EVALUATION OF EXPOSURE INDEX (lgM) IN ORTHOPAEDIC RADIOGRAPHY

L. Lança[1] and A. Silva[2]
[1]School of Health Technology, Lisbon Polytechnics, Lisbon, Portugal
[2]Department of Electronic, Telecommunications and Informatics, Aveiro University, Aveiro, Portugal

The exposure index obtained from a radiographic image could be a useful feedback indicator to the radiographer about the appropriate exposure level in clinical routine. AGFA exposure index is labelled as lgM and it indicates how close the actual detector dose is at the expected dose. The lgM is related to detector exposure and it does not replace patient dose related parameters such as DAP or ESE. The expected lgM value for any Speed Class (SC) is about 1.96 and should be consistent to a 2.5 μGy exposure measured at the detector. Because of its logarithmic nature, each change of 0.3 in lgM corresponds to reach the double or half of dose. For example, if the lgM value for a given image is calculated as 2.26, it indicates that the dose was about twice as that expected for the selected SC. The dose level at the detector is determined as the median of the logarithmic pixel values in the main histogram lobe.

The aim of our study is to evaluate exposure index (lgM) in orthopaedic radiography performed in a clinical routine environment. In this study we analysed the lgM of 267 exposures performed during a period of one month. All the radiological projections were acquired using an AGFA CR system (MD plate).

The mean value of lgM in our sample is 2.14. One sample *t*-test at a significance level of 5% shows a significant difference (p=0,000 ≤0,05) from 1.96 lgM reference. Data shows that 72% of the exposures are above the 1.96 lgM and 42% are above the limit of 2.26, which indicates that the imaging plate receives at least the double of exposure necessary to produce an adequate image. Median values of lgM are above 1.96 and below 2.26 for SC200 (2.16) and SC400 (2.13). The interquartile range is lower in SC400 than in SC200. The range between upper and lower quartiles is smaller in SC400.

This data seem to indicate that lgM values found in our study are above the manufacturer's reference of 1.96. Exposure technique chart should be optimized in order to provide a significant reduction of dose in the detector. This action accomplished with further studies for exposure optimization should result in a substantial reduction in patient exposure.

E-mail presenting author: luis.lanca@estesl.ipl.pt