**Additional Table S1. Correlation between patient and disease characteristics and the detection of CTCs and CTC-phenotypes before the administration of chemotherapy**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***HER2-positive disease*** | ***Total***  ***CK+ CTCs*** | | ***CSC+/partial-EMT+***  ***CTCs*** | | ***CSC+/epithelial-like***  ***CTCs*** | | ***non-CSC+/partial-EMT+***  ***CTCs*** | | ***non-CSC+/epithelial-like CTCs*** | |
| ***Patient characteristics*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** |
| **Age** (≤59y vs. >59y) | 46.2 vs. 46.7 | 0.978 | 30.8 vs. 26.7 | 1.000 | 0 vs. 20 | 0.226 | **-** | - | 15.4 vs. 20 | 1.000 |
| **Menopausal status**  (pre vs. post) | 36.4 vs. 50 | 0.599 | 27.3 vs. 21.4 | 0.325 | 0 vs. 14.3 | 0.211 | **-** | - | 9.1 vs. 21.4 | 0.552 |
| **Performance status**  (0-1 vs. 2-3) | 47.6 vs. 42.9 | 1.000 | 28.6 vs. 28.6 | 1.000 | 4.8 vs. 28.6 | 0.145 | **-** | - | 19 vs. 14.3 | 1.000 |
| **Grade** (I/II vs. III) | **9.1 vs. 68.8** | **0.005** | 9.1 vs. 43.8 | 0.090 | 0 vs. 18.8 | 0.248 | **-** | - | 0 vs. 25 | 0.123 |
| ***Molecular subtype*** |  |  |  |  |  |  |  |  |  |  |
| **ER (+ve) tumor** (yes/no) | 53.3 vs. 38.5 | 0.431 | 26.7 vs. 30.8 | 1.000 | 0 vs. 20 | 0.226 | - | - | 26.7 vs. 7.7 | 0.333 |
| **PgR (+ve) tumor** (yes/no) | 56.2 vs. 33.3 | 0.276 | 37.5 vs. 16.7 | 0.401 | 0 vs. 18.8 | 0.248 | - | - | 18.8 vs. 16.7 | 1.000 |
| **Adjuvant chemo** (yes/no) | 33.3 vs. 56.2 | 0.276 | 16.7 vs. 37.5 | 0.401 | 8.3 vs. 12.5 | 1.000 | - | - | 16.7 vs. 18.8 | 1.000 |
| ***Metastatic sites*** |  |  |  |  |  |  |  |  |  |  |
| **LN metastases** (yes/no) | 50 vs. 42.9 | 0.705 | 35.7 vs. 21.4 | 0.678 | 7.1 vs. 14.3 | 1.000 | - | - | 21.4 vs. 14.3 | 1.000 |
| **Lung metastases** (yes/no) | 58.3 vs. 37.5 | 0.274 | 41.7 vs. 18.8 | 0.231 | 8.3 vs. 12.5 | 1.000 | - | - | 25 vs. 12.5 | 0.624 |
| **Bones metastases** (yes/no) | 46.2 vs. 46.7 | 0.978 | 15.4 vs. 40 | 0.221 | 15.4 vs. 6.7 | 0.583 | - | - | 23.1 vs. 13.3 | 0.639 |
| **Liver metastases** (yes/no) | 45.5 vs. 47.1 | 0.934 | 27.3 vs. 29.4 | 1.000 | 9.1 vs. 11.8 | 1.000 | - | - | 9.1 vs. 23.5 | 0.619 |
| **Skin metastases** (yes/no) | 25 vs. 50 | 0.600 | 0 vs. 33.3 | 0.295 | 0 vs. 12.5 | 1.000 | - | - | 25 vs. 16.7 | 1.000 |
| **CNS metastases** (yes/no) | 0 vs. 50 | 0.484 | 0 vs. 30.8 | 1.000 | 0 vs. 11.5 | 1.000 | - | - | 0 vs. 19.2 | 1.000 |
| **No. of affected organs**  (1-2 vs. ≥ 3) | 46.7 vs. 46.2 | 0.978 | 33.3 vs. 23.1 | 0.686 | 13.3 vs. 7.7 | 1.000 | - | - | 6.7 vs. 30.8 | 0.153 |
| ***HER2-negative disease*** | ***Total***  ***CK+ CTCs*** | | ***CSC+/partial-EMT+***  ***CTCs*** | | ***CSC+/epithelial-like***  ***CTCs*** | | ***non-CSC+/partial-EMT+***  ***CTCs*** | | ***non-CSC+/epithelial-like CTCs*** | |
| ***Patient characteristics*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** | ***(+ve) Patient %*** | ***p value*** |
| **Age** (≤59y vs. >59y) | 56.2 vs. 68.2 | 0.239 | 27.1 vs. 31.8 | 0.618 | 8.3 vs. 18.2 | 0.219 | 16.7 vs. 20.5 | 0.640 | 31.2 vs. 34.1 | 0.772 |
