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Radiation Exposure Levels in Vascular Access Interventions by Interventional Nephrologists

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Objectives : Radiation exposure is a significant concern in AV access interventions, where procedures often involve ionizing radiation-emitting imaging devices such as x-rays and fluoroscopy, with potential health risks, including an increased risk of cancer. This abstract highlights the critical role of interventional nephrologists in protecting the well-being of patients and healthcare workers while maintaining public confidence in endovascular procedures. Adherence to established safety guidelines, use of protective equipment, and staying abreast of radiation reduction technologies are essential practices. These measures not only prioritize safety, but also strengthen public confidence in the medical field.

Methods : In the year 2024, 1501 endovascular interventions were performed at the Lifeline Clinic for AV access dysfunction. The Dose-Area-Product (DAP) value of radiation generated during the procedure was measured. The values were then compared with data published by the Korea Centers for Disease Control and Prevention (KCDC) and the Korean Society of Interventional Radiology (KSIR) in 2020.

Results : In our analysis of 1,501 cases, the mean DAP (Dose-Area Product) value was found to be 7.04 Gy·cm², which is lower compared to the mean DAP value of 13.4 Gy·cm² observed in the 473 cases from the comparison group (KCDC & KSIR). This was analyzed using the bootstrap method, and the results were found to be statistically significant. These procedures were safely and effectively carried out, and 1500 cases(99.93%) achieved technical success. In our subgroup analysis, the VA occlusion group has higher DAP values at all percentiles compared to the non-VA occlusion group, which is likely due to the greater difficulty of intervention for VA occlusion.

Conclusions : In conclusion, the treatment of vascular access by a trained interventional nephrologist is both safe and effective.

table 1.png

Group	n	Mean DAP	DAP 25%	DAP 50%	DAP 75%	DAP 93%
All	1501	7.04	3.15	5.12	8.57	16.56
VA Occlusion	349	9.04	4.56	6.55	11.26	19.40
Non-VA Occlusion	1152	6.43	2.83	4.68	7.97	14.85
KSDC & KSIR	473	13.40	2.90	5.80	12.30	36.60