AbstractID: 9402 Title: Correlation of White Blood Cell Count with Radiation Therapy Outcome for Cervical Cancer

Purpose/Objective

To assess the impact of circulating white blood cell (WBC) counts during the treatment course for local tumor control in patients treated with radiation therapy (RT) for cervical cancer.

Materials/Methods

Forty-two advanced cervical cancer patients (FIGO stage IB_2-IVA) were studied as a part of IRB-approved protocol. The standard RT for cervical cancer included ~5 weeks of external beam RT, followed by brachytherapy within 3 weeks. Blood tests, including white blood cell counts, were collected approximately once per week longitudinally during the two month RT course. For each patient, the mean (*mWBC*) and median of white blood cell counts were evaluated across the RT course. The outcome endpoints, local (pelvic) tumor recurrence (LR) and death of disease (DOD), were determined by long term patients follow-up 3.9 ~9 years (median 7.5 years). *Cox* proportional hazards model was applied to correlate of WBC parameters with RT outcome. Survival analysis was carried out with *Kaplan-Meier* method.

Results

The parameter *mWBC* correlated with RT outcome including LR (p= 0.004) and DOD (p= 0.032). The median of *mWBC* in patient subgroup with LR (13 patients, median= $6.2\times10^9/\ l$) was higher than that in the subgroup with local tumor control (29 patients, median= $5.5\times10^9/\ l$). *Kaplan-Meier* analysis confirmed higher LR rate of 47% for *mWBC* $>5.4\times10^9/\ l$ versus LR rate of 7% for *mWBC* $< 5.4\times10^9/\ l$ (p= 0.017). The sensitivity, specificity, and accuracy of high *mWBC* to predict LR were 85%, 48%, and 60%, respectively. Correlation of high *mWBC* with higher DOD rate was marginally (p= 0.059).

Conclusions

Our preliminary results suggest that higher white blood cell counts during the course of radiation therapy correlate with higher local tumor recurrence rate. The etiology is unknown, however, may be related to inflammatory changes and tumor necrosis, and requires further investigation e.g. imaging assessment.