POTENTIAL RELATIONSHIP BETWEEN BODY MASS INDEX AND SET-UP CORRECTIONS IN IMAGE GUIDED RADIOTHERAPY FOR PROSTATE CANCER PATIENTS

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AIMS

To investigate the relationship between body mass index (BMI) and intrafraction displacements in patients undergoing prostate cancer image-guided radiotherapy (IGRT).

METHODS

A retrospective analysis was performed using data for ninety-five prostate cancer (Pca) patients who received volumetric arc therapy/image guided (VMAT/IGRT) between January 2017 and April 2018. Body mass index was calculated using the World Health Organization (WHO) definition of the weight (kilograms) divided by the square of the height (meters). Patients were divided in two category: normal or underweight patients, named category 1, had BMI < 25 kg/m^2; overweight patients, named category 2, had BMI ≥ 25 kg/m^2. Setup corrections were determined and corrected using 3D online registrations of CBCT images with the planning CT. The range of displacements in the three space directions was calculated for each patient in centimeters (cm). Mean range of displacements was assessed for each category.
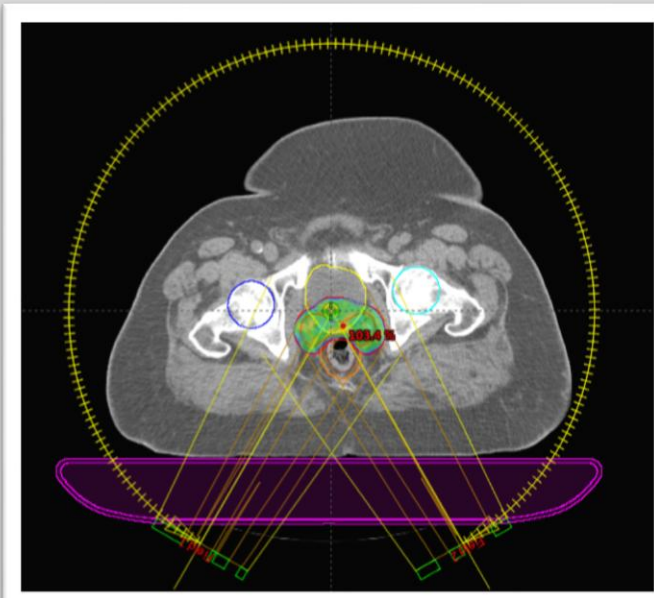
RESULTS

Of the 95 patients, 43% were included to category 1, 57% to category 2. Mean ranges of displacements for category 1 were 1.71 cm, 1.23 cm, 1.17 cm for vertical, longitudinal and lateral directions, respectively. Mean ranges of displacements for category 2 were 1.68 cm, 1.29 cm, 1.55 cm for vertical, longitudinal and lateral directions, respectively. Mean range differences in lateral direction between the two categories resulted statistically significantly with a p-value < 0.05 (p=0.0036).

Mean ranges of displacements
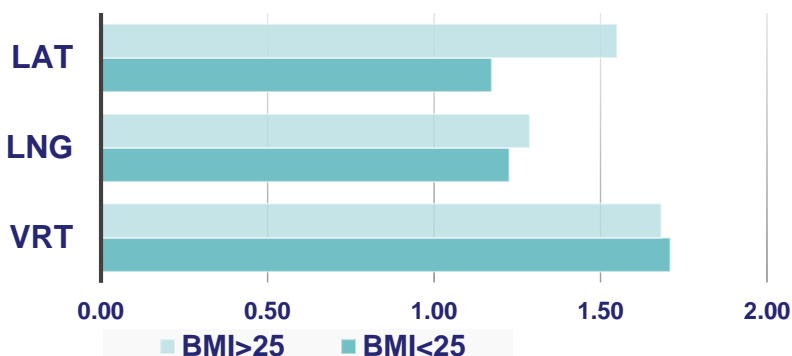
BMI	VRT (cm)	LNG (cm)	LAT (cm)
>25	1.68	1.29	1.55
<25	1.71	1.23	1.17

p-value =0.0036

CONCLUSIONS

Our data indicate that Pca patients with higher BMI had a greater interfraction displacements in the lateral direction compared to patients with a lower BMI. Daily IGRT, especially for these patients, may lead to improve treatment quality.