



انجمن نوزاد و سرطان کودکان ایران
Iranian Pediatric Hematology and Oncology Society



دانشگاه علوم پزشکی مشهد

Reevaluation of Pulmonary Function in Radiotherapy-Treated children with Sarcoma

Alireza eshghi

Department of pediatric pulmonology, aliasghar children's hospital, school of medicine, iran university of medical sciences, tehran, iran



Abstract:

Background: Sarcomas are malignant tumors of mesenchymal origin that often require multimodal treatment, including surgery, chemotherapy, and radiotherapy. When radiotherapy involves the thoracic region, pulmonary toxicity becomes a significant clinical concern. This study aims to reevaluate pulmonary function in sarcoma patients following thoracic or nearby-field radiotherapy.

Methods:

A retrospective review was conducted on patients diagnosed with sarcoma who underwent radiotherapy involving thoracic structures. Pulmonary function tests (PFTs), including forced vital capacity (FVC), forced expiratory volume in 1 second (FEV₁), and diffusing capacity of the lungs for carbon monoxide (DLCO), were collected pre- and post-treatment. Statistical analysis was used to determine correlations between radiation dose, field size, and changes in PFTs.

Results:

Post-radiotherapy evaluations demonstrated a statistically significant decrease in FVC and FEV₁ ($P < 0.05$) in approximately 40% of patients. Furthermore, DLCO was markedly reduced in patients receiving higher cumulative doses ($GY > 50$), consistent with radiation-induced interstitial pneumonitis or microvascular injury. The extent of functional impairment correlated strongly with the size of the radiation field and total lung volume irradiated.

Conclusion:

Radiotherapy in sarcoma patients can result in measurable pulmonary dysfunction, particularly when thoracic exposure is substantial. Monitoring lung function through serial PFTs and applying lung-sparing radiotherapy techniques, such as intensity-modulated radiation therapy (IMRT) or proton therapy, may reduce the risk of long-term pulmonary complications.

Keywords: Sarcoma, Radiotherapy, pulmonary function test

