



Thoughts on “Estimation of radiation exposure of children undergoing superselective, intra-arterial chemotherapy for retinoblastoma treatment: Assessment of Local Diagnostic Reference Levels as a function of age, sex and interventional success”

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Dear Editor,

We would like to thank the authors of the “Letter to the Editor” concerning our manuscript “Estimation of radiation exposure of children undergoing superselective intra-arterial chemotherapy for retinoblastoma treatment: Assessment of Local Diagnostic Reference Levels as a function of age, sex and interventional success” [1] for their feedback in this important and exciting field of research.

The principle aim of our study was to establish pediatric diagnostic reference levels (DRLs) for intra-arterial chemotherapy (IAC) procedures. We absolutely agree with the authors that pediatric DRLs for IAC procedures will increase dose awareness, and in the long term, optimize the modification of equipment, technique, and imaging parameters. Also, the International Commission on Radiological Protection (ICRP) and the European Guidelines on Diagnostic Reference Levels for Paediatric Imaging are proclaiming the necessity for DRLs for pediatric patients [2, 3], so work like ours may probably contribute to the establishment of DRLs in IAC.

In the European Guidelines on Diagnostic Reference Levels for Paediatric Imaging in cranial examinations, age is recommended as the grouping parameter [3].

For this reason, we determined the DAP and fluoroscopy time values according to the recommended age groups. Since no alternative routes through the external carotid artery were probed for drug administration in our patients, it did not make sense for us to divide the procedure into distinct phases. This deliberate approach pursued in our center is described in detail by Stenzel et al. [4].

We read with great interest the authors’ work [5, 6]. In contrast to our colleagues, we did not determine absolute dose values with anthropomorphic phantoms, but concentrated ourselves on the DRLs which are based on the DRLs for other interventional radiological procedures published by the Federal Office for Radiation Protection in Germany [7]. Contrary to phantom measurements, DRLs are a practical and feasible way of radiation exposure comparison of different devices at different sites in the clinical routine.

In conclusion, we can only welcome a lively discussion on this topic highlighting the necessity of radiation dose awareness, hopefully leading to further dose optimization.

This letter is a response to the original article <https://doi.org/10.1007/s00234-020-02540-7> and the original Letter <https://doi.org/10.1007/s00234-020-02587-6>.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in the studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent For this type of retrospective study formal consent is not required and all patient data was anonymized.

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References

- Opitz M, Bos D, Deuschl C et al (2020) Estimation of radiation exposure of children undergoing superselective intra-arterial chemotherapy for retinoblastoma treatment: assessment of local diagnostic reference levels as a function of age, sex, and interventional success. *Neuroradiology*. <https://doi.org/10.1007/s00234-020-02540-7>
- Khong P-L, Ringertz H, Donoghue V et al (2013) ICRP Publication 121: Radiological protection in paediatric diagnostic and interventional radiology. *Ann ICRP*. <https://doi.org/10.1016/j.icrp.2012.10.001>
- European Union (2018) Radiation Protection (No. 185), European Guidelines on Diagnostic Reference Levels for Paediatric Imaging. http://www.eurosafeimaging.org/wp/wp-content/uploads/2018/09/rp_185.pdf. Accessed 21 Jul 2020
- Stenzel E, Göricke S, Temming P et al (2019) Feasibility of intra-arterial chemotherapy for retinoblastoma: experiences in a large single center cohort study. *Neuroradiology*. <https://doi.org/10.1007/s00234-019-02153-9>
- Guasti A, Leonini S, Bertelli E et al (2019) Intra-arterial chemotherapy for retinoblastoma: the dosimetric impact. *Neuroradiology*. <https://doi.org/10.1007/s00234-019-02260-7>
- Bertelli E, Leonini S, Galimberti D et al (2016) Hemodynamic and anatomic variations require an adaptable approach during intra-arterial chemotherapy for intraocular retinoblastoma: alternative routes, strategies, and follow-up. *Am J Neuroradiol*. <https://doi.org/10.3174/ajnr.A4741>
- Schegegerer A (2016) Bekanntmachung der aktualisierten diagnostischen Referenzwerte für diagnostische und interventionelle Röntgenanwendungen. In: 22.06.2016. https://www.bfs.de/SharedDocs/Downloads/Bfs/DE/fachinfo/ion/drw-roentgen.pdf;jsessionid=0BD98D36DE5D140979B170650F31DA88.2_cid382?__blob=publicationFile&v=9. Accessed 1 Oct 2020

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