Diagnostic radiation of potentially reproductive females

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ABSTRACT

Objectives: To find out how consistent or variable is the understanding and practice of radiation protection procedures for women in the child bearing age at a multispecialty tertiary hospital. Setting: Riyadh Military Hospital Study. Design: Non-clustered population survey. Methods: A questionnaire was distributed during grand rounds, mid-day clinics and a radiology conference. Questions included which radiation protection role does the respondent use for females, whether he or she is familiar with those rules and what is his or her source of reference. Further questions were about the radiation dangers to the fetus. Results: Response was 95 (100%). Fifty-seven (60%) were males and 38 (40%) were females. The majority 50 (53%) were Saudis, 16 (17%) Western and 29 (30%) were other nationals. Sixty-two (65%) followed the old rule "10-day rule"; 17 (18%) followed the new "28-day rule" and 16 (17%) didn't know which rule to follow. None of those who followed the "28-day rule" indicated hospital policy as their reference. Conclusions: The understanding and practice of radiation protection guidelines for females is inconsistent. There is significant unfamiliarity with the radiation protection rules among our hospital practitioners.

Keywords: Radiation protection, fetal irradiation, reproductive females.

There has been significant changes in the guidelines concerning the exposure of women in the child bearing age to diagnostic radiation.1,2 The 10-day rule1 was replaced by the 28-day rule.2 The old 10-day rule states that all radiologic examinations of the lower abdomen and pelvis of women of reproductive capacity, that are not of importance in connection with the immediate illness of the patient, be limited in time to the period when pregnancy is improbable, i.e. the 10-day interval following the onset of menstruation. This was replaced by the 28-day rule which states that the risk of irradiating a fetus is too small in the first month following the start of menstruation and no limitation is necessary unless a period is missed. Lately there has been a recommendation of limited return to the 10-day rule3 for procedures delivering high radiation dose to the female pelvis, namely pelvic computerized tomography (CT) and barium enemas.

From our own observation, many questions on safety and timing do arise when performing or deciding appointments for radiologic procedures in females. The objective of this study is to find out how consistent or variable is the understanding and practice of diagnostic radiation for potentially reproductive females among our hospital practitioners.

Methods A non-clustered population survey A questionnaire was distributed during grand surgical and medical rounds, a radiology conference and mid-day primary care/dental clinics. Some of the meetings were attended by personnel from other institutions in Riyadh. These were excluded from this study. Demographic information was collected. Respondents were asked whether they followed the 10 day rule or the 28 day rule and whether they were familiar with either of them. They were also asked about their source of information regarding these rules whether it was from the hospital policy, a book, a lecture, a course or their own guess. Further questions covered what the respondent would consider is the most dangerous period for fetal exposure to diagnostic radiation and what are the specific dangers. The questionnaire was initially pilot tested. In a study in Britain20% of hospitals followed the old guidelines. This was used as an acceptable risk with an allowance up to 35% for maximum tolerable prevalence to calculate the sample size for a statistical power of 99.9%. Results were manually checked for completeness and were subsequently entered on a data base file. Epistat statistical package was used for analysis and chi-square test for cross tabulation.

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Results There were 95 respondents (100%) of this cohort. Fifty-seven (60%) were males and 38 (40%) were females. The majority 50 (53%) were Saudis, 16 (17%) were Western and 29 (30%) were other nationalities. The actual jobs and departments are shown in Figures 1(a) and 1(b). Sixty-two (65%) indicated that they follow the 10 day rule; 17 (18%) followed the 28 day rule while 16 (17%) didn't know which rule to follow. Of those who followed the 28 day rule 12 (70%) were Saudis, 2 (12%) were Western and 3 (18%) were other nationalities. Thirty-seven (39%) respondents said they were not familiar with the 10 day rule and 66 (69%) were not familiar with the 28 day rule.

None of those who followed the 28 day rule indicated that hospital policy was their source of information. The selected definition for the child bearing age is shown in Figure 2. Only 2 (2%) of the respondents emphasized mental retardation as the potential radiation hazard to the fetus.

Discussion Radiation protection is an important aspect of patient care. The number of radiological examinations is increasing. As many as 20% of x-rays are not necessary. From our records, females represent (40%) of those undergoing radiological procedures in our department. It is not uncommon that a radiological examination for an adult female may be denied, rescheduled or canceled because of radiation protection guidelines. This may cause frustration.

The majority 62 (65%) of our hospital staff involved in this study followed the old guidelines. This is a very high proportion compared to a study in Britain. However our study was for individuals within one hospital unlike the study which compared policies in different hospitals. Our hospital is multinationaly staffed. In absence of strict adherence to hospital policy their response can give reflections of practices abroad or a prejudiced assumption for the practice in Kingdom.

Twenty years ago marital age in Saudi women was low. The rate of first marriage under 15 years of age was 33%. This has dropped to 3.5% but 15.4% of females between 15-19 years are married. About one third of our respondents believed that the child bearing age is only 18-40. This is an underestimate. Only 35 (37%) of respondents correctly identified the period with highest radiation risk to the fetus in utero (8th - 15th week). Accurate identification of this risky period was the main reason which prompted changes of the rules. Only 2 (2%) mentioned mental retardation as a possible risk. In fact this is the main potential danger.

Conclusion The understanding and practice of radiation protection guidelines for women in child-bearing age is inconsistent among our
practitioners. There is unfamiliarity with the guidelines. Training and education of personnel is necessary. Review and/or circulation of hospital policies is recommended.

References

1. Russell JGB. The rise and fall of the 10-day rule. BJR 1986; 59: 3-6.