Purpose:

To evaluate the Patient specific pre-treatment quality assurance for hundred RapidArc plans using semiflex (0.125cc) ionization chambers.

Methods:

Absolute point dose were measured for head and neck, thorax and abdomen cases using semiflex (0.125 cc) ionization chamber. Verification plan was created for each treatment plan in eclipse 8.6 treatment planning system with the semiflex ionization chamber and the octavius phantom. Measurements were performed on a Varian Clinac2100C/D linear accelerator equipped with a millennium 120 leaf collimator. All the results were compared with the fluence measurements using 2D Seven29 ion chamber array combined with octavius phantom.

Results:

Positive absolute mean dose variation of 0.56 % was observed with thorax cases with a standard deviation (SD) of ± 1.13 between the plans with a range of -1.78% to 2.70%. Negative percentage dose errors were found with head and neck and abdomen cases, with a mean variation of -0.43 % (SD ± 1.50), (range -3.25 % to 2.85 %) and -0.35 % (SD ± 1.48), (range -3.10 % to 2.65 %) for head and neck and abdomen cases respectively. Relative dose measurements with 2D array agreed well with the TPS calculate for all the cases. The maximum percentage value failed in gamma analysis was found to be 4.95, 4.75, and 4.88 for head and neck, thorax, and abdomen cases respectively. In all the cases analysed the percentage dose points failed the gamma criteria was less than 5%.

Conclusions:

On the basis of the studies performed it can be concluded that the semiflex ionization chamber having a volume of 0.125cc can be used efficiently for measuring the pre-treatment quality assurance of RapidArc plans for all the sites. The results provide an overall accuracy when compared to fluence measurement done using 2D array seven29.