**Supplementary Table S1** Patient characteristics at pre-CCRT (n = 88).

| Characteristics | Median [Interquartile Range] or Number [%] | *P* |
| --- | --- | --- |
| Group A |  | Group B |
| Male | 26 [59%] |  | 23 [52%] | 0.690a |
| Age [years] | 59 [50-64] |  | 53 [47-60] | 0.060b |
| Weight [kg] | 54.0 [48.0-59.3] |  | 56.5 [48.0-64.8] | 0.220b |
| Height [cm] | 159.5 [155.0-165.0] |  | 159.5 [155.0-168.0] | 0.360b |
| Body mass index [kg/m2] | 20.6 [18.4-23.9] |  | 22.8 [19.6-25.3] | 0.156b |
| Albumin [mg/dL] | 4.15 [3.8-4.4] |  | 4.15 [3.9-4.4] | 0.850b |
| Hemoglobin [g/dL] | 12.2 [10.9-13.2] |  | 12.2 [10.6-12.8] | 0.450b |
| Tumor sites  |  |  |  | 0.954a |
| Esophageal cancer | 14 [32%] |  | 14 [32%] |  |
| Cervical cancer | 10 [23%] |  | 10 [23%] |  |
| Head and neck cancer |  |  |  |  |
| Hypopharynx  | 2 [4%] |  | 3 [7%] |  |
| Nasopharynx  | 9 [20%] |  | 8 [18%] |  |
| Oropharynx  | 6 [14%] |  | 4 [9%] |  |
| Oral | 3 [7%] |  | 5 [11%] |  |
| Tumor grade |  |  |  | 0.240c |
| Well differentiation  | 17 [39%] |  | 17 [39%] |  |
| Moderate differentiation  | 24 [54%] |  | 19 [43%] |  |
| Poor differentiation  | 3 [7%] |  | 8 [18%] |  |
| Tumor stage |  |  |  | 0.930a |
| Stage II | 3 [7%] |  | 3 [7%] |  |
| Stage IIB | 9 [21%] |  | 7 [16%] |  |
| Stage III | 16 [36%] |  | 14 [32%] |  |
| Stage IIIB | 1 [2%] |  | 3 [7%] |  |
| Stage IVA | 11 [25%] |  | 12 [27%] |  |
| Stage IVB | 4 [9%] |  | 5 [11%] |  |
| ECOG performance status |  |  |  | 0.896c |
| 0 | 24 [54%] |  | 22 [50%] |  |
| 1 | 14 [32%] |  | 16 [36%] |  |
| 2 | 6 [14%] |  | 6 [14%] |  |

Abbreviations: ECOG, Eastern Cooperative Oncology Group.

a*P-*value fromFisher’s exact test;b*P-*value from the Mann-Whitney test; c*P-*value fromChi-square test.

**Supplementary Table S2** Factors associated with neutrophil to lymphocyte ratio change over time using generalized estimation equation models in head and neck cancer patients**.**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Univariable Analysis |  | Multivariable Analysis |
| *β* | 95% CI of *β* | *P* |  | adj *β* | 95% CI of adj *β* | *P* |
| Arm |  |  |  |  |  |  |  |  |
|  | Group A [ref.] |  |  |  |  |  |  |  |
|  | Group B | -0.44 | -2.41 to 1.53 | 0.664 |  | -0.81 | -2.62 to 1.00 | 0.382 |
| NLR at pre-CCRT | 0.76 | 0.20 to 1.33 | 0.008 |  | 0.81 | 0.23 to 1.39 | 0.006 |
| Treatment visits of CCRT |  |  |  |  |  |  |  |
|  | Pre-CCRT [ref.] |  |  |  |  |  |  |  |
|  | Mid-CCRT | 6.23 | 4.53 to 7.94 | < 0.001 |  | 6.23 | 4.53 to 7.94 | < 0.001 |
|  | End-CCRT | 7.16 | 5.46 to 8.87 | < 0.001 |  | 7.16 | 5.46 to 8.87 | < 0.001 |
| Tumor site |  |  |  |  |  |  |  |
|  | Oropharynx [ref.] |  |  |  |  |  |  |  |
|  | Hypopharynx  | -2.16 | -5.48 to 1.17 | 0.204 |  | -0.91 | -4.09 to 2.27 | 0.576 |
|  | Nasopharynx  | -0.19 | -2.61 to 2.23 | 0.877 |  | 0.82 | -1.51 to 3.15 | 0.489 |
|  | Oral | 0.44 | -2.44 to 3.32 | 0.764 |  | 1.20 | -1.51 to 3.91 | 0.387 |
| Age [years] | -0.02 | -0.11 to 0.07 | 0.608 |  |  |  |  |
| BMI [kg/m2]  | -0.05 | -0.41 to 0.30 | 0.776 |  |  |  |  |
| Gender |  |  |  |  |  |  |  |
|  | Female [ref.] |  |  |  |  |  |  |  |
|   | Male | 0.53 | -1.51 to 2.56 | 0.612 |  |  |  |  |

