

Distribution of Radiation in Erbil city

Nashwan Karkhi Abdulkareem(MSc)¹, Tara Nuradin Abdula(MSc)², Niaz Salh Abdula (MSc)³
and Dhahir Tahir Ahmad(MSc, PhD)⁴

Abstract

Background: Radiation is the emission or transmission of energy in the form of waves or particles through space or through a material medium. This includes electro-magnetic radiation such as radio waves, visible light, and x-rays, particle radiation such as α , β , and neutron radiation and acoustic radiation such as ultrasound, sound, and seismic waves. Radiation may also refer to the energy, waves, or particles being radiated. Some studies design to estimate the distribution of radiation in different streets and effect on health environment.

Objectives: To determine the magnitude of radiation in different streets in Erbil city and demonstrate the difference between them.

Methods and Materials: Palm RAD meter-nuclear radiation meter at Model-907) was used for investigation of radiation in different streets in Erbil city like (around citadel, 30m, 60m, 40m and 100m) A nuclear radiation meter is an instrument measures the nuclear radiation. In other hands it is used to detect the radiation in the spaces near the sources of radiation like (X-ray, CT-Scanner and others) at streets of Hospital, centers of bone fracture imaging are transmitted where nuclear radiation and x-ray radiation to the outside to the environment surrounding radiation sources. Which induces biological effects is more than standard value.

Results: The results showed that the nuclear radiation at small dose is present and detected in the different streets in Erbil city, but more dose are detected in the space near sources of radiation which are mentioned in the previous words. This increasing of nuclear radiation which is caused by sