

ABSTRACT

Computed Tomography (CT) is a primary imaging modality for the detection of kidney stones due to its high spatial resolution. Modern CT systems are equipped with *Automatic Tube Voltage Selection* (ATVS) to optimize radiation dose based on patient characteristics; however, its application in abdominal CT examinations remains inconsistent, particularly in selecting between 90 kV and 110 kV. This study aimed to compare radiation dose and image quality between 90 kV and 110 kV in non-contrast abdominal CT for kidney stone detection. A quantitative analysis was conducted using patient data. Radiation dose parameters included *Computed Tomography Dose Index Volume* (CTDIvol) and *Dose Length Product* (DLP), while image quality was objectively evaluated using Signal-to-Noise Ratio (SNR) and *Contrast-to-Noise Ratio* (CNR) with IndoQCT software. Statistical analysis was performed using the *Shapiro–Wilk* test followed by the *Independent Samples t-test*. The results showed that the use of 90 kV significantly reduced radiation dose, with a decrease in CTDIvol of 2.27 mGy (from 7.56 to 5.29 mGy) and DLP of 102.4 mGy·cm (from 330.75 to 228.35 mGy·cm). Image quality between 90 kV and 110 kV remained comparable, with differences in SNR and CNR of 0.12, showing no statistically significant difference. In conclusion, the use of 90 kV can reduce radiation dose without compromising diagnostic image quality.

Keywords: abdominal CT, tube voltage, radiation dose, image quality.