 2 tumours were ER/PR positive and majority of grade 3 tumours were triple negative which exemplifies the fact that higher the histological grade, lower is the hormone receptor expression. Assessment of hormone receptors for clinical management of breast cancer patients is strongly advocated to provide prognostic information and best therapeutic options. Histologic grading highly correlates with the survival rate and the receptor status predicts the response to hormonal therapy.

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