Contribution ID: **34** Type: **Oral**

Kerma - effective dose factor of the eye of pediatric patient during intra-arterial chemotherapy

Friday 28 October 2022 13:55 (10 minutes)

Purpose:
Retinoblastoma is a rare eye tumor that develops in children up to 4 years old. Intra-arterial chemotherapy (IAC) is an emerging treatment modality that is gaining recognition worldwide. IAC requires fluoroscopy assistance, which involves multiple irradiations. As consequence, children undergoing IAC can sustain damage to eye lens such as cataracts and radiation induced cancer.
The aim of the project was to find correction factors between the air Kerma at the reference point and the eye lens dose.

Methods:
Retinoblastoma procedures performed between May 2021 and June 2022 with C-arm system (Philips Allura-Xper, FD20/20) were reviewed. Patient's characteristics (age, sex, head size) and radiation exposure parameters (Kerma, table height) were collected. Effective doses were measured using thermoluminescent detectors (TLD) placed on both eyes and temples. For this study, two correction factors were calculated: the ratio of the effective dose (ED) measured by the TLDs to the total Kerma (Ktot) found on the dose report, and the ratio of the ED to the corrected Kerma (Kcor), which takes into account the table height and patient's thickness.

Results:
The study included 23 retinoblastoma procedures in 20 patients. The median ratio between the dose to the right and left eyes and Ktot was 0.12 and 0.33, respectively, whilst the ratio of Kcor was 0.22 and 0.53. The correction factor using Kcor is respectively 83% and 60% higher than that of Ktot. In addition, results show that the median ED is 1.96 times higher for the left eye than for the right eye.

Conclusion:
This study shows the existing bias between the dose estimated from Ktot and the Kerma at the eye level. The right and left eye doses can now be estimated directly from the Kerma obtained either on the dose report, or more accurately, from the radiation dose structured report. In addition, results highlight that the left eye receives two times more dose than the right eye due to the machine configuration. This could be optimized with a biplane tube changing sides.

Authors: Mrs DERCOURT, Marion; GALLEGO MANZANO, Lucia (CHUV - Centre hospitalier universitaire vaudois); NOWAK, Marie (CHUV - Centre hospitalier universitaire vaudois)

Presenter: Mrs DERCOURT, Marion

Session Classification: Session IV: Radioprotection, Treatment Techniques

Track Classification: Radioprotection