Sudan University of Science and Technology
College of Graduate Studies

MeasurementEffective Radiation Dose In of Patient Myocardial Infarct Imaging using Tc-99m – Pyrophosphate

قياس الجرعة المؤثرة للمريض فى فحص احتشاء عضلة القلب باستخدام بايروفوسفات99m تكنيشيوم

A complementary research submitted for partial fulfillment of the requirements of M.Sc. degree in Nuclear Medicine Technology

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DeDication:

To my parents ,who give me support always and who encourage me to do this work …

To my brothers …..

To my husband and sons…

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Firstly, I thank the Almighty God for unlimited help , health , strength and patience to complete this work .

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abstract

This study was conducted at AlnilainDiagnostic Medical Center in Khartoum, 50 patients was investigated for diagnosis of myocardial infractionusing Tc-99m pyrophosphate agent.The administered activity was calculated based on patients weight which ranged between(70-140)Kg for the study sample.The effective dose for each patient was calculated using the equation:

Effective dose = sum of [organ doses x tissue weighting factor].

The effective dose (E) to an individual was found by calculating a weighted average of the equivalent dose (H) to different body tissues, with the weighting factors (W) designed to reflect the different radio sensitivities of the tissues:

$$E = \sum_i Hi\, Wi$$

The data wasanalyzed using statistical program of social studies (SPSS) and Microsoft excel program .

Patients weights varied between (70-140Kg) and administered activities werefound to be between (3.75-5.56mCi) depending on the weights of patients and the average effective radiation doses in the case of the two cardiac imaging studies(stress and rest)ware (0.98-4.47mSv)and the average tissue weighting factors ware (14.67-95.44).It was found that the effective radiation dose was directlyproportional to the patient weight.

المستخلص

في هذه الدراسه تم حساب الجرعه الاشعاعيه المؤثرة في حالة تصوير امراض القلب عن طريق استخدام جهاز القاما كاميرا وتتم عملية التصوير علي مرحلتين تصوير تحت تاثير الجهد وتصوير عند الراحه واجري المسح لعدد50 مريضا بواسطة حقن المريض بعنصر التكنيشيوم 99م ويجري ذلك عن طريق تخطيط القلب المستمر اثناء القيام بفحص الجهد اوعند اعطاء بعض الادويه القلبيه البديله للتمرين التي تزيد من سرعه ضربات القلب ويتم خلالها حقن المريض باحد العناصر المشعه ثم تؤخذ صورة لعضلة القلب بتوجيه القاما كاميرا لالتقاط المواد المشعة التي سكنت بخلايا عضلة القلب (صورة جهد) بينما تؤخذ الصورة الثانيه بنفس الطريقه المتبعه لاخذ الصورة الاولي بعد ساعتين (صورة عند الراحه).وتم حساب الجرعه بواسطه معادلة الجرعه المؤثرة

$$E = \sum_i Hi\, Wi$$

ووجد ان اوزان المرضي تتفاوت بين(70-140كج)وكانت الجرعه في اختبار الراحه (3.75) اما في حاله الجهد (3.33)وذلكاعتمادا علي اوزان المرضي وكانمتوسط الجرعات في حاله الاختبارين معا (0.98-4.47) ومتوسط الوزن يساوي(14.67-95.44) .

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