

RISK MANAGEMENT OF THE RADIATION-INDUCED CATARACT

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INTRODUCTION

The Council Directive 2013/59/EURATOM of 5 December 2013 [1], following the new ICRP guidance [2], established a considerable reduction on the limit for equivalent dose for the lens of the eye in occupational exposure, from 150mSv to 20mSv in a single year. That requires from the Radiation Protection and Prevention Units of the hospitals a new method to evaluate the risk of cataract in exposed professionals and a new guideline to assign PPEs (Personal Protective Equipment) such as lead glasses. The purpose of this work is to propose a method for this task.

MATERIALS AND METHODS

Our Company, GESTISA, leads the “Crystalline Project” [3], manufacturing a new eye lens dosimeter and starting a pilot program with 15 hospitals in Spain, in order to collect data about the accumulated doses in 12 selected medical specialties.

Each of the hospitals has participated in the project with a different number of professionals (including doctors, nurses, medical imaging technologists and nursing assistants) during a minimum period of 3 months in a total of 15 months that the project has been running so far.

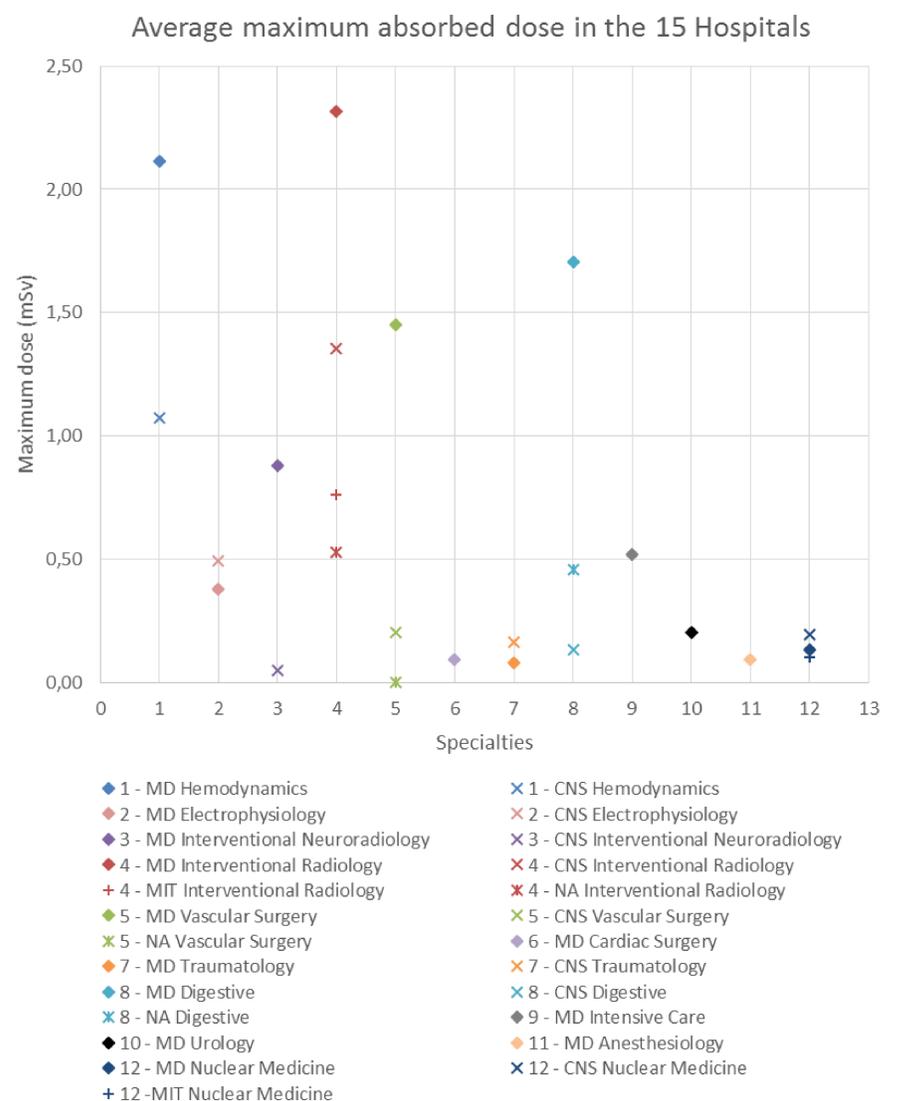
The dosimeters used for the study were those designed by GESTISA for that purpose, based on the DOSES™ model created and patented by this entity for patient dosimetry, but properly calibrated in the magnitude Hp (3). They consist on a lightweight device that is included in a protective case that attaches to the front of the surgery hat of the user, in order to reproduce the distance and orientation of the eye-lens without interfering with his/her work. If the user works in more than one installation, he/she must carry a different dosimeter in each of them.

The eye lens dosimeter should only be used during the interventional processes. The rest of the time must be kept by each professional in the box that accompanies it. Nevertheless, a recommendation was given, that the operating room assistants should keep track of the dosimeters that enter and leave the room.

The dosimeters were sent to each hospital to be used during one month. After this period, they were collected for GESTISA to read and record the doses, after replacement by blank dosimeters, for the following month. Also, each hospital received a dosimetry report with the results from the previous month.

RESULTS

The results for the average acquired dose per specialty are shown in the following graphic.



CONCLUSIONS

Our recommendations[4], on whether a certain medical specialty should wear led glasses or dosimeter, were based on the Spanish Royal Decree 783/2001[5] that imposes the obligation of wearing a dosimeter in Controlled Zones, that is, the areas where there exists the possibility of reaching doses of more than 3/10 of the annual occupational limit for the lens of the eye.

According to this, every professional that can reach the limit of 6mSv/year, that is 0.5mSv/month, should wear an eye lens dosimeter. If we have a look at the results, we find that those specialties are: Hemodynamics, Interventional Neuroradiology, Interventional Radiology, Vascular Surgery, Gastroenterology and Intensive Care.

To make a recommendation on the use of lead glasses, we considered the limit of 1.67mSv/month (that would make 20mSv/year), so the resulting specialties were Hemodynamics, Interventional Radiology, and Gastroenterology.

REFERENCES

- [1] COUNCIL DIRECTIVE 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation.
- [2] ICRP Publication 103 Ann. ICRP 37 (2-4), 2007
- [3] <http://www.crystallineproject.eu/en/>
- [4] *Gestión Preventiva de la catarata radioinducida en radiología médica*, L. Corpas Rivera, M.V. Marfil Robles, XI Congreso Nacional de Prevención de Riesgos Laborales en el Ámbito Sanitario, H.U. 12 de Octubre, Madrid
- [5] Spanish Royal Decree 783/2001, of the 6th of July, which approves the Regulation on Sanitary Protection against Ionizing Radiations.