**Supplementary Table 1. Comparison of study variables between the study and control groups**

| Variables | Study group (n=30) | Control group (n=30) | p-value* |
|---|---|---|---|
| **Qualitative variables** | | | |
| **Educational status; n (%)**<br>Primary or middle school<br>High school<br>Undergraduate or above | 11 (37)<br>9 (30)<br>10 (33) | 10 (33)<br>8 (27)<br>12 (40) | 0.972 |
| **Economic level; n (%)**<br>Lower income<br>Middle income<br>Higher income | 8 (27)<br>13 (43)<br>9 (30) | 9 (30)<br>11 (37)<br>10 (33) | 0.512 |
| **Occupation; n (%)**<br>Housewife<br>Retired worker<br>Retired officer | 8 (27)<br>12 (40)<br>10 (33) | 4 (13)<br>12 (40)<br>14 (47) | 0.362 |
| **Marital status; n (%)**<br>Married<br>Single | 20 (67)<br>10 (33) | 19 (63)<br>11 (37) | 0.402 |
| **Smoking habits; n (%)**<br>Never smoking<br>Quit smoking (>10 years)<br>Active smoker | 6 (20)<br>9 (30)<br>15 (50) | 11 (37)<br>13 (43)<br>6 (20) | **0.014** |
| **Quantitative variables** | | | |
| **Weight (kg); median (min-max)** | 76 (52-88) | 74 (48-89) | 0.254 |
| **Height (cm); median (min-max)** | 169 (148-178) | 170,5 (148-176) | 0.449 |
| **BMI (kg/m²); median (min-max)** | **20.1 (17.2-24.4)** | 20.8 (17.1-25.2) | 0.412 |
| **BSA (m²); median (min-max)** | 1.74 (1.54-2.21) | 1.71 (1.48-2.24) | 0.345 |
| **Baseline scores of MMSE sub-scales****<br>Orientation<br>Registration memory<br>Attention-calculation<br>Recall<br>Language | 9.37±0.589<br>2.94±0.437<br>4.91±0.493<br>2.96±0.486<br>8.41±0.449 | 9.46±0.537<br>2.75±0.512<br>4.98±0.476<br>2.95±0.417<br>8.94±0.437 | 0.596<br>0.333<br>0.939<br>0.914<br>0.209 |
| **Baseline MMSE total score; mean ± SD** | 28.59±1.02 | 28.69±1.01 | 0.412 |
| **Baseline serum tryptophan level (ng/mL); mean ± SD** | 49.37±28.62 | 97.97±47.75 | **<0.001** |

*: Statistical significance is indicated by p-values in bold. Chi-square test and Fisher's exact test were used for comparing categorical variables, and independent samples t-test and Mann-Whitney U test were used for continuous variables. Mean and standard deviations were presented for normally distributed variables, and medians and ranges were given for non-normally distributed variables, **: Scores considered normal for the sub-dimensions: orientation (10), recording memory (3), attention-calculation (5), recall (3), language (9). The maximum total score is 30, BMI: Body mass index, BSA: Body surface area, MMSE: Mini-mental state examination, SD: Standard deviation

**Supplementary Table 2. Comparison of changes over time in total MMSE and FACT-G scores during treatment in the study group**

| Variables | Baseline | After 6-cycle treatment | Follow-up* | p value$^{\alpha}$<br>Δ Baseline-after 6-cycle treatment | p-value$^{\beta}$<br>Δ Baseline-follow-up* |
|---|---|---|---|---|---|
| **MMSE (mean ± SD)**** | | | | | |
| Orientation | **9.37±0.589** | 8.79±0.73 | 8.09±0.866 | **0.044** | **<0.001** |
| Registration memory | **2.94±0.437** | 2.23±0.61 | 2.21±0.6 | **0.037** | **<0.001** |
| Attention-calculation | **4.91±0.493** | 3.85±0.78 | 3.76±0.496 | 0.212 | **<0.001** |
| Recall | **2.96±0.486** | 1.94±0.78 | 1.09±0.374 | 0.435 | **<0.001** |
| Language | **8.41±0.449** | 8.05±0.65 | 7.94±0.65 | 0.345 | **<0.001** |
| Total score | **26.91±1.02** | 26.01±1.04 | 23.67±2.78 | 0.216 | **<0.001** |
| **FACT-G (mean ± SD)***** | | | | | |
| Physical | 24.04±0.871 | 21.5±1.136 | 24.9±0.871 | **<0.001** | 0.691 |
| Social-family support | 24.4±1.003 | 18.3±1.061 | 24.6±1.074 | **<0.001** | 0.462 |
| Emotional | 15.13±1.655 | 13.46±1.041 | 17.11±1.746 | **<0.001** | 0.373 |
| Functional | 25.3±1.263 | 19.8±0.664 | 25.4±1.296 | **<0.001** | 0.676 |
| Total score | 88.8±2.451 | 73.2±1.756 | 88.7±2.412 | **<0.001** | 0.618 |

