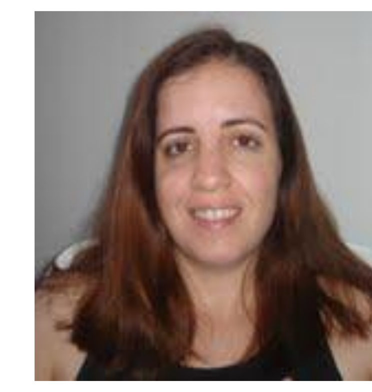
Pediatric exposition in hemodynamics services in the state of Bahia, Brazil



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1- INTRODUCTION

Interventional radiology, due to long-term exposure and the great number of acquired images, is currently considered to be the radiology practice with the largest medical and occupational exposures. For this reason, there is the possibility of deterministic effects in addition to stochastic ones, for example serious radioinduced lesions, erythema, epilation, necrosis and cancer, among others [1] . The number of invasive procedures used in pediatric interventional radiology has increased in recent years, requiring the knowledge of the exposures for evaluation of risk of these effects. In this sense, our objective was to investigate pediatric medical exposures in interventional procedures in two hospitals in Salvador, Bahia.

2 - MATERIALS AND METHODS

The procedures were categorised by medical specialty in cardiological procedures and neurological procedures.

In the statistical analysis, the mean, median and range were calculated, using the distribution of incident air kerma and air kerma area product (P_{KA}) (table 2).

For the purpose of comparison with reference levels for adults, we calculated the third quartile of incident air kerma and of the P_{KA} and compared them to the paediatric procedures.

The verified parameters were incident air kerma, air kerma area product, tube voltage, exposure time, half-value layer, filtration, spatial resolution, high contrast resolution, low contrast resolution, dynamic range and field size. The values represented in this work were obtained after verifying the conformity of performance for the equipment.

For the performance evaluation of the equipment, the measure of P_{KA} of the Iba dosimetry manufacturer, model KermaX – Plus DDP, the multimeasurer model RAPIDOSE of the Radcal manufacturer and the simulators Fluke 76-710 and CIRS NEMA XR21(13) were utilised.

3 - RESULTS AND DISCUSSION

It was evaluated eighteen procedures (14 cardiac procedures and 4 brain procedures), two hospitals and four equipment.

The age range was from 0 to 14 years and its distribution showed that 27.8% of patients were in the range from 0 to 1 year, 22.2% in the range 1 -10 years and 50% of patients had more than 10 years (table 1).

Table 1: Distribution of age per group of procedures.

Procedures	0 - 1 years	2 - 10 years	11 - 14 years
Neurological	1	0	3
Cardiological	4	4	6

In all age groups, it attended patients undergoing cardiac procedures, while there was no occurrence of brain procedures in the range 1 to 10 years.

Table 2: Mean, median, range data and third quartile of P_{KA} (mGy.cm^2) and incident air kerma (mGy) for cardiological and neurological procedures.

	Cardiological		Neurological	
	P_{KA}	Kerma	P_{KA}	Kerma
Mean	46141.9	420.1	15712.5	602.9
Median	34080.0	475.1	15712.5	601.0
Third quartile	64200.0	489.9	8083.4	687.9
Range	3792.0 – 129920.0	23.5 – 947.0	6415.0 – 25010.0	248.5 – 961.0

The doses obtained in this study are close to the values obtained in recent studies[1,2] and show that for cardiac procedures exposures are close to reference levels for adults, indicating the need to establish diagnostic reference levels for pediatric patients and optimization for reducing exposures of those patients.

4 - CONCLUSIONS

The results of this study show the necessity to optimise practices in interventional radiology in paediatrics. The characteristics of the child population, such as the complexity of the cases, the gauge of blood vessels and difficulties in immobilisation, explain the fact that the doses are in line with the reference levels for adults.

These results are the first from the state of Bahia representing an advance in the direction of an optimisation policy of for paediatric practices in interventional radiology.

5 -REFERENCES

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Agradecimentos