

## **Abstract**

**Introduction:** Cancer risk associated with ionizing radiation is more important in children. Reducing radiation dose to this age group is much more vital. The aim of this research is to evaluate the effects of kVp and mAs on image quality to find out suitable conditions and ways of reducing dose to this groups of patients when attending for CT examination.

**Materials and Methods:** To evaluate radiation dose to the patients the index of CTDI (Computed Tomography Dose Index) which is recommended by FDA is used. The CTDI were measured in three different phantoms using a pensile ionization chamber (with 10cm active length 3009 PTW-Friburg) in two different types of spiral CT scanner (Shimadzo SCT 7800TE and Philips Tomoscan AVPF). The phantoms were made of Plexiglas with diameters of 8cm for head and body of newborn and 16cm and 24cm for head and body of 5 to 12 years old children (AAPM, 1993). At the center and periphery of the phantoms 5 axial holes were made to fit the chamber during irradiation (one at the center and the other of four one centimeter form the edge of the phantom at equal distances). The effective dose were calculated for every routine CT examination protocol.

**Results:** Maximum effective dose obtained was for newborn chest examination with Shimadzo scanner, when mAs was 80. It was reduced by 56% when mAs was reduced to 50. In this case noise was increased only by 19%. Effective dose in 12 years children was 315% compared with newborn for chest image. For Philips scanner with reduction of kVp form 120 to 100 effective dose reduce by 54% while noise increase only by 7%and contrast reduced by 4%.

**Conclusions:** It is fund that changing the scanner factor reduce effective dose markedly while image quality dose not change.