MIB-1 [21.6%], ER [58.8%], and PGR [54.4%]), expressed as median values, are reported in Figure 1. There was a significant relationship between (1) size and both age (R = 0.16, p = 0.005) and ER (R = −0.15, p = 0.011), (2) CEA and CA 15−3 (R = 0.19, p < 0.001), (3) PGR and ER (R = 0.52, p < 0.001), and (4) an inverse relationship between PGR and age (R = −0.15, p = 0.008), size (R = −0.23, p < 0.001), and MIB-1 (R = −0.15, p = 0.009). A weak correlation (R = 0.11, P = 0.046) between age and CEA was also found.

Conclusions: There was no relationship between preoperative serum tumor markers CEA and CA 15−3, and routine prognostic markers ER, PGR and MIB-1, which mainly inversely correlate with age of the patients, and size of the tumor.

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Prognostic factors in Mexican young women with breast cancer

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Background: Many epidemiologic studies have demonstrated that younger women with breast cancer have a worse survival than older women, which may potentially be related to more aggressive tumor biology. We studied the prognostic factors in Mexican young women with breast cancer.

Materials and Methods: Retrospective study of 136 Mexican women under 40 years with breast cancer (BC). We assessed inmunohistochemistry (IHC) studies for estrogen receptor (ER), progesterone receptor (PR), the results were scored by HScore previously described. HER-2/neu were scored positive with score 3 and score 2 was amplified by FISH with HER-2/neu CEP 17 probes (ratio $\geqslant$2.2). Clinical and pathologic features and survival were compared. Data were analyzed with the statistical package SPSS 17.

Results: Mean age was 36 years. Ductal carcinoma was observed in 87% of cases, lobular carcinoma 10.3% and others 2.2%. The percentage of stage I was 10.3%, stage II 35.3%, stage III 44.1%, stage IV 10.3%. RE was positive in 47.1% of tumors, RP 39%, HER2neu 22.8%. Tumors with HSCORE $\geqslant$200 for ER were 5.9% and PR 6.6%. High histological grade was related with tumors RE negative (p = 0.01) and RP negative (p = 0.046). Triple negative cancers (TPN) were 31% (IC95% 27.3–34.5). Median follow-up was 37.6 months. Overall 5-year and 10-year survival (OS) rates were 83.8% and 69.9% respectively. Factors associated with OS decreased in univariate analysis were advanced stage (p = 0.05), RE negative (p = 0.05), RP negative (p = 0.004), age <30 (p = 0.001), TPN (p = 0.007). After multivariate anlysis only age <30 (p = 0.001) was revealed to be independent factor for OS. The OS in patients with tumors HScore >200 was 100%.

Conclusions: TPN tumors are frequent in these patients (31%). Age <30 years is considered the only independent factor of bad prognosis in mexican women under 40 years with breast cancer.

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QuantiGene 2.0® assay for measurement of ER and PR in breast cancer

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Intoroduction: Estrogen receptor (ER) and progesterone receptor (PR) status has been used as an indicator of endocrine responsiveness and as a prognostic factor for breast cancer. At present, IHC assessment of ER and PR is recommended as standard method. However, unfortunately interlaboratory variability with IHC assessment of ER, PR is relatively high in clinical practice. The QuantiGene 2.0® assay has lower interlaboratory variability and could measure amount of RNA directly without a reverse transcription step and polymerase chain reaction process. To evaluate the utility of QuantiGene 2.0® assay for assessment of ER and PR as an alternative to immunohistochemistry (IHC), we compared disease free survival according to the quantitative expression level of ER and PR between IHC method and QuantiGene 2.0® assay method.

Materials and Methods: 171 patients who underwent breast cancer surgery between January 2003 and December 2006 were collected at Seoul St. Mary's Hospital, the Catholic University of Korea. IHC and QuantiGene 2.0® assay was done for assessment of ER and PR. Cox-proportional hazard analysis was done and concordance between IHC and QuantiGene 2.0® assay for assessment of ER and PR was evaluated.

Results: Between IHC and QuantiGene 2.0® assay result of assessment for ER and PR both were well correlated (kappa value was 0.110 and 0.115 respectively). Disease free survival difference according to the expression level of ER was not significant in both IHC and QuantiGene 2.0® assay (p-value = 0.263, 0.514 respectively). In contrast, Disease free survival difference according to the expression level of PR was statistically significant in both group (p-value = 0.001, 0.045 respectively).

Conclusion: Although, we did not show the superiority, QuantiGene 2.0® assay for quantitative assessment of ER, PR showed similar results for response to treatment compared with IHC. So, our data for validation to the treatment response could support that QuantiGene 2.0® assay might be worthwhile alternative of IHC which is considered standard for evaluation of ER and PR.

