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'Evaluating Radiation Protections Aspects For Pediatric Chest Radiography: imaging Standards and Radiation Dose Measurements in Various Hospitals In Kuwait

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Abstract : Chest radiography (CXR) is one of the most important diagnostic examinations in pediatric radiography for diagnosing various diseases. Since, chest X-ray use ionizing radiation to obtain image radiographers should follow strict radiation protection strategies and ALARA principle to ensure that pediatrics receive the lowest dose possible [1] [2]. The aim is to evaluate different criteria related to pediatric CXR examinations performed in the radiology department in five hospitals in Kuwait. Methods: Data collected from a questionnaire and Entrance Skin Dose (ESD) measurements during CXR. 100 responses were collected and analyzed to highlight issues related to immobilization devices, radiation protection issues and repeat rate. While ThermoLumenince Dosimeters (TLDs) measured ESD during 25 CXR for pediatric patients. In addition, other aspects on the radiographer skills and information written in patient requests were collected and recorded. Results: Questionnaires responses showed that most radiographers do follow most radiation protection guidelines, but need to focus on improving their skills in collimation to ROI, dealing with immobilization tools and exposure factors. Since the first issue was least applied to young pediatrics, and the latter two were the common reasons for repeating an image. The ESD measurements revealed that the averaged dose involved in pediatric CXR is 143.9 µGy, which is relatively high but still within the limits of the recommended values [2-3] . The data suggests that this relatively high ESD values can be the result of using higher mAs and thus it I recommended to lower it according to ALARA principle. In conclusion, radiographers have the knowledge and the tools to reduce the radiation dose to pediatric patients but few lack the skills to optimize the collimation, immobilization application and exposure factors. The ESD were within recommended values. This research recommends that more efforts in the future should focus on improving the radiographer commitment to radiation protection and their skills in dealing with pediatric patient. This involves lowering the mAs used during DR.

Keywords : pediatric radiography, dosimetry, ESD measurements, radiation protection
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