

Dose Assessment Of Public For Some X Ray Machines In Albania

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Dose Assessment Of Public From Radiology Examinations Is A Very Important Element For Understanding The Risk Coming During The Radiographic Examinations In The Medical System . The Purpose Of This Study Is To Know How, The Different X Ray Machines In The Country Contribute To The Dose Populations. This Study Also Take Into Considerations Elements F The X Ray Room Like Thickness Of The Wall And Type Of Constructed Material Etc. These Doses Are Calculated For The Pubic, And Taking Into Account Other Factor Related To Occupancy, Dose Rate, Time Of Exposure Etc. PUBLIC EFFECTIVE DOSE FROM X RAY MACHINES In Radiology IN ALBANIA

Introduction:

Public dose assessment as result of use of x ray machines in the radiology system is one the main aspect of the protection of the public in the medical system. The international standards require that the limit of annual effective dose to the public is 1 mSv. There is no any assessment of the public dose from radiography system in Albania. **Absorbed dose** is used to assess the potential for biochemical changes in specific tissues. **Equivalent dose** is used to assess how much biological damage is expected from the absorbed dose. (Different types of radiation have different damaging properties.) **Effective dose** is used to assess the potential for long-term effects that might occur in the future. **Effective dose** is a calculated value, measured in mSv, that takes three factors into account: the absorbed dose to all organs of the body, the relative harm level of the radiation, and the sensitivities of each organ to radiation. The kerma, K , is the quotient dE_{tr} by dm , where dE_{tr} is the sum of the initial kinetic energies of all the charged particles liberated by uncharged particles in a mass dm of material . Unit: J/kg. The special name for the unit of kerma is gray (Gy).The kerma rate, $K \cdot$, is the quotient dK by dt , where dK is the increment of kerma in the time interval dt , Unit: J·kg⁻¹·s⁻¹. If the special name gray is used, the unit of kerma rate is gray per second (Gy/s).

Methods: With purpose of fulfillment and finding the annual dose to public for different machines in Albania is used the method of assessment of dose ,through the measurements of the kerma rate in the public areas in different hospitals in Albania. The method consist in the measurements of the kerma rate for the appropriate energy and response time . The dose rate is calculated taking into account the scattering factor. The dose rate than is multiplied with the time for some different examinations in radiology. The maximum annual effective dose to the public is calculated as dose rate x number of examinations per day x average time for examinations number of working days per week x 4 weeks per month and x 12 months.

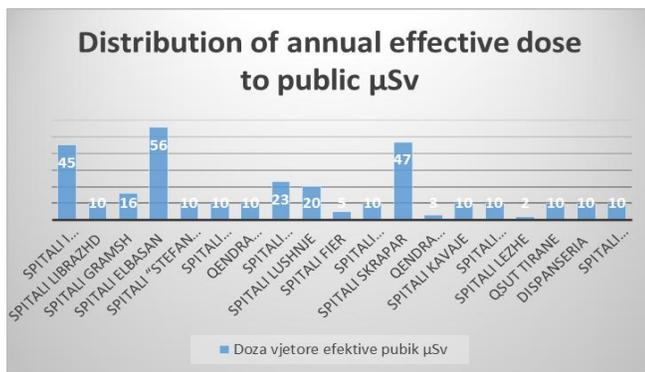
Results: The measurements cover main hospitals in Albanian and they cover many aspects related to annual effective dose to public. The measurement are made with the equipment FH 40 G Multi-Purpose Digital Survey Meter The table 1 present the number of measurements which are made in different hospitals in Albania.

Table 1 Distributions of the annual dose for different clinics in Albania

FACILITY Radiography Equipment	ANNUAL EFFECTIVE DOSE TO PUBLIC μSv /Y
Spitali I Mushkerive "Shefqet Ndroqi	45
Spitali Librazhd	10
Spitali Gramsh	16
Spitali Elbasan	56
Spitali "Stefan Gjoni "Kruje	10
Spitali Rajonal Lac	10
Qendra Shendetesore Fushe Kruje	10
Spitali Rajonal Durres	23
Spitali Lushnje	20
Spitali Fier	5
Spitali Rajonal Berat	10
Spitali Skrapar	47
Qendra Shendetesore Shijak	3
Spitali Kavaje	10
Spitali Amerikan Durres	10
Spitali Lezhe	2
QSUT Tirane	10
Dispanseria	10
Spitali Rajonal Pogradec	10

Graf 1 Distribution of annual dose for public in different hospitals in Albania

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From the study is clearly shown that the annual effective to the public is very low. Compared to the annual dose to the public 1 mSv a year is to far.

Conclusions: Assessment of dose to the public show very low results. This because the public is over protected due to several aspects of radiation. First in many hospital they use old x ray room which has been over shielded for old x ray machines. In near all of them the machines are replaced with better conditions regarding radiations. Due to lack of knowledge the staff and public are overprotected in all aspects.

Discussion: The annual effective dose to public is very low due to some aspects. In Albanian the safety culture is very low and shielding are over protecting the public.

References

- [1] IAEA, IAEA safety standards series no. GSR part 3 (interim) , International atomic energy agency, 2011, Vienna.
- [2] CJ Martin, Biomedical imaging and intervention journal optimization in general radiography, health physics, Gartnavel royal hospital, 25 October 2006, Glasgow, Scotland
- [3] International atomic energy agency. IAEA technical reports series no. 457. Dosimetry in diagnostic radiology an international code of practice 2007, Vienna.