Abstract:

Background: Advances in medical imaging and interventional procedures have been associated with increased exposure to ionizing radiation. Thus, the International Commission on Radiological Protection (ICRP) established uniform safety standards to protect the general public against the dangers arising from ionizing radiations. In Europe, the ICRP standards are listed in the European Directive 2013/59/EURATOM, which should be transposed into national legislation by member states. They require that the administered dose must be part of the radiological report and identify the practitioners’ responsibilities in justifying and optimizing the dose and correctly informing the patient. Despite these indications, the literature lacks information about the dose from fluoroscopically inserted dialysis tunneled central venous catheters (td-CVC). This study aimed to quantify the effective dose and organ dose to relevant organs in td-CVC to comply with the EU statements.

Methods: We revised fluoroscopically-guided procedures of td-CVC insertion, considering dose per area product, fluoroscopic time, effective dose, organ dose, and anatomical district. We also compared these parameters with those of fluoroscopically inserted oncological central venous devices (Port-a-cath).

Results: The dose-area product, fluoroscopic time, and organ dose for td-CVC were 13 ± 22.2 Gy*cm², 81 ± 129 s, and 1.9 ± 3.3 mSv. The radiological parameters for the left internal jugular, subclavian and femoral veins were similar but higher than for the right internal jugular vein. The radiological parameters were significantly higher for td-CVC than for Port-a-cath.

Conclusions: Fluoroscopically inserted td-CVC are associated with a relatively low dose of ionizing radiation, with considerable variability due to the anatomical puncture site and previous accesses’ history. In light of the European Directive, it is a concern for nephrologists to be aware of the administered ionizing dose to comply with their legal responsibilities.

Reference: