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Carbon Ion Radiotherapy for Prostate Cancer; a nationwide survey of the Japan Carbon-ion Radiation Oncology Study Group (J-CROS 1501)

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Introduction of the study; Multi-institutional analysis of the patients with prostate cancer who have received carbon ion radiotherapy (CIRT) as the prospective study in each institute of the Japan Carbon-ion Radiation Oncology Study Group (J-CROS) was carried out.

Methodology; Data of patients enrolled in prospective clinical trials performed at National institute of radiological science, Gunma university heavy ion medical center and Ion beam therapy center, SAGA-HIMAT foundation were retrospectively analyzed. CIRT dose and fractionations were 66-63Gy(RBE)in 20 fractions, 57.6Gy(RBE) in 16 fractions or 51.6Gy(RBE) in 12fractions.All patient risks were reclassified according to the D'Amico risk classification. A short-term (6 months) androgen deprivation therapy (ADT) and a long-term (≥ 24 months) ADT were combined with CIRT for the intermediate-risk group and the high-risk group, respectively. ADT was not combined in low-risk group. The biochemical failure was defined as a rise of >2.0 ng/mL above PSA nadir (Phoenix definition).

Results; Between December 2003 and December 2014, the total number of enrolled patients from all three institutions was 2157. The number of patients in low-risk, intermediate-risk, and high-risk groups were 263, 679, and 1215, respectively. A total of 1754 patients (82%) underwent ADT. The median follow-up periods of surviving patients was 29 months. The five-year biochemical relapse-free survivals (bRFS) in low-risk, intermediate-risk, and high-risk patients were 92%, 89%, and 92%, respectively. The ten-year bRFS in low-risk, intermediate-risk, and high-risk patients were 77%, 70%, and 79%, respectively. The five-year local control rates (LCR) and cause-specific survivals (CSS) in low-risk, intermediate-risk, and high-risk patients were 98%, 96%, and 99% for LCR, respectively, and 100%, 100%, and 99% for CSS, respectively. The incidence of grade (G) 2 and G3 late toxicities were 4.5% and 0% for the bladder, and 0.5% and 0% for the rectum, respectively.

Conclusion; Analysis of the first multi-institutional data on CIRT for prostate cancer suggested that the treatment outcomes of CIRT were favorable, especially in high-risk group patients.

Country

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