عنوان مقاله:

Assessment of patients' entrance skin and effective dose in a mathematical human phantom for the most common interventional radiological examinations

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خلاصه مقاله:

Introduction: Nowadays, we are witnessing an exponential use of interventional radiology techniques in different communities. After CT, interventional techniques are the second factor of increasing patients' doses in different societies. Measuring patient doses from aforementioned methods has been recommended by many radiation protection professional organizations such as ICRP and IAEA. Our aim was to measure/calculate the patients' entrance skin and also necessary parameters required to estimate relevant effective doses for common diagnostic and therapeutic interventional radiology examinations. Materials and Methods: After reviewing and analyzing interventional radiology examination data in an imaging center of a public hospital over ۶ months, five most commonly used examinations, including cholangiography, chemoembolization liver, uterine fibroids embolization, bile duct stenting and coronary angiography and brain embolization were selected for the dose measurements/calculations. For each examination, ۵۰ patients were selected and their skin doses were measured using TLDs. Effective doses resulted from these examinations were also calculated by using the Monte Carlo based PCXMC software for an average human phantom. Results: The average entrance skin dose measured for the patients undergoing cholangiography, chemoembolization liver, uterine fibroids embolization, bile duct stenting and coronary angiography and brain embolization examinations were: ۵۷, ۱۴۱, ۴۴۷, ۲۴۱, ۵۸۷ mGy and their estimated effective doses were ۳.۵,۱۱, ۳۱, ۱۵.۵, ۱۰ mSv respectively. As expected, the patient doses in interventional radiology examinations varied, since the amount of doses depends on many factors including the complexity and difficulty of interventional procedures, operators' experience and skill, and patients' weight. Conclusion: In interventional radiology examinations a small field of view is used. Hence, appropriate voltage potentials and pulse durations must be used to reduce effective doses while achieving highest image qualities (resolution, contrast-to-noise ratio, and signal to noise ratio).

کلمات کلیدی: