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Research Article

Knowledge of the Use of Radiation among Urology Residents

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ABSTRACT

Objective: Describe the knowledge in the use of radiation by residents of urology. Censor formal education about the correct use of radiation and know the percentage of residents who inform their patients of the exposure to ionizing radiation.

Methods: Observational, transversal, multicenter. The survey prepared by Jindal, 2015, with prior authorization of the author. They were integrated and analyzed the data by the SPSS platform.

Result: 62 surveys, 81% have completed at least 3 years of residence. 100%. They are subjected to radiation during their formation. 56.45% are submitted between 1 and 5 procedures a week. 98% of residents use some protection devices. The more used is the vest with 100%, The 9.68% use dosimeters. 85% of residents do not receive any formal training or class. 40.32% of residents never inform their patients that they will be exposed to radiation.

Conclusion: The data obtained are comparable with the residents of India, Europe, and the United States. The patient should be informed that radiation will be used. Formal education and training in the use, protection and effects of ionizing radiation from urologists information represent an area of opportunity for the restructuring of the education programs.

Keywords: Resident; Urology; Radiation; Knowledge

INTRODUCTION

During the last three decades, Urology has evolved and progressed, becoming minimally invasive, from open to endourological surgical techniques [1]. The different diagnostic and therapeutic techniques require the support of ionizing radiation during the procedures [2]. Exposure to ionizing radiation produces various deleterious effects on the body, which may be dependent or independent of absorbed dose by the human body. The main organs affected are the lens, skin, thyroid gland caused by cataracts, dermatitis and thyroid conditions such as hypothyroidism or malignancies [3,4]. The effects caused by radiation can be deterministic or stochastic. The former result from effects on the target organs associated with the cumulative dose. Stochastic effects are independent of dose and depend on the organism, among these effects are the appearance of cancer cells [5]. The effective dose refers to the amount of radiation absorbed in the tissues and is directly related proportional to the deleterious effects on the different organs [6]. The recommendations and guidelines that promote the optimization of the use of radiation to reduce the effects of radiation in the body are called "ALARA" "As low as reasonably achievable" [7]. The ionizing radiation irradiated by fluoroscope in endourological procedures is used as primary working tool, proper use, training and knowledge allow reduce the effects of radiation on the patient and health personnel. The Official Mexican Standard-229-SSA1-2001 establishes the requirements for the protection of personnel and patients in the use of radiation, establishing as requirements to be provided with mandrel with a minimum thickness of 0.5 mm, the protective collar of 0.5 mm, in addition to dosimeters [8]. In the study conducted by Asdrubal in surveying 979 spine surgeons, dosimeter use was found in 50% of respondents, 62% use the thyroid protector and 27% know the recommendations by ALARA for reducing radiation exposure to the patient and staff [9]. 100% of residents are exposed to radiation, at least 75% are

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exposed to three weekly procedures [10]. 44% of residents have never received a formal class of radiation used in the United States, similar to European residents. In India, 85% have never received any training [10-12]. The use of other protective devices in urology residents in Europe is less than 20%. Forty-six of residents in India do not use a thyroid protector, 0% wear protective gloves [11,12]. 76% of residents in India know the recommended thickness for the protective vest and 15% of residents report to patients who will also be exposed to radiation [12].

OBJECTIVE OF THE STUDY

Describe the knowledge in the use of radiation, degree of exposure in health personnel, as well as describe the tools used to reduce harmful effects, in addition to censoring formal education about the correct use of radiation and protective devices.

MATERIALS AND METHODS

Cross-sectional, multicenter, observational study. A literature review was conducted on PubMed, Cochrane search engines using keywords radiation, radiation knowledge, ionizing radiation protection, urology and residents, where 3 base articles were selected . For the evaluation, the survey prepared by Jindal , 2015, with prior authorization of the author was used. The Survey of Urology residents (10 hospitals in the center, north and south of the country) was distributed to the chief urology resident of each participating centers. Participation of resident physicians of all years was voluntary, no randomization were used. The survey was carried out through the Survey Monkey platform. The data was integrated and analyzed by the SPSS platform, descriptive statistics and measures of central tendency were used for the analysis and representation of the collected data.

RESULTS

Population

62 surveys were collected answered by resident physicians who are residing at the "José. E. González "UANL, High Specialty Medical Unit No. 25 of IMSS, High Specialty Medical Unit No. 33 of IMSS, Regional High Specialty Hospital of Yucatán, Regional Hospital ISSSTE Monterrey, Nuevo León, Specialty Hospital National Medical Center La Raza, Dr. Manuel Gea González General Hospital, National Institute of Medical Sciences and Nutrition "Salvador Zubirán", Multicentre Program of Medical Medical Residences of Monterrey and Central Military Hospital (Table 1). The average time for the survey response is 2 minutes.

Table 1: Number of urology residents survey participants by Hospital.

Hospital	No. of resident
University Hospital " José. E. González "UANL	17
IMSS High Specialty Medical Unit No. 25	20
IMSS High Specialty Medical Unit No. 33	3
Central Military Hospital	1
Regional High Specialty Hospital of Yucatán	1
Regional Hospital ISSSTE Monterrey, Nuevo León	8
Specialty Hospital La Raza National Medical Center	1
Dr. Manuel Gea González General Hospital	5
National Institute of Medical Sciences and Nutrition "Salvador Zubirán "	2
Monterrey Multicentre Medical Residences Program	4
TOTAL	62

25% (n=16) of the respondents are currently in their third year of residence. 81% (n=50) of the respondents have completed more than three years of medical training (Table 2).

Table 2: Number of urology residents survey by year of residence.

Year of Residence	Number	Percentage
1	7	12%
2	5	8%
3	16	26%
4	13	21%
5	15	24%
6	5	8%
7 or>	1	1%
Total	62	100%

100% (n=62) of respondents are subjected to radiation during their training. 56.45% (n=35) are submitted between 1 and 5 procedures per week where radiation is used, either by performing or assisting the procedures. 37.10% (n=23) undergo six to ten weekly procedures (Table 3).

Table 3: Number of procedures performed per week.

No. of procedures/ weekly	Number	Percentage
1 to 5	35	56%
6 to 10	2. 3	37%
11 to 15	4	7%
16 to 20	0	0%
Total	62	100%

When questioning the frequency used by protection methods, 51.62% (n=32) uses it sometimes, 40.32% (n=25) always uses it (Table 4).

Table 4: Frequency of protection device used per week.

Frequency of device use	Number	Percentage
Always	25	40%
Sometimes	32	52%
Rarely	4	6%
Never	1	2%
Total	62	100%

98% of residents use some protection devices. Among the devices that are used, the most used is the vest with 100% (n=62), followed by the collar 41.94% (n=26), protective lenses 4.84% (n=3); None of the residents surveyed wear protective gloves. In addition, only 9.68% (n=6) use dosimeters for radiation measurement (Figure 1).

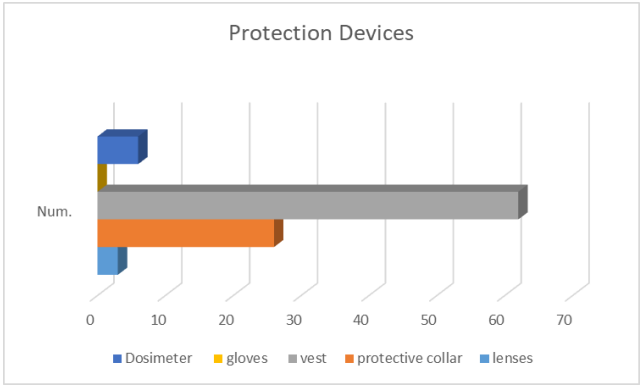

Figure 1: Protection devices used by residents during procedures with radiation.

85% (n=53) of residents do not receive any class or training about the use, effect and optimization of radiation during their residence (Figure 2).

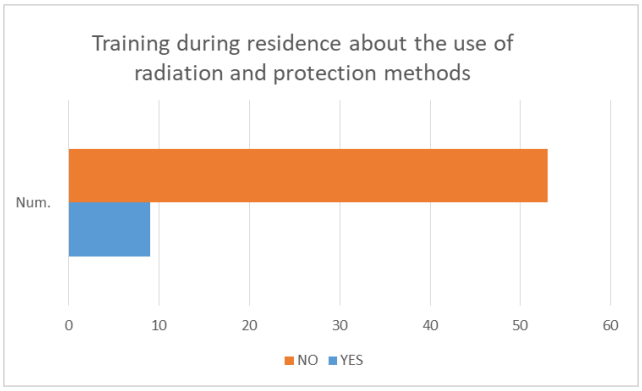

Figure 2: Training during residence about the use of radiation and protection methods.

Questioning on the International Unit of the absorbed radiation, 66.12% (n=41) answered incorrectly. 33.87% (n=21) responded correctly; Sievert as a unit of measure for absorbed radiation (Figure 3).

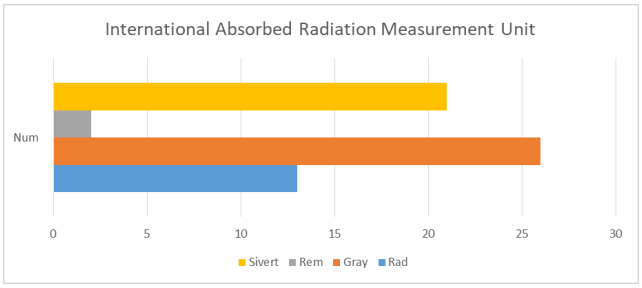

Figure 3: Knowledge of international absorbed radiation measurement unit.

