Investigation on Scattered Dose Rate and Exposure Parameters during Diagnostic Examination Done with an Overcouch X-Ray Tube in Nigerian Teaching Hospital

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Abstract : The aims of this research are to measure the scattered dose rate during an X-ray examination in an X-ray room, compare the scattered dose rate with exposure parameters based on the body region examined, and examine the X-ray examination done with an over couch tube. The research was carried out using Gamma Scout software installation on the computer system (Laptop) to record the radiation counts, pulse rate, and dose rate. The measurement was employed by placing the detector at 900 to the incident X-ray. Proforma was used for the collection of patients' data such as age, sex, examination type, and initial diagnosis. Data such as focus skin distance (FSD), body mass index (BMI), body thickness of the patients, the beam output (kVp) were collected at Obafemi Awolowo University, Ile-Ife, Western Nigeria. Total number of 136 patients was considered during this research. Dose rate range between 14.21 and 86.78 µSv/h for the plain abdominal region, 85.70 and 2.86 µSv/h for the lumbosacral region,1.3 µSv/yr and 3.6 µSv/yr in the pelvis region, 2.71 µSv/yr and 28.88 µSv/yr for leg region, 3.06 µSv/yr and 29.98 µSv/yr in hand region. The results of this study were compared with those of other studies carried out in other countries. The findings of this study indicated that the number of exposure parameters selected for each diagnostic examination contributed to the dose rate recorded. Therefore, these results call for a quality assurance program (QAP) in diagnostic X-ray units in Nigerian hospitals.
Keywords : X-radiation, exposure parameters, dose rate, pulse rate, number of counts, tube current, tube potential, diagnostic examination, scattered radiation
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