World Academy of Science, Engineering and Technology
International Journal of Health and Medical Engineering
Vol:18, No:07, 2024

Radiation Risks for Nurses: The Unrecognized Consequences of ERCP Procedures

Authors : Ava Zarif Sanayei, Sedigheh Sina

Abstract : Despite the advancement of radiation-free interventions in the gastrointestinal and hepatobiliary fields, endoscopy and endoscopic retrograde cholangiopancreatography (ERCP) remain indispensable procedures that necessitate radiation exposure. ERCP, in particular, relies heavily on radiation-guided imaging to ensure precise delivery of therapy. Meanwhile, interventional radiology (IR) procedures also utilize imaging modalities like X-rays and CT scans to guide therapy, often under local anesthesia via small needle insertion. However, the complexity of these procedures raises concerns about radiation exposure to healthcare professionals, including nurses, who play a crucial role in these interventions. This study aims to assess the radiation exposure to the hands and fingers of nurses 1 and 2, who are directly involved in ERCP procedures utilizing (TLD-100) dosimeters at the Gastrointestinal Endoscopy department of a clinic in Shiraz, Iran. The dosimeters were initially calibrated using various phantoms and then a group was prepared and used over a two-month period. For personal equivalent dose measurement, two TLD chips were mounted on a finger ring to monitor exposure to the hands and fingers. Upon completion of the monitoring period, the TLDs were analyzed using a TLD reader, showing that Nurse 1 received an equivalent dose of 298.26 µSv and Nurse 2 received an equivalent dose of 195.39 µSv. The investigation revealed that the total radiation exposure to the nurses did not exceed the annual limit for occupational exposure. Nevertheless, it is essential to prioritize radiation protection measures to prevent potential harm. The study showed that positioning staff members and placing two nurses in a specific location contributed to somehow equal doses. To reduce exposure further, we suggest providing education and training on radiation safety principles, particularly for technologists.

Keywords : dose measurement, ERCP, interventional radiology, medical imaging
Conference Title : ICRMI 2024 : International Conference on Radiology and Medical Imaging
Conference Location : Corfu, Greece
Conference Dates : July 04-05, 2024