Technical knowledge assessment in radiology in patients protection in collective environments and more radiosensitive organs.

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ABSTRACT

The use of X-rays in medical fields has increased significantly in recent years, since various therapeutic procedures can be performed without the need for surgery, which presents the greatest risk to the patient. An example of this increase is the practice of cardiac catheterization, this procedure fluoroscopy is used for placement of central venous catheters and temporary pacemakers, and long-term use increases the risk of exposure to X-rays to the patient, doctor and his assistants. This has been observed with concern by many researchers, since many companies did not fit the standards of radiation protection. This failure can lead to exposure of professionals, patients and caregivers. It is therefore of fundamental importance, the use of personal protective equipment such as aprons and thyroid plumbíferos protectors, for dose reduction produced by the primary and secondary radiation. This study evaluated the knowledge of radiology professionals in Goiânia, on the use of lead apron in collective environments and use of guards in sensitive parts of patients to radiation. Through an information gathering technique based on a questionnaire with closed questions. From dista and focuses on the knowledge of professionals. The results showed that there is a serious deficiency as regards the most radiosensitive organ protection of patients when they are exposed to X-ray beams.

Keywords: display, radiosensitivity, protection

INTRODUCTION

The use of X-rays in medical areas has increased significantly in recent years, since various therapeutic procedures can be performed without the need for surgery, which is at higher risk for the patient[1]. An example of this increase is the practice of cardiac catheterization, this procedure fluoroscopy is used for placement of central venous catheters and temporary pacemakers, and long-term use increases the risk of exposure to X-rays to the patient, the doctor and his assistants[2]. And this has been noted with concern by many researchers, since many companies did not fit the radiological protection standards[3,4,5]. The inadequacy of the radiation protection service can lead to unnecessary exposure of professionals, patients and caregivers. The radiological protection system should strive to keep exposures below recommended thresholds, thereby limiting stochastic effects. It is therefore fundamentally important personal protective equipment use (IPE) as plumbíferos aprons and thyroid protectors for dose reduction produced by the primary and secondary radiation[6]. The lead aprons 0.5 mm in thickness can trap up to 98% of the secondary radiation and 0.25mm hold up to 96% by protecting the gonads and about 80% of the active bone marrow. The thyroid gland protectors can reduce exposure by up to 10 times. The plumbíferas surgical gloves, which are commercially available, have an attenuation factor

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against radiation ranging from 5 to 20% [7]. In addition to the equipment listed above, every fluoroscopy equipment must possess curtain or skirt plumbífero, bottom and side, as well as screens or mobile lead screens with a thickness not less than 0.5 mm lead equivalent for operator protection against scattered radiation the patient [6,7,8,9,10]. The plumbíferas clothes in no time must be folded and when not in use must be kept in horizontal surface or support appropriate therefore to bend the lead coating may fracture and violate the radiation protection system[6,8]. Rarely a protection fault of plumbíferas garments can be detected visually and they should go through fluoroscopy annually to check its integrity. By not using the plumbíferos PPE during examination of vascular catheterization, professional increases the exposure dose by a factor of 10 or more [7]. Measured the effective dose received by the thyroid gland doctors, and concluded that the doses were 10 times higher for the case of those who worked unleaded protection [11]. For the purposes of application of regulatory standards, it is considered personal protective equipment (PPE), every device or product, for single use used by the worker, for the protection of susceptible risks threaten the safety and health at work. All PPE, national or imported manufacture, can only be offered for sale or used with the Certificate of Approval of the indication (CA), issued by the national body responsible for safety and health at work of the Ministry of Labor and Employment (MTE) which is responsible for monitoring the quality of the equipment. They should be available free and in good condition in diagnostic radiology services, and healthcare team should be able to use and maintain the equipment properly 12].