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HER2/neu receptor positivity and its correlation with other prognostic and predictive factors of breast cancer

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Background: There is consistent evidence in the literature, that overexpression of HER2/neu is associated with a worse clinical course in both node-positive and node-negative breast cancer patients. The objective of this study was to explore the relationship between HER2/neu receptor positivity and estrogen receptor status (ER), progesterone receptor status (PR), grade, tumor size, axillary nodal involvement and age in female breast cancer.

Materials and Methods: During 2005–2008, 346 consecutive female patients with invasive breast carcinoma, 307 ductal and 39 non-ductal, in which HER2/neu overexpression has been evaluated, were reviewed retrospectively. Each patient was further assessed for ER, PR, histological grade, tumor size, nodal status and age at diagnosis. Immunohistochemistry (IHC) was used to define ER, PR and HER2/neu expression status. HER2/neu was scored positive, if a 3+ immunostaining intensity result was found or amplified gene expression was present on fluorescence in situ hybridization (FISH). Statistical analysis (Chi-square and Levene's T-test) was performed using the SPSS software (Statistical Package for the Social Sciences − version 15.1). P-value of less than 0.05 was considered significant.

Results: The observed frequencies were significantly higher between HER2/neu overexpression and high tumor grade (p = 0.002), positive nodal status (p = 0.017), large tumor size (p = 0.007), ER negative (p < 0.001) and PR negative (p < 0.001) receptors in our series.

Conclusions: In summary, in this study of 346 cases of infiltrating breast carcinomas a statistically significant association was established between HER2/neu overexpression and histological grade, tumor size, ER, PR and nodal status. No statistically significant association was found between HER2/neu receptor positivity in relation to histological type and patients' age at presentation.

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Typical medullary carcinoma of the breast: experience of a single institution

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Background: Typical medullary carcinomas (TMC) of the breast account for less than 10% of all invasive breast cancers. Despite their aggressive histological features (hormonal receptors (HR) negative and grade 3), the prognosis of these tumours is generally favourable.

The aim of this retrospective study was to evaluate clinical and pathologic features, overall (OS) and disease free survival (DFS) in a population with TMC.

Methods: We reviewed all cases of TMC admitted at Instituto Português de Oncologia-Porto, between January/1985 and August/2009. We characterised TMC in terms of clinical and histopathological factors. Outcome was evaluated for OS and DFS, which were illustrated with Kaplan-Meier plots.

Results: We identified 29 cases of TMC. The average age was 54 (range from 23 to 82) years old; 62.1% were treated with modified radical mastectomy and 37.9% with conservative surgery; 65%, 55.2% and 24.1% undergo adjuvant chemotherapy, radiotherapy and hormonotherapy, correspondingly; 24.1% were stage I and 62% were stage II; 86.2% were

G3; 65.5% were node-negative; 24.1% had positive HR; only one patient (3.4%) had c-erb B2 overexpression. Distant recurrence was seen in 3 patients and 2 died with breast cancer. The 12-year DFS and OS was 87% and 88%, respectively.

Conclusions: TMC are usually considered to have a favourable prognosis which could represent a biological paradox, since its behaviour is not commensurate to its pathologic features. Although they are more frequently HR negative and grade 3, poor prognosis characteristics, they are simultaneously of early stage and c-erb B2 negative, which could be related to their favourable prognosis.

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Expression of cyclin D1 protein in breast cancer and its correlation with prognosis

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Background: Cyclin D1 is known to be a key regulator in the G1 to S transition of the cell cycle in numerous cases of human neoplasm. We performed immunohistochemical assay for cyclin D1 expression in 67 breast cancer tissues to investigate its prognostic implication in breast cancer.

Material and Methods: Protein data for cyclin D1 expression obtained by immunohistochemical staining were merged with the clinical and the biological parameters of patients, and the recurrence and the survival of the patients were analyzed according to the expression status of cyclin D1.

Results: Of 67 breast cancers, 16 cases (23.9%) showed strong expression of cyclin D1 protein. Cyclin D1 expression was significantly increased in larger tumors ($p = 0.025$) but there was no evident correlation between cyclin D1 expression and the clinical and the biological parameters of the studied patients. Although cyclin D1 is a cell cycle regulator essential for the G1 to S transition of the cell cycle, we could not identify any correlation between cyclin D1 expression and the S-phase or the G0/G1 fraction measured by flow cytometry. In the survival analyses, patients with increased expression of cyclin D1 protein had an increased incidence of recurrence and poorer survival than other patients. However, the difference was not statistically significant.

