

Radiation Protection in Paediatric Interventional Cardiology in Latin America. Advances of the Regional IAEA program.

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1. INTRODUCTION

Children undergoing interventional cardiology (IC) procedures, require special attention due to their higher radiosensitivity, which gives a higher probability of cancer when compared with adult patients. The pediatric IC procedures in the regions of Latin America and the Caribbean are performed by medical specialists in pediatric cardiology, who do not often have specific training in radiology imaging and radiation protection (RP). Moreover, modern X-ray systems used in pediatric IC are complex to operate because of their numerous setting options and operational modes. The International Atomic Energy Agency (IAEA), aware of the situation in Latin America and the Caribbean, has implemented a technical cooperation project entitled "Ensuring Radiological Protection of patients during medical exposures (TSA3), RLA/9/067".

2. OBJECTIVES

The aim of this work is to present the advances of the pilot program on RP in paediatric interventional cardiology launched by the International Atomic Energy Agency in Latin America in 2010.

3. MATERIAL AND METHODS

The pilot program in RP started with a workshop, made in May 2010 at the Luis Calvo Mackenna Hospital in Santiago de Chile. During this workshop, a radiation protection course was imparted to 15 senior interventional cardiologists from 11 Latin American Countries.

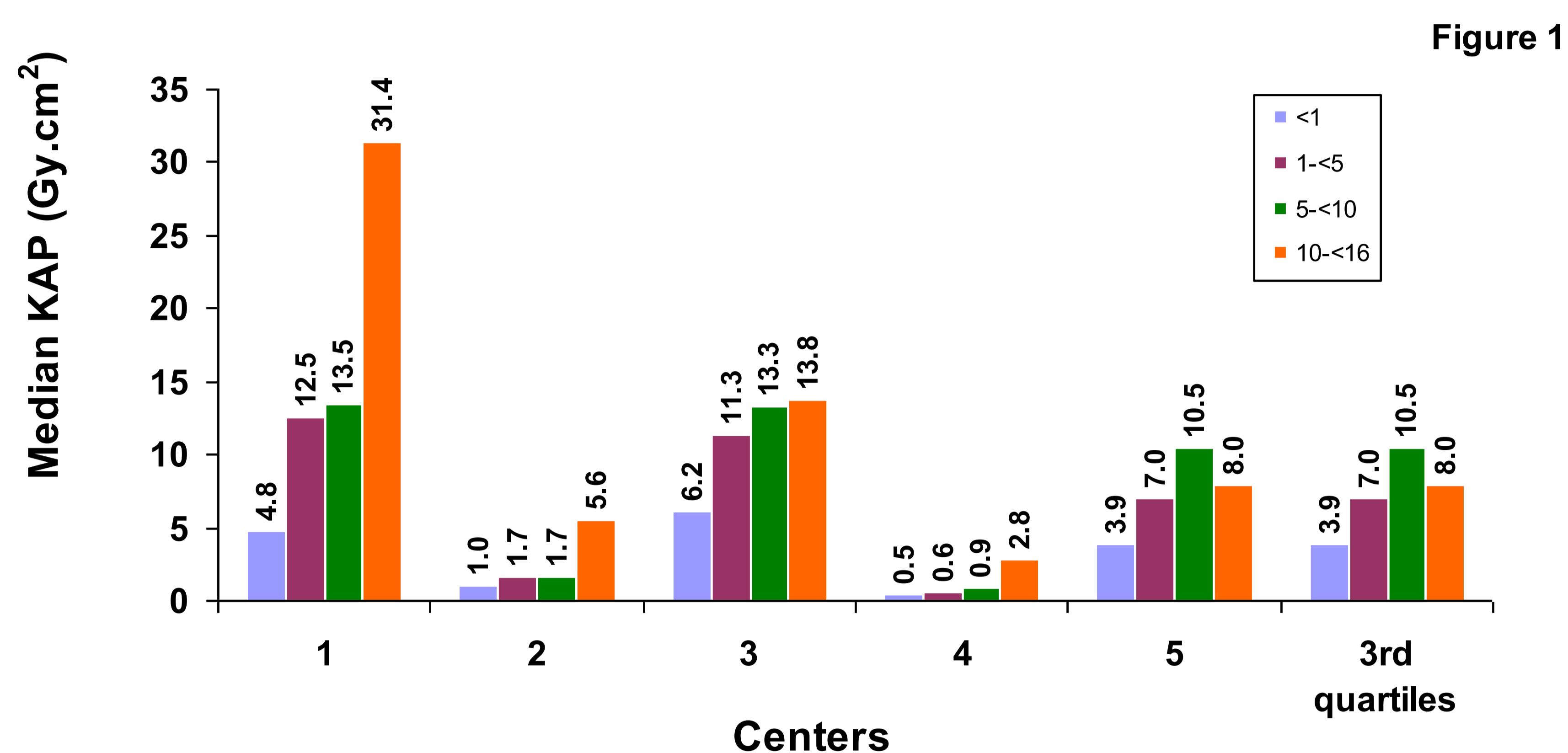
The training was carried out over two and a half days with a total of 17 hours of lecturing (including practical and discussion sessions) and partly followed the same pattern as other previous IAEA training activities.



The program objectives and the methodology to collect and process data on patient and staff radiation doses were agreed during a workshop with paediatric cardiologists from 11 Latin American countries. Special attention was given to agree on a common quality control protocol for the X-ray and imaging systems, dosimetric parameters to be collected and a list of the most common procedures.

4. RESULTS AND DISCUSSION

Figure 1 shows the results of the median kerma area product (KAP) values for all age bands and centers participating in the study.



These values could be used as initial diagnostic reference levels to be refined during the IAEA program.

Table 1 presents a comparison of these initial results with others from recent published papers.

Table 1. Comparison between median KAP for pediatric cardiology reported in this work and by others (figures adapted by the authors of this paper).

Age bands (years)	Boothroyd <i>et al</i> 1997 (Gy.cm ²)	Rassow <i>et al</i> 2000 (Gy.cm ²)	Bacher <i>et al</i> 2005 (Gy.cm ²)	Martinez <i>et al</i> 2007 (Gy.cm ²)	Vano <i>et al</i> 2011 (Gy.cm ²)	This paper 2012 (Gy.cm ²)
<1	12	3		1.9	3.6	3.3
1 - <5	24	5	4.1	2.9	8.8	6.6
5 - <10	48	10		4.5	15	8
10-<15	98	18		15.4	23	13.3

In this summary of the median values of KAP, the values of our survey are in the low range of other published surveys with the initial sample of centers involved but the situation could be different when a larger sample will be available.

5. CONCLUSIONS

This international action was designed to promote the radiation protection culture in pediatric interventional cardiology in Latin America, establishing the need to implement quality control periodically, as well as the collection and analysis of patient dose values. The initial diagnostic reference levels estimated from the median KAP value for four Latin American countries to the four age bands were, 3.9 Gy.cm² (<1 y), 7 Gy.cm² (1 - <5 y), 10.5 Gy.cm² (5 - <10 y) and 8 Gy.cm² (10-<16 y), respectively.

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