Abbreviations: 95% CI, 95% confidence interval; *β*, regression coefficient; adj *β*, adjusted regression coefficient; BMI, body mass index;CCRT, concurrent chemoradiotherapy; NLR, neutrophil to lymphocyte ratio; *P*, *P-*value from the Wald test; ref., reference group.

**Supplementary Table S3** Factors associated with absolute lymphocyte count change over time using generalized estimation equation models in head and neck cancer patients**.**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Univariable analysis |  | Multivariable analysis |
| *β* | 95% CI of *β* | *P* |  | adj *β* | 95% CI of adj *β* | *P* |
| Arm |  |  |  |  |  |  |  |
|  | Group A [ref.] |  |  |  |  |  |  |  |
|  | Group B | -51.11 | -216.51 to 114.30 | 0.545 |  | 32.06 | -49.63 to 113.74 | 0.442 |
| ALC at pre-CCRT | 0.36 | 0.30 to 0.43 | < 0.001 |  | 0.37 | 0.30 to 0.43 | < 0.001 |
| Treatment visits of CCRT |  |  |  |  |  |  |  |
|  | Pre-CCRT [ref.] |  |  |  |  |  |  |  |
|  | Mid-CCRT | -1,350.17 | -1,532.03 to -1,168.30 | < 0.001 |  | -1,350.17 | -1,532.03 to -1,168.30 | < 0.001 |
|  | End-CCRT | -1,568.93 | -1,750.79 to -1,387.06 | < 0.001 |  | -1,568.93 | -1,750.79 to -1,387.06 | < 0.001 |
| Tumor site |  |  |  |  |  |  |  |
|  | Oropharynx [ref.] |  |  |  |  |  |  |  |
|  | Hypopharynx  | 274.02 | 0.20 to 547.83 | 0.050 |  | 89.65 | -51.81 to 231.11 | 0.214 |
|  | Nasopharynx  | 134.91 | -64.32 to 334.14 | 0.184 |  | -21.35 | -124.59 to 81.89 | 0.685 |
|  | Oral | 81.03 | -156.10 to 318.16 | 0.503 |  | -32.43 | -153.78 to 88.92 | 0.600 |
| Age [years] | -0.49 | -7.93 to 6.96 | 0.898 |  |  |  |  |
| BMI [kg/m2] | -8.21 | -37.29 to 20.87 | 0.580 |  |  |  |  |
| Gender |  |  |  |  |  |  |  |
|  | Female [ref.] |  |  |  |  |  |  |  |
|   | Male | -9.34 | -180.93 to 162.24 | 0.915 |  |  |  |  |

Abbreviations: 95% CI, 95% confidence interval; *β*, regression coefficient; adj *β*, adjusted regression coefficient; ALC, absolute lymphocyte count; BMI, body mass index;CCRT, concurrent chemoradiotherapy; *P*, *P-*value from the Wald test; ref., reference group.