*: Follow-up: at control after 3 months completed 12-cycles treatment, **: Scores in MMSE considered normal for the sub-dimensions: orientation (10), registration memory (3), attention-calculation (5), recall (3), and language (9). The total score range is 0-30, ***: Scores in FACT-G considered normal for the sub-dimensions: physical (0-28), social- family support (0-28), emotional (0-24), and functional (0-28). The total score range is 0-108, $^{\alpha}$: This analysis compares the changes between the baseline and the interim control after completing 6 cycles of chemotherapy, and also the changes between the baseline and follow-up scores, $^{\beta}$: This analysis compares the measurements taken at baseline, interim control after 6 cycles of treatment, and the final control 3 months after completing 12 cycles of chemotherapy. In both the $^{\alpha}$ and $^{\beta}$ analyses, statistically significant p-values are indicated in bold. Statistical significance is indicated by p-values in bold. Repeated measures ANOVA was used to compare changes over time, with Bonferroni correction for multiple comparisons. Differences between baseline and interim or follow-up scores were assessed using paired t-tests, Δ: Difference between, MMSE: Mini-mental state examination, FACT-G: Functional assessment of cancer therapy-general, SD: Standard deviation

**Supplementary Table 3. Correlation analysis of differences between baseline and post-12 cycle chemotherapy follow-up mmse total score and serum tryptophan levels with study variables**