When questioning the knowledge of other measures to minimize radiation exposure for the health worker or the patient, proposed by the ALARA guidelines, giving the option to select several responses. 87% of residents (n=54) use physical radiation protection measures, but are unaware of other available strategies; such as the position of the radiation emitter, moving away from the emission source, providing pulsed radiation, among others (Figure 4).

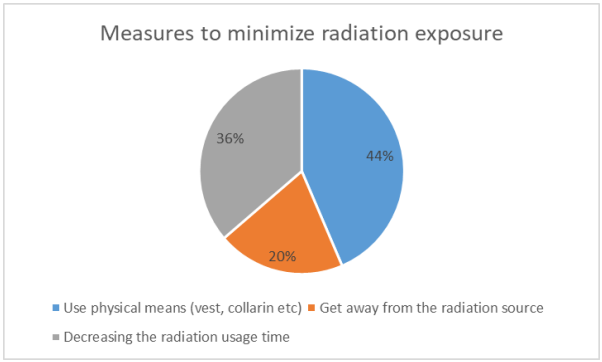

Figure 4: Actions used by residents to minimize radiation exposure.

55% (n=34) do not know the recommended thickness of the protective vest is 5 mm (Figure 5).

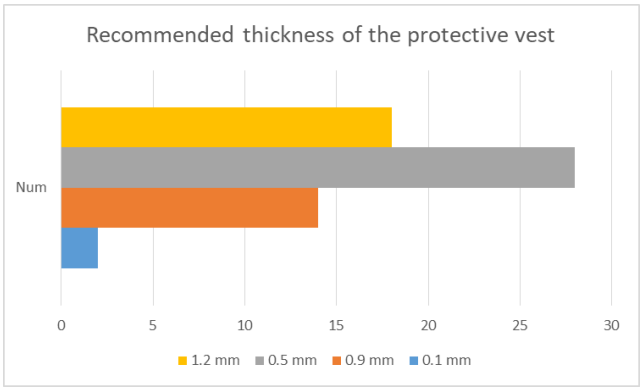

Figure 5: Knowledge of recommended thickness of protective vest.

Regarding the information provided to the patient by the resident physician about the radiation to which the patient is also exposed, 40.32% (n=25) of the residents never inform their patients that they will be exposed to radiation during the procedures 32.26% (n=20) sometimes inform the patient (Figure 6).

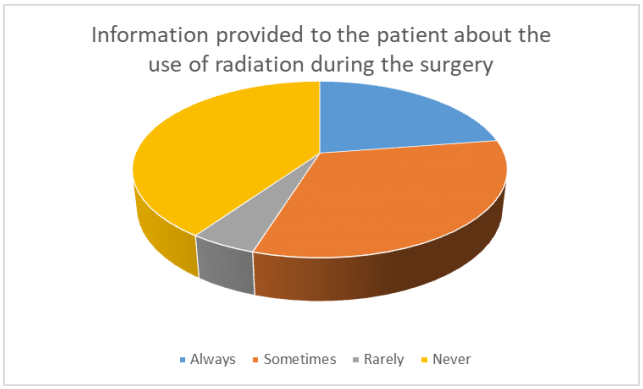

Figure 6: requency of patient information about the use of radiation during the surgery.

DISCUSSION

The evolution of surgical medical care in Urology in recent years has progressed, becoming minimally invasive, so it requires other tools such as the use of radiation, so urologists and patients are subjected to its benefits Diagnostic and therapeutic, without considering the deleterious effects to health, this associated with the ignorance of the harmful effects and methods of protection available [1,3]. Resident physicians undergo a large number of procedures where this tool is used, which mostly does not receive formal education about the appropriate use, effects and methods available to lessen the effects of radiation [10]. There are no appropriate devices to reduce the effects, measure the amount of radiation to which they are immersed. In addition, most do not inform patients or believe that the patient will also be subjected to the effects of radiation [12]. The education of residents and health personnel is an area of opportunity in Modern Urology, education programs must be restructured, as well as regulating the exposure time to ionizing radiation and providing protection devices. The urology resident is unaware of the proper use, protective devices and measures to reduce the amount of radiation absorbed by the staff and the patient, our results coincide with studies conducted in the United States, Europe and India [10-12].

CONCLUSION

The results of our study prove the residents' lack of knowledge in the use, protection and formal education of ionizing radiation. The data obtained are comparable with residents of India, Europe and the United States. The education of urologists in training represents an area of opportunity for the restructuring of the country's education programs, as well as providing adequate protection devices; resulting in optimal use of ionizing radiation and decreasing the deleterious effects on health personnel and of our patients.

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