PPE should be used in the following cases:
1) The professional who is any part of the body exposed to the primary beam, you should use apron with at least 0.5 mm lead equivalent;
2) Professional and the companion to protect the scattered radiation should make use of apron with at least 0.25 mm lead equivalent;
3) Unless such shields degrade important information when the most radiosensitive organs of patients, are up to 5 cm of the primary beam, you should use protection at least equivalent to 0.5 mm lead;

4) In radiological examinations in hospital beds or collective hospital environments. Patients who can not be removed must be protected from scattered radiation, a full-length barrier, with at least 0.5 mm lead equivalent; or positioned so that your body is not less than 2 m from the head or the image receptor [13].

With very low fitness values in a large number of services, radiation protection of the patient provided the best critical dimension according to a survey, and this suggested the need for a change in the performance of the two supervisory authorities of radiotherapy services, and CNEN Health Surveillance [6]. Importantly, the companies of medical and dental diagnostic radiology should put into practice every day, which is established at the gate 453. For thus provide a higher quality service and safety to the user [14,15].

Since the observation of the rules reflects a service with greater protection to patients and professionals involved in this activity, we propose to evaluate the knowledge of radiology professionals in Goiânia, in the following areas:
1- Use of lead apron in patients in collective environments
2- Use guards in sensitive parts of patients to radiation.

MATERIALS AND METHODS

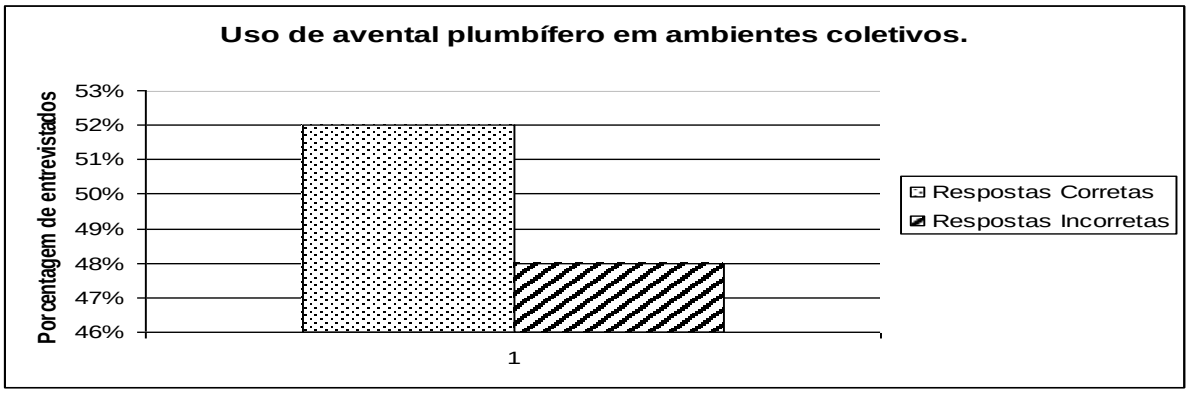
This is a field of research, descriptive, with a quantitative approach [16] aim is an approximation of reality from the frame of reference of the study subjects themselves, up to

the researcher seeking to understand the meaning of human action and not just describe it using the information collection technique based on a questionnaire (Appendix 1) with closed questions, prepared for this purpose and it was delivered and collected personally. From this survey, we sought to assess the knowledge of the basic guidelines of radiological protection. The universe of this research are the radiology technicians who work in the city of Goiânia. The Association of Technicians in Radiology by office of the State University of Goiás - UEG provided us with this number of technical and through a statistical expression determine the sample size.

Questions were asked regarding the radiological protection guideline, 79 radiology technicians and the results presented here has a 10% uncertainty. The choice of research participants was random, and these belong to the public or private service regardless of gender or age. The data collected in the questionnaire were tabulated for analysis and the results are organized into charts in Microsoft Excel.

RESULTS AND DISCUSSION

In conducting radiological examinations with mobile equipment in hospital beds, or collective of hospital environments patients who can not be removed from the environment must be protected from scattered radiation by a protective barrier at least 0.5 mm lead equivalent or be positioned a minimum distance of 2m from head or the image receptor [8]. Figure 1 brings the results of the use of lead apron in patients in the collective hospitalization environments.

