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Eye lens radiation exposure in Greek interventional cardiology personnel

Introduction (1)

- *Eye lens:*

- Tissue with high radiosensitivity in the human body
- Exposure to ionizing radiation \Rightarrow radiation-induced cataract risk
- Occupational annual dose limit (ICRP) = 20mSv from 150mSv
- High occupational ocular doses \Rightarrow Interventional Cardiologists
- Reduction of ocular doses \Rightarrow radioprotective lead glasses

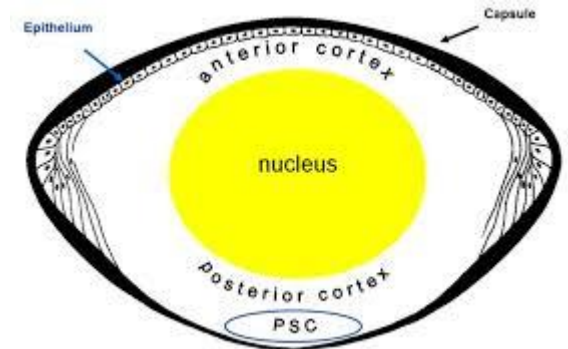


Introduction (2)

- ***Radiation-induced cataract:***

1. Nuclear
2. Cortical
3. Posterior subcapsular

(most associated with radiation-induced cataract)



- ***Grading with Lens Opacities Classification System (LOCS) III***



Comparison of eye examination images with reference photographs

Methods (1)

44 Interventional Cardiologists (ICs) from Athens > 40 years old
with more than 4 years experience



Epidemiological/Medical + Occupational questionnaires
developed within the ELDO project



Slit-lamp + Scheimpflug eye examinations



LOCS III grading of lens opacities



Eye dosimeters for the eye doses evaluation



Methods (2)

22 unexposed (control group) to radiation individuals
> 40 years old



Epidemiological/Medical questionnaire



Slit-lamp + Scheimpflug eye examinations



LOCS III grading of lens opacities



Results (1)

- ***Use of lead glasses:***

- Great improvement through the decades (from 1990)

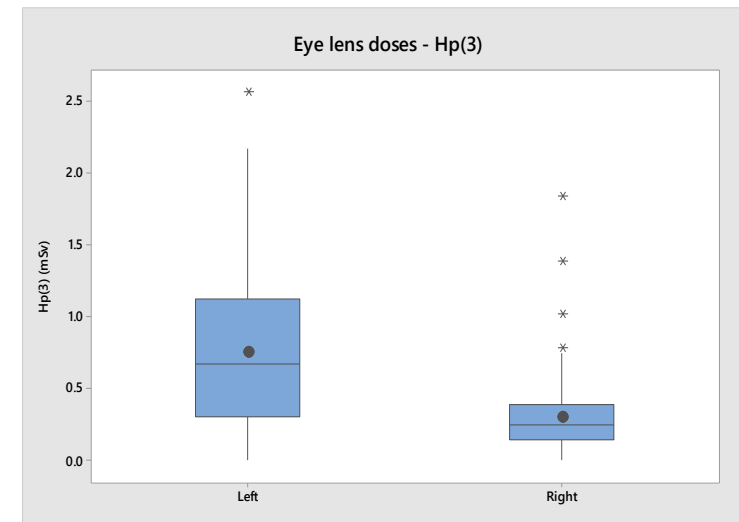
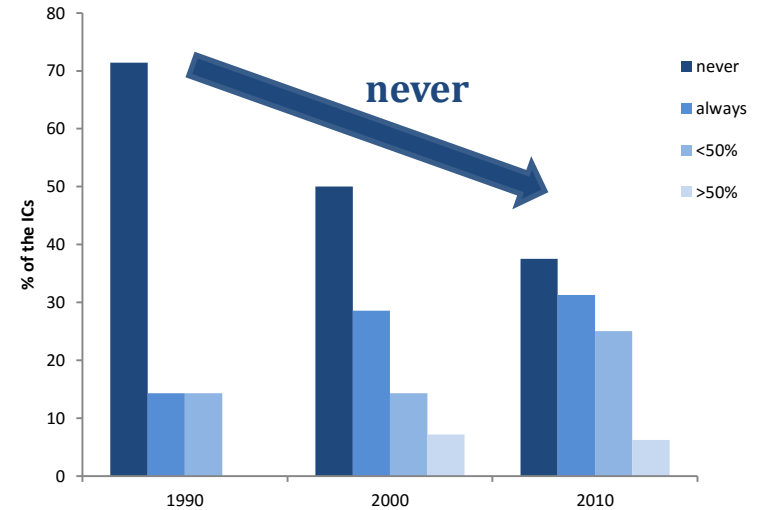
- ***Eye lens doses (from eye dosemeters):***

- Haemodynamists (CAs, PTCAs, etc.)

 - ⇒ higher left eye doses

- Electrophysiologists (PMs, RFCAs, etc.)

 - ⇒ higher right eye doses



Results (2)

Eye lens doses(from eye dosemeters)

Left eye:

max monthly Hp(3) \Rightarrow 2.56mSv
mean monthly Hp(3) \Rightarrow 0.76mSv
annual Hp(3) \Rightarrow 9mSv

Right eye:

max monthly Hp(3) \Rightarrow 1.84mSv
mean monthly Hp(3) \Rightarrow 0.3mSv
annual Hp(3) \Rightarrow 3.7mSv

Estimated annual doses < annual dose limit of 20mSv

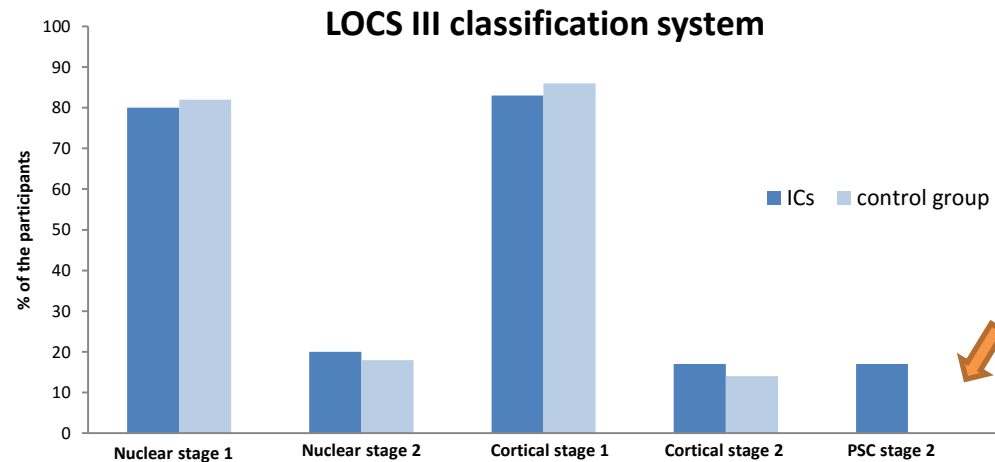


(based on the measurements and data from the questionnaires)



Results (3)

Lens Opacities Grading (LOCS III)



➤ Nuclear and cortical cataract \Rightarrow common for both groups

➤ 4 ICs detected with early PSC opacities

Probable causes:

Higher workload, longer fluoroscopy time, rare use of lead glasses

Conclusions

- The doses to the eyes of ICs can be significant
- Eye dosimeters help to the assessment of cataract risk
- Use of radioprotective glasses is highly recommended
- Training on radiation risk and protection is encouraged



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