ABSTRACT

Patients undergoing Iodine-131 (I-131) therapy become sources of radiation exposure to radiation workers, making radiation protection measures essential. lead aprons are commonly used as personal protective equipment; however, their effectiveness during exposure measurements of I-131 therapy patients remains uncertain. This study aimed to evaluate the effectiveness of a 0.5 mm lead apron and compare exposure measurements obtained with and without the apron. The study was conducted in the Radioactive Iodine Ablation Isolation Room (RIRA) of Dr. Kariadi Hospital, Semarang, using two personal dosimeters placed inside and outside the apron during patient exposure measurements. Data were grouped according to patient activity of 30, 35, 50, and 80 mCi, and apron effectiveness was calculated by comparing the recorded doses inside and outside the apron.

The results showed apron effectiveness values of 17.25%, 12.02%, 12.40%, and 23.18% for patient activity of 30, 35, 50, and 80 mCi, respectively. The difference between measurements with and without the apron ranged from 0.32 to 0.77 μSv. These findings indicate that a 0.5 mm lead apron can attenuate only a small portion of the 364 keV gamma radiation emitted by I-131. Therefore, although the use of a lead apron contributes to reducing radiation exposure, optimization of exposure time and distance remains the primary strategy for protecting radiation workers.

Keywords: I-131, Lead Apron, Radiation Protection, Personal Dosimeter, Apron Effectiveness.