Conclusions: Increased expression of cyclin D1 protein was present in a certain proportion of breast cancer. Overexpression of cyclin D1 seemed to play a role in carcinogenesis and tumor growth. However, the clinical utility of cyclin D1 as a prognostic indicator in breast patients has to be defined further by prospective studies with larger sample sizes.

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Predicting the probability of outcome in breast cancer

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Introduction: Since it was first introduced in the 1970's the Nottingham Prognostic index (NPI) has been one of the most widely used tool in the assessment of patients with breast cancer. In the last few years machine learning methods have been developed to predict survival. As clinicians we question the usefulness of methods that only tell us whether a patient will survive ten years or die within that time. You may prefer to make a prognosis and be able to predict the likelihood of survival or death within a chosen time span. We introduce a new machine learning method which is a simple means of calculating conditional probabilities.

Methods: The Surveillance, Epidemiology, and End Results (SEER) data was analysed using the statistical packages R and Weka. Weka implements a function called NBTree() that combines the naïve Bayes classifier with a decision tree classifier to build a model that provides the probabilities of the outcomes. Results were validated using *K*-fold cross validation.

Results: Tumour size, grade and nodal status were used as prognostic indices. The model was tested with the SEER data and the process repeated 10 times. The model was validated using 10-fold cross validation and it accurately classified an average of 69.85% of instances. When the model was then tested on independent datasets it correctly classified 70% of the instances.

Conclusion: This new machine learning method provides a reliable way of putting a value or probability of survival following the diagnosis of breast cancer. The question remains as to whether this could be put into practice and whether it adds any more than more simple validated methods namely the NPI.

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Topoisomerase IIa expression correlates with prognostic factors in invasive breast cancer

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Background: Topoisomerase IIα (Topo IIα) plays a role in DNA replication and is the molecular target for anthracycline-based chemotherapy. The aim of this study was to evaluate the relationship between Topo IIα expression and prognostic factors with invasive breast cancer.

Methods and Materials: Eighty-seven patients were carried out operation diagnosed as an invasive breast cancer between July, 2003 and December, 2004. Formalin-fixed, paraffin-embedded tumor specimens from all patients were stained for Topo IIα expression. The level of Topo IIα expression within tumor cells was compared with clinical factors such as age, tumor size, hormonal receptor status, nodal status, nuclear grade, vascular invasion, HER2 status.

Result: There was a statistically significance between Topo IIα over expression and nuclear grade ($p = 0.0019$), and vascular invasion ($p = 0.0388$). A tendency to a correlation between Topo IIα over expression and tumor size, but statistical significance was not achieved. There was no significance with HER2 status.

Conclusions: Topo IIα over expression significantly correlated with nuclear grade and vascular invasion in invasive breast cancer. These findings may indicate a role for Topo IIα expression as a prognostic factor in breast cancer.

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Hormone receptor-negative breast cancer: a study of prognostic factors

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Introduction: Breast cancer (BC) is a heterogeneous group of tumors whose clinical course depends on histopathological features. The expression of hormone receptors (HR) and HER-2 overexpression are prognostic factors that have impact on survival, and help on predicting response to specific therapies. HR-negative tumors are a challenge to treatment. The introduction of anti-HER-2 treatment has changed the unfavorable prognosis of the patients with HR-negative/HER-2 positive.

Objective: Prognostic value of clinical and histopathological parameters with impact on overall survival (OS) and disease-free survival (DFS) without introduction of anti-HER-2 adjuvant treatment in HR-negative patients.

Methods: Review of clinical reports of patients admitted between January 2003 and December 2004 a cancer treatment hospital. The variables were: demographics data, clinical and histological findings, kind of treatment and clinical evolution. Survival rates and descriptive analysis using the Kaplan-Meyer method.

Results: A total of 170 patients, the median age of the patients was 54 years old (20−85), 57% were postmenopausal, G3 in 58%; TNM Stage II 42% and Stage III 35%, HER-2 overexpression in 48.5%, 82% treated with anthracycline chemotherapy, DFS at 5 years were 73% and OS 77%. Pre-menopausal patient ($p = 0.002$) and advanced stage ($p < 0.0001$) had statistically significantly better DFS. HER-2 positive group had better DFS (0.0002). In the analysis of the OS only the stage had statistically significant difference ($p < 0.0001$).

Conclusions: HR-negative BC, were associated with poor prognosis features, such as: degree of differentiation G3 (58%) and TNM stage II and III (77%). Advanced stages were associated with lower DFS and OS. Factors with negative impact on the DFS like pre-menopausal group and HER-2 overexpression show no statistically significant difference in OS. The introduction of new adjuvant therapies, including taxanes and trastuzumab, will improve outcomes in this group. It might be expected that the anti HER-2 adjuvant therapies improve the poor prognosis of HR-negative/HER-2 positive tumors.