

Chapter five

Discussion

This study is conducted to estimate the radiation exposure to the staff who working with ^{131}I therapy in the Tumor Therapy and Cancer Research Center (TTCRC); (four workers two physicists and two nurses)

The measurements of radiation exposure for physicist number one were (1.56,4.28,0.25,0.92,1.56,and 1.74) for receiving doses, given doses, first dose measure to the patient, second dose measure, discharge of patient and radioactive waste treatment and decontamination respectively .whereas for the second physicist were (0.88, 2.72, 0.81, 0.72, 1.63, and 1.24) for receiving doses, given doses, first dose measure to the patient, second dose measure, discharge of patient and radioactive waste treatment and decontamination respectively. Table (4.1)

The radiation exposure to the nurse number one from the patients given capsule (which is the first day caring for patients)was (0.41), at the second day caring for patients was (0.0), at the third day caring for patients was (0.81) and from the fourth day caring for patient were (0.0), for the first doses, second doses, third doses, fourth doses, fifth doses and sixth doses respectively. Table (4.2)

The radiation exposure to the nurse number two at the patients given capsule (which is the first day caring for patients) was (0.0), from the second day caring for patients was (0.81), from the third day caring for patients was (0.0) and at the fourth day caring for patient was (0.81), for the first doses, second doses, third doses, four doses, fifth doses and sixth doses respectively. Table (4.2).

The table (4.5) and figure (4.3) noted that the exposure of workers to radiation is less in the most experienced worker because the time it consumes to accomplish the task is less.

The study also noted that some of the exposures are excluded due to the nature of the work and the patient's response to the instructions given to him by the physicist before giving him the dose and also before and during reading the level of radiation from the patient. This study illustrated that, the dose exposure for physicists was high compared

to exposure dose of the nurse because the physicists receive additional doses due to their additional duty ,the physicist are firstly supervise on the process of transportation, shipping and storage of radioactive iodine capsule from aircraft till the hospital and that include all necessary precaution and measurement , secondly they deal with the decontamination , emergence situation , incident . thirdly they treat with radioactive waste , also they directly and closely handle with capsules when they give the patient radioactive iodine so they receive high dose during the measurements of the doses come from the patient during their stay period in the isolated room thus The received dose for given the physicist is the highest one due to direct dealing with radioactive capsule and patient .

Also in table (4.4), the dose was observed for the physicist and nurse, who was very low compared to standard doses recommended from IAEA, thus indicates good system and awareness of the staff and increased protection in the department.

Also the dose compared with new study

Study	Physicist	Nurse
Current study	172.48 μ Sv	35.88 μ Sv
EUR J Nucl Med	N.A	80 μ Sv

5.2 Conclusion

This study has been conducted on Tumor Therapy and Cancer Research Center (TTCRC) – Shendi for assessment of staff radiation doses during application of radioactive iodine, during the period from April to September 2017.

In this study the measured annual dose has been estimated for physicists and nurses respectively as follow (172.48), (35.88).

The measurements of this study illustrated that the highest received dose is for the medical physicists staff member of all the worker due to their high attach with patient and radionuclide iodine , whereas the nurse comes in the second grade due to their nature of work and their responsibilities which don't require high attrition with patient and radionuclide material , the medical staff member comes in the last grade regarding to rarity of emergency events , but for all worker inside iodine department, the dose was within the global stander of permitted dose level which established by IAEA and ICRP(20mSv in one year for worker) .

5.3 Recommendations

- The extremities have the highest received dose due to the direct expose from close contact of radionuclide iodine capsules during the process of receiving the container packages , administration of iodine capsule to the patient , handle of the iodine capsule and decontamination process so its highly recommended to be restricted monitoring to the extremities on the iodine department .
- After discharging process there is possible hazard from the patient to the public if they do not restrict with obligation and guides , so it's better to make further more studies to monitor the radiation doses to members of patient after leaving the isolation room in hospital.
- The worker who deal with iodine containers (shipping and travelling)may receive significant amount of radiation dose rather it's better to be adhesive monitoring for them during the trip from the receiving place (air port) long the way to the hospital .
- It's of paramount importance to increase awareness of radiation protection especially the nurses in order to increase their experience in dealing with emergency situation.