with bone metastasis do not have pain and are asymptomatic. This is the first study that assesses the pattern of disease and outcome of breast cancer patients with asymptomatic bone metastasis.

Material and Methods: We did a retrospective study of all breast cancer patients with asymptomatic bone metastasis from January 2009 to December 2010. The inclusion criteria were females with breast cancer with bone scan or PET scan positive for bone metastasis. All patients were completely asymptomatic with respect to bone metastasis. In all 70 patients were analysed. In each case the decision for treating patients with systemic therapy/radiotherapy/bisphosphonates was taken by the Joint Clinic/Radiation Oncologist at the hospital. In general radiotherapy was given only when the involved area was weight bearing areas/with gross bony involvement.

Results: Out of 70 patients, 38(54.3%) were post menopausal. 44(62.9%) patients had bone metastasis at presentation while 26(37.1%) had these at some stage of their follow up for radically treated breast cancer. 36(51.4%) patients had a single site of bone metastasis while the rest had multiple sites of involvement. 44(62.9%) patients had ER and/or PR receptor positivity. Overall, bone metastasis were detected by bone scan in 57 (87.4%), PET scan in 11 (15.7%) and CT scan 2(2.9%). There was no other site of metastasis in 47(67.1%) while the rest of the patients had other site of metastasis including liver 8(11.4%), lung 11(15.7%) or multiple 4(5.8%). Only 8(11.4%) patients received immediate RT, while delayed radiotherapy had to be given in 12(17.1%). No radiotherapy was given in 49(70%) patients till last follow up. Overall, at median follow up of 8 months, only 16(22.9%) patients became symptomatic for their bone metastasis. 75 patients received some form of systemic chemotherapy during their overall course. At last follow up 63(90%) were alive.

Conclusion: The baseline clinical and pathological features of breast cancer patients with asymptomatic bone metastasis have been presented. Patients with asymptomatic bone metastasis are a favourable subgroup. Further prospective and randomised trials would confirm our findings and establish the optimal treatment in such patients.

5035   POSTER

Quality Indicators Used to Measure Adherence to Standards of Breast Cancer Care − a Single Institutional Study From Ukraine

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Background: Data of the Ukrainian National Cancer Registry were analyzed for purpose to evaluate the quality of operable breast cancer care in a tertiary care institution. Quality Indicators has been proven to detect breast cancer at an early stage and, when followed up with appropriate diagnosis and treatment, to reduce mortality from breast cancer as well as improvement of survivorship, over time. The purpose of this systematic research was to survey the range of measures assessing the quality of breast cancer care in women and to characterize specific parameters potentially affecting their suitability for wider use in Ukraine.

Material and Methods: Quality Indicators were based on an international consensus and review of 143 Indicators that have been developed by the University of Ottawa Evidence-based Practice Center for the Agency for Healthcare Research and Quality. Twenty-six quality indicators: 5 structure-related, 16 relating to process (6 diagnosis-related and 10 treatment-related indicators) and 5 outcome-related (e.g., quality of life) were used to measure the quality of care in 1461 breast cancer patients treated from 2000 to 2005. Data were abstracted from the charts of these patients. Adherence to each indicator was based on the number of procedures performed divided by the number of patients eligible for that procedure. This research explores whether 100% adherence to a set of quality indicators applied to individuals with breast cancer is associated with better survival, and was done in Ukraine the first time. The main analysis of adherence was dichotomous (ie, 100% adherence vs. <100% adherence). The outcome measures studied were 5-year overall survival and progression-free survival, calculated using the Kaplan–Meier method. The Cox's proportional hazard regression model was used for univariate and multivariate analyses.

Results: Most patients received care that demonstrated good adherence to the quality indicators. Multivariate analysis revealed that 100% adherence to entire set of quality indicators was significantly associated with better overall survival [hazard ratio (HR): 0.46; 95% confidence interval (CI): 0.34–0.63] and progression-free survival (HR 0.51; 95% CI, 0.39–0.68). One hundred percent adherence to treatment indicators alone was also associated with statistically significant improvements in overall and progression-free survivals.

Conclusions: Our study strongly supports that 100% adherence to evidence supported quality of care indicators is associated with better survival rates for breast cancer patients and should be a priority for practitioners. Our study demonstrated that the quality of breast cancer care

in this institution was below the accepted international standards. However, this study may be used to make interventions for improvement of quality in similar institutions all over the Ukraine.