| Variables | Decrease in difference between baseline and follow-up MMSE total scores | | Decrease in difference between baseline and Follow-up serum tryptophan levels | |
|---|---|---|---|---|
| | rSpearman | p-value$^{\alpha}$ | rSpearman | p-value$^{\beta}$ |
| **Age (year); (≥71 vs. ≤70)** | 0.409 | 0.348 | -0.397 | 0.274 |
| **Baseline weight (kg); (lower vs. other)** | 0.215 | 0.265 | 0.379 | 0.079 |
| **Baseline BMI (kg/m²); (lower vs. other)** | 0.372 | 0.374 | 0.214 | 0.342 |
| **Baseline BSA (m²) (<2 vs. (≥2)** | 0.414 | 0.314 | 0.379 | 0.212 |
| **Leukocyte count (µL); (higher$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | -0.317<br>-0.294 | 0.194<br>0.265 | -0.415<br>-0.567 | 0.475<br>0.518 |
| **Neutrophil count (µL); (higher$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | -0.394<br>-0.386 | 0.374<br>0.216 | -0.346<br>-0.412 | 0.678<br>0.347 |
| **Lymphocyte count (µL); (higher$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | -0.401<br>-0.296 | 0.534<br>0.486 | -0.396<br>-0.318 | 0.374<br>0.514 |
| **Platelet count (x10³/µL); (higher$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | -0.264<br>-0.312 | 0.567<br>0.607 | -0.541<br>-0.494 | 0.214<br>0.396 |
| **Hemoglobin level (g/dL); (lower$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | 0.541<br>0.463 | 0.312<br>0.096 | 0.642<br>0.517 | 0.376<br>0.245 |
| **Serum CRP level (mg/L); (higher$^{\kappa}$ vs. other)**<br>Baseline<br>Follow-up* | -0.375<br>-0.369 | 0.412<br>0.214 | -0.456<br>**-0.614** | 0.514<br>**<0.001** |
| **Baseline FACT-G scores; (lower$^{\kappa}$ vs. normal)**<br>Physical<br>Social-family support<br>Emotional<br>Functional<br>Total score | 0.456<br>0.496<br>**0.506**<br>0.278<br>0.399 | 0.124<br>0.094<br>**0.037**<br>0.116<br>0.069 | 0.215<br>0.334<br>0.245<br>0.309<br>0.176 | 0.367<br>0.217<br>0.109<br>0.278<br>0.093 |
| **Follow-up FACT-G scores; (lower$^{\kappa}$ vs. normal)**<br>Physical<br>Social-family support<br>Emotional<br>Functional<br>Total score | 0.396<br>0.315<br>0.267<br>0.216<br>0.278 | 0.249<br>0.105<br>0.345<br>0.467<br>0.507 | 0.109<br>0.129<br>0.205<br>0.198<br>0.207 | 0.461<br>0.507<br>0.399<br>0.376<br>0.415 |
| **Δ FACT-G scores; (lower$^{\kappa}$ vs. normal)**<br>Physical<br>Social-family support<br>Emotional<br>Functional<br>Total score | 0.207<br>0.315<br>0.107<br>0.243<br>0.319 | 0.419<br>0.275<br>0.397<br>0.406<br>0.329 | 0.198<br>0.102<br>0.205<br>0.112<br>0.281 | 0.479<br>0.513<br>0.343<br>0.396<br>0.474 |
| **Baseline MMSE scores; (lower$^{\kappa}$ vs. normal)**<br>Orientation<br>Registration memory<br>Attention-calculation<br>Recall<br>Language<br>Total score | N/A | N/A | 0.245<br>0.378<br>0.215<br>0.107<br>0.116<br>0.187 | 0.411<br>0.506<br>0.416<br>0.398<br>0.299<br>0.474 |
| **Follow-up MMSE scores; (lower$^{\kappa}$ vs. normal)**<br>Orientation<br>Registration memory<br>Attention- calculation<br>Recall<br>Language<br>Total score | N/A | N/A | 0.315<br>0.337<br>0.401<br>0.294<br>0.384<br>**0.694** | **0.014**<br>**0.004**<br>**0.024**<br>**0.006**<br>**<0.001**<br>**<0.001** |
| **Δ MMSE scores; (lower$^{\kappa}$ vs. normal)**<br>Orientation<br>Registration memory<br>Attention-calculation<br>Recall<br>Language<br>Total score | N/A | N/A | 0.479<br>0.513<br>0.343<br>0.396<br>0.417<br>**0.654** | **<0.001**<br>**0.007**<br>**<0.001**<br>**<0.001**<br>**<0.001**<br>**<0.001** |
| **Serum tryptophan level (<cut-off$^{\kappa}$ vs. >cut-off value)**<br>Baseline<br>Follow-up*<br>Δ | 0.414<br>**0.694**<br>**0.654** | 0.474<br>**<0.001**<br>**<0.001** | **N/A** | **N/A** |

*: Follow-up: at control after 3 months completed 12-cycles treatment, $^{\kappa}$: For leukocyte, neutrophil, lymphocyte, and platelet counts, the "higher" value refers to a level above the upper limit of the normal range. The "other" category includes values within the normal range or below the lower limit of the normal range. For hemoglobin, the "lower" value refers to a level below the lower limit of the normal range. The "other" category includes values within the normal range or higher. Additionally, the calculated cut-off value for serum tryptophan level was 19.94 ng/mL, $^{\alpha}$: This analysis examines the correlation between the change in the total MMSE score from baseline to the final control, 3 months after completing 12 cycles of chemotherapy, and the study variables. $^{\beta}$: This analysis examines the correlation between the change in serum tryptophan levels from baseline to the final control, 3 months after completing 12 cycles of chemotherapy, and the study variables. In both the $^{\alpha}$ and $^{\beta}$ analyses, statistically significant p-values and associated rSpearman values are indicated in bold, MMSE: Mini-mental state examination, BMI: Body mass index, BSA: Body surface area, CRP: C-reactive protein, Δ: Difference between, N/A: Not-analyzed