| **Menopausal status**  (pre vs. post) | 63 vs. 60.7 | 0.842 | 29.6 vs. 31.1 | 0.415 | 7.4 vs. 16.4 | 0.860 | 18.5 vs. 18 | 0.941 | 33.3 vs. 31.1 | 0.748 |
| **Performance status**  (0-1 vs. 2-3) | 61.7 vs. 55.6 | 0.731 | 28.4 vs. 22.2 | 1.000 | 14.8 vs. 0 | 0.602 | 19.8 vs. 11.1 | 1.000 | 33.3 vs. 33.3 | 1.000 |
| **Grade** (I/II vs. III) | 64.1 vs. 65.1 | 0.924 | 28.2 vs. 32.6 | 0.669 | 17.9 vs. 11.6 | 0.419 | 17.9 vs. 18.6 | 0.939 | 38.5 vs. 32.6 | 0.577 |
| ***Molecular subtype*** |  |  |  |  |  |  |  |  |  |  |
| **ER (+ve) tumor** (yes/no) | 65.7 vs. 50 | 0.214 | 30 vs. 27.3 | 0.806 | 15.7 vs. 4.5 | 0.281 | 22.9 vs. 4.5 | 0.063 | 32.9 vs. 31.8 | 0.928 |
| **PgR (+ve) tumor** (yes/no) | 67.7 vs. 50 | 0.100 | 30.6 vs. 26.7 | 0.694 | 16.1 vs. 6.7 | 0.324 | 22.6 vs. 10 | 0.166 | 32.3 vs. 33.3 | 0.918 |
| **Triple (-ve) tumor** (yes/no) | 52.6 vs. 64.4 | 0.347 | 26.3 vs. 30.1 | 0.745 | 5.3 vs. 15.1 | 0.448 | 5.3 vs. 21.9 | 0.181 | 36.8 vs. 31.5 | 0.659 |
| **Adjuvant chemo** (yes/no) | 56 vs. 69 | 0.199 | 32 vs. 26.2 | 0.542 | 16 vs. 9.5 | 0.536 | 16 vs. 21.4 | 0.504 | 30 vs. 35.7 | 0.560 |
| ***Metastatic sites*** |  |  |  |  |  |  |  |  |  |  |
| **LN metastases** (yes/no) | **77.8 vs. 54.8** | **0.041** | 33.3 vs. 27.4 | 0.573 | 11.1 vs. 14.5 | 1.000 | 25.9 vs. 16.1 | 0.280 | **48.1 vs. 25.8** | **0.039** |
| **Lung metastases** (yes/no) | **81.8 vs. 50** | **0.003** | **42.4 vs. 21.4** | **0.035** | 18.2 vs. 10.7 | 0.349 | 24.2 vs. 16.1 | 0.344 | 30.3 vs. 33.9 | 0.724 |
| **Bones metastases** (yes/no) | 54.8 vs. 68.1 | 0.197 | 31 vs. 27.7 | 0.733 | 11.9 vs. 14.9 | 0.763 | 28.6 vs. 10.6 | 0.057 | 28.6 vs. 36.2 | 0.445 |
| **Liver metastases** (yes/no) | 64.5 vs. 60.3 | 0.700 | 25.8 vs. 31 | 0.605 | 12.9 vs. 13.8 | 1.000 | 22.9 vs. 4.5 | 0.063 | 38.7 vs. 29.3 | 0.367 |
| **Skin metastases** (yes/no) | 33.3 vs. 63.9 | 0.197 | 16.7 vs. 30.1 | 0.667 | 0 vs. 14.5 | 1.000 | 16.7 vs. 19.3 | 1.000 | 16.7 vs. 33.7 | 0.659 |
| **CNS metastases** (yes/no) | 60 vs. 61.9 | 1.000 | 0 vs. 31 | 0.316 | 20 vs. 13.1 | 0.524 | 20 vs. 19 | 1.000 | 40 vs. 32.1 | 0.659 |
| **No. of affected organs**  (1-2 vs. ≥ 3) | 57.4 vs. 71.4 | 0.205 | 27.9 vs. 32.1 | 0.681 | 13.1 vs. 14.3 | 1.000 | 18 vs. 21.4 | 0.705 | 31.1 vs. 35.7 | 0.669 |

Table S1 shows the associations between the different clinicopathological parameters and the detection of CTCs and CTC phenotypes at baseline. In the HER2-positive setting, the detection of CK+ CTCs was associated with Grade III tumor status; no correlation was observed between the presence of different CTC subsets and clinicopathological parameters. Among HER2-negative patients, the detection of CK+CTCs was correlated to LN and lung metastases; patients with LN metastases more frequently harbored non-CSC+/epithelial-like CTCs, whereas in those with lung metastases, CSC+/partial-EMT+ CTCs were mainly identified. All the associations were investigated by Chi-square two-sided tests.