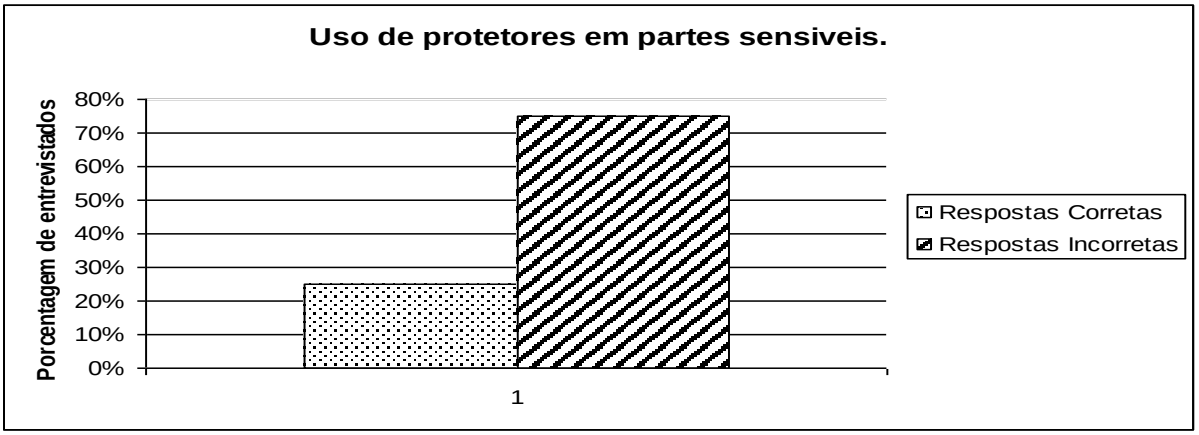


Graph 1 - apron of Use plumbífero in collective environments.

Almost half of respondents did not correctly answered the question on the protection of patients in collective environments. Studies by [17] showed that examinations are held in collective environments without the use of shielding and without proper removal of other patients and caregivers of ray equipment X. This shows the lack of security in the use of ionizing radiation in environments collective, because of these measures could reduce the dose considerably [7]. The radiation protection of the patient provided the best critical dimension, with very low fitness values in a large number of services[14]. What ends up generating deliberately exposure without justification [8]. This may be related to lack of knowledge of safety standards and / or lack of structure of companies that do not provide safety equipment in the right quantities for laboratory tests[14,15,17].

According to the radiological protection guidelines must be placed properly protected

in the most radiosensitive organs such as gonads, lens and thyroid, by necessity when they are directly exposed to the primary beam radiation or up to 5 cm it, unless such shields exclude or degrade diagnostic information importantes. Graph 2 has the results of the use of guards in sensitive parts of the body of patients undergoing examinations with ionizing radiation.



Graph 2 - Use guards in sensitive part.

According to the chart 2, nearly 75% of respondents did not know to use shields to protect the most radiosensitive organs. There is negligence on the part of some companies regarding the radiological protection of the patient, as the most radiosensitive organs (thyroid and gonads) are not protected during radiographic examinations, since the institutions do not offer this type of personal protective equipment [17]. Aprons plumbíferos can trap up to 96% of secondary radiation, protecting the gonads [18].

It is known that the lack of personal protective clothing and the absence of a periodic control are some of the examples that demonstrate the lack of attention given to ionizing radiation in Brazil [6]. What is consistent with the need for professional training programs involved in these activities in order even to ensure a good quality of service [14,15]. Companies should reduce the dose to the maximum through the use PPE to so limit the induction of stochastic effects [19].

CONCLUSIONS

Almost half of radiology professionals working in Goiânia, does not know that should protect patients when tests are performed in collective environments, which could cause unnecessary exposure, as unaware of the protection rules.
How nearly 75% of respondents did not know that they must protect the most radiosensitive organs of patients when they are exposed to ionizing radiation, we believe that there is a strong indication, that protection procedures are not carried out correctly, which could cause serious damage to patients, which were often exposed to higher doses of these procedures.

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