Online Supplemental Materials

Table 1. Relationship of Patient and Tumor Characteristics in a Cohort of Older Breast Cancer Patients (n=705)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Tumor Features | | | | | | | | | |
|  | HER2+ ‡ | HER2- ‡ | p-value | Tumor  <2 cm | Tumor  2+ cm | p- value | Stage 0/I | Stage II/III | p- value |
|  | Mean (SD) or Percent (n) | | | | | | | | | |
| Age, years | 67.3 (5.4) | 68.1 (5.9) | 0.286 | 68.0 (5.7) | 68.0 (5.9) | 0.901 | 68.2 (5.8) | 67.7 (5.8) | 0.369 |
| Race  White  Non-white\* | 78.8% (52)  21.2% (14) | 79.7% (440)  20.3% (112) | 0.860 | 81.5% (397)  18.5% (90) | 74.2% (144)  25.8% (50) | 0.034 | 80.4% (405)  19.6% (99) | 75.3% (143)  24.7% (47) | 0.142 |
| Education, years | 15.0 (2.2) | 15.3 (2.2) | 0.189 | 15.5 (2.1) | 14.9 (2.2) | 0.005 | 15.4 (2.2) | 15.0 (2.1) | 0.015 |
| Medicaid  Yes  No | 3.4% (2)  96.6% (57) | 4.0% (21)  96.0% (501) | 0.813 | 3.3% (15)  96.7% (440) | 5.0% (9)  95.0% (172) | 0.317 | 3.4% (16)  96.6% (455) | 4.0% (7)  96.0% (170) | 0.732 |
| WRAT score | 108.4 (15.3) | 110.4 (15.2) | 0.328 | 110.3 (14.8) | 109.3 (16.1) | 0.427 | 110.0 (14.9) | 109.7 (15.8) | 0.768 |
| CES-D Cut-off 16+ | 17.2% (10) | 11.4% (58) | 0.196 | 11.2% (50) | 16.5% (29) | 0.076 | 10.2% (47) | 18.2% (31) | 0.006 |
| STAI Cut-off >44 | 11.7% (7) | 5.6% (29) | 0.067 | 5.5% (25) | 7.3% (13) | 0.410 | 4.1% (19) | 10.3% (18) | 0.003 |
| Comorbidities | 2.7 (2.0) | 2.8 (2.0) | 0.743 | 2.8 (1.9) | 2.9 (2.2) | 0.477 | 2.8 (2.0) | 2.7 (2.0) | 0.552 |

\* non-White includes Black and Asian

\*\* Scores on the State-Trait Anxiety Inventory range from 20 to 80, with higher scores reflecting more anxiety; a cut point of >44 is used to define clinical anxiety.

† Scores on the Center for Epidemiologic Studies Depression Scale range from 0-60, with higher scores representing more depressive symptoms; a cut point of 16+ is used to define clinical depression.

‡ HER2 positivity was defined as scoring 3+ on HER2 IHC, or tested positive on HER2 FISH, or going on to receive Herceptin treatment.

❡ Hormone receptor positive was defined as being estrogen receptor (ER) positive and/or progesterone receptor (PR) positive.

Table 2a. Adjusted1 Pre-systemic Therapy Cognitive Function by Tumor Characteristics among Older Patients with Non-Metastatic Breast Cancer,

Controlling for Depression2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | FACT-Cog PCI Score3 | | Attention, Processing Speed, Executive Function4 | | Learning and Memory4 | |
|  | Adjusted | | Adjusted | | Adjusted | |
| Stage | | | | | | |
| Stage 0/I | 57.4 (0.8) | p=0.674 | **-.261 (0.046)** | **p=0.014** | -.381 (0.058) | p=0.298 |
| Stage II/III | 57.0 (0.9) |  | **-.398 (0.056)** |  | -.308 (0.071) |  |
| HER25 |  | | | | | |
| Negative | **57.2 (0.8)** | **p=0.059** | -.334 (0.047) | p=0.828 | -.395 (0.059) | p=0.284 |
| Positive | **54.6 (1.4)** |  | -.315 (0.088) |  | -.510 (0.110) |  |
| Tumor size |  | | | | | |
| <2 cm | **57.5 (0.8)** | **p=0.056** | -.281 (0.046) | p=0.125 | -.381 (0.058) | p=0.269 |
| 2+ cm | **55.8 (0.9)** |  | -.364 (0.055) |  | -.306 (0.070) |  |

1. Unadjusted scores for each individual categorical tumor characteristic were calculated from simple linear regression models, with significance testing based on Type III tests. Adjusted cognitive scores for each individual categorical tumor characteristic were controlled for age, race, and recruitment site from linear regression models.

2. Scores on the Center for Epidemiologic Studies Depression Scale range from 0-60, with higher scores representing more depressive symptoms; a cut point of ≥16 is used to define clinical depression.

3. Scores on the FACT-Cog perceived cognitive impairment scale range from 0-72, with higher scores represent better cognitive function. This is our primary outcome.

4. Z-scores for neurological tests within each domain range from -3 to +3, with a mean of 0. A positive score indicates better cognitive performance and a negative score reflects worse than average scores.

5. HER2 positivity was defined as scoring 3+ on HER2 IHC, or tested positive on HER2 FISH, or receiving Herceptin treatment.

Table 2b. Adjusted1 Pre-systemic Therapy Cognitive Function by Tumor Characteristics among Older Patients with Non-Metastatic Breast Cancer, Controlling for Anxiety

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | FACT-Cog PCI Score3 | | Attention, Processing Speed, Executive Function4 | | Learning and Memory4 | |
|  | Adjusted | | Adjusted | | Adjusted | |
| Stage | | | | | | |
| Stage 0/I | 57.9 (1.0) | p=0.328 | **-.287 (0.059)** | **p=0.008** | -.378 (0.075) | p=0.448 |
| Stage II/III | 57.0 (1.1) |  | **-.434 (0.065)** |  | -.325 (0.082) |  |
| HER25 | | | | | | |
| Negative | **58.0 (1.0)** | **p=0.045** | -.366 (0.059) | p=0.584 | -.386 (0.073) | p=0.289 |
| Positive | **55.1 (1.6)** |  | -.320 (0.093) |  | -.499 (0.116) |  |
| Tumor size | | | | | | |
| <2 cm | **57.7 (1.0)** | **p=0.025** | -.321 (0.058) | p=0.102 | -.387 (0.073) | p=0.277 |
| 2+ cm | **55.6 (1.1)** |  | -.409 (0.066) |  | -.313 (0.083) |  |

1. Unadjusted scores for each individual categorical tumor characteristic were calculated from simple linear regression models, with significance testing based on Type III tests. Adjusted cognitive scores for each individual categorical tumor characteristic were controlled for age, race, and recruitment site from linear regression models.

2. Scores on the State-Trait Anxiety Inventory range from 20 to 80, with higher scores reflecting more anxiety; a cut point of >44 is used to define clinical anxiety.

3. Scores on the FACT-Cog perceived cognitive impairment scale range from 0-72, with higher scores represent better cognitive function. This is our primary outcome.

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5. HER2 positivity was defined as scoring 3+ on HER2 IHC, or tested positive on HER2 FISH, or receiving Herceptin treatment.