ONCODAILY MEDICAL JOURNAL

abstract

Evaluation of Organ Doses and Lifetime Attributable Cancer Risk in F-18 FDG PET/CT for Lymphoma Patients: Experience from Sultan Qaboos University Hospital

Amal Alhajji, Amani Almaqbali, Amna Aljabri, Jawa Zabah, Saleh Baawain, Yassine Bouchareb

DOI: 10.69690/ODMJ-018-3101-6618

AMSTRO
Asia and Middle East Society of Therapeutic Radiation and Oncology
Affiliated with ASTF

Asia and Middle East Society for Radiation Therapy and Oncology, 2026

abstract

Evaluation of Organ Doses and Lifetime Attributable Cancer Risk in F-18 FDG PET/CT for Lymphoma Patients: Experience from Sultan Qaboos University Hospital

Authors: Amal Alhajji, Amani Almaqbali, Amna Aljabri, Jawa Zabah, Saleh Baawain, Yassine Bouchareb

Affiliation: Department of Radiology and Molecular Imaging, Sultan Qaboos University Hospital, Muscat, Oman

DOI: 10.69690/ODMJ-018-3101-6618

Introduction: Whole-body F18-FDG – PET/CT is an essential imaging modality in lymphoma management, enabling accurate diagnosis, staging, and assessment of therapy response. Despite its significant clinical value, PET/CT exposes patients to ionizing radiation from both the radiopharmaceutical and CT components. Quantifying organ absorbed doses and assessing lifetime attributable cancer risk (LAR) are critical for optimizing imaging protocols and ensuring patient safety. This study aimed to evaluate organ absorbed doses, effective dose (ED), and age- and gender-specific LAR in adult lymphoma patients undergoing whole-body F18-FDG – PET/CT imaging.

Methodology: A total of 155 adult lymphoma patients (66 females and 89 males) were retrospectively included from Sultan Qaboos University Hospital, University Medical City. All patients underwent a single whole-body F18-FDG-PET/CT scan, with a mean administered activity of 350 MBq (±10%). Organ absorbed doses were estimated based on patient-specific PET and CT acquisition parameters. The effective dose was calculated according to ICRP Publication 103 tissue-weighting factors. Age- and gender-specific LAR values were determined using BEIR VII risk models to evaluate organ- and demographic-specific cancer risks.

Results: The mean effective dose from combined F18-FDG – PET/CT was 6.43 mSv for females and 6.34 mSv for males. The organs receiving the highest absorbed doses were the bladder wall, heart wall, and brain, with mean doses of 43.64, 20.90, and 9.88 mGy in females, compared to 32.41, 17.33, and 8.91 mGy in males, respectively. LAR analysis demonstrated age- and gender-related dependence, with younger adults exhibiting higher predicted cancer risks. The bladder wall and heart wall showed the highest estimated LAR values, reaching 0.072% in females versus 0.024% in males for the bladder wall, and 0.035% versus 0.027% for the heart wall.

Conclusion: Whole-body F18-FDG – PET/CT in lymphoma patients delivers measurable radiation

doses that vary according to age and gender, influencing estimated lifetime cancer risk. These findings emphasize the importance of individualized dose assessment, protocol optimization, and risk-informed clinical decision-making to enhance patient radiation protection.

Conflict of interests: The authors declare no conflict of interests.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.