5036   POSTER

Clinical and Pathological Prognostic Characteristic of Breast Cancer Patients With Brain Metastases

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Successful improvement in breast cancer patient's treatment leads to life prolongation. This is connected with rising incidence of brain metastases (BM) which occurs in up to one third of patients with metastatic breast cancer. The aim of this study is to analyze clinical and patological factors in patients with BM.

This is a retrospective study of 247 breast cancer patients with brain metastases, treated with brain radiotherapy between 2005–2009 at two Cancer Centres, Gliwice, Krakow. Previously we presented data from patients treated between 2005–2007.

Patient's age at time of diagnosis ranged from 25 to 80 years, average 51 years. Patients' stages at time of cancer diagnosis were: T1−2: 38%, T3−4: 42%, N0−1: 54%, N2−3: 27%.

Majority of patients were treated primary with radical intent 81%. Most of patients underwent radical mastectomy 74% or breast conserving therapy 6%. Ductal invasive carcinoma was the predominant histology accounts for 65%. Lymph nodes metastases were present in 45% of patients with median lymph nodes ratio 17%. Tumours were ER,Pr receptor positive only in 31% and 26%, and only 13% for ER and 10% PR were highly positive. We are able to establish HER2 status in 54% of patients and in 22% HER2 was negative, and highly positive in 19%.

All patients were treated with radiotherapy, 58% underwent whole brain radiotherapy, 19% underwent metastasectomy, 36% stereotactic irradiation, in combination with WBRT 18% or alone 8%. Median time from diagnosis to BM was 2.8 years (range 0−21), to distant relapse 2.1 or local relapse 2.6. Single Bm was diagnosed in 28%, and multiple metastases in 32% of patients, remaining had 2−7 lesions.

Median time from treatment dissemination to brain relapse was 0.24 years. Median time to BM was 2.9 years. Median time to BM was longer in ER+ patients 3.8 years vs ER− patients 2.3, and PR+ patients 3.7 years vs PR− patients 2.3. A median time to BM shortened with T stage and N stage. Advanced stages, ER−, PR−, are related to higher risk of BM. Major cause of death was brain metastases, therefore further studies are needed for early BM patients selection.

5037   POSTER

A Dosimetric Comparison of Inverse Intensity-modulated Radiotherapy and Forward Intensity-modulated Radiotherapy for Breast Cancer After Radical Mastectomy

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Background: To evaluate the dose distribution of target volume and normal tissues in forward intensity modulated radiotherapy (f-IMRT) and inverse intensity modulated radiotherapy (IMRT) planning for breast cancer after radical mastectomy.

Materials and Methods: Ten patients with breast cancer who received radical mastectomy were enrolled in this study. On each patient's CT images the supraclavicular, chest wall and internal mammary areas were delineated. FIMRT and IMRT plans were performed for each patient. The prescription dose was 50 Gy in 25 fractions. fIMRT plans for the supraclavicular and the chest wall area using 6 MV X-ray irradiation, internal mammary area with 9−12 MeV electron irradiation, according to the three regions of dose adjust the doses of cold and hot fit. IMRT plans were take supraclavicular, chest wall and internal mammary area as a whole target, using 6 MV X-ray, performing inverse optimal design. The dose distribution of target volume and normal tissues, conformal index (CI), and heterogeneous index (HI) were analyzed using the dose-volume histogram (DVH) for the two intensity modulated modes.

Results: The maximum dose of PTV in IMRT plan was lower than that of f-IMRT plan ($t = -3.23$, $P < 0.05$), the minimum dose and $V_{95\%}$ of PTV were higher than that of f-IMRT plan ($t = 4.08$, -2.69, $P < 0.05$), About CI and HI, IMRT plan were better than f-IMRT plan ($t = -3.13$, 2.74, $P < 0.05$). The differences of V_{10}, V_{20}, V_{25}, V_{30} and D_{mean} of ipsilateral lung were not statistically significant. However, the V_{15} of ipsilateral lung in IMRT was 4.2% less than that in f-IMRT, which was statistically significant ($t = 3.2$, $P < 0.05$). There was no significant difference in D_{mean} and V_{30} of heart, D_{mean} of contralateral lung and contralateral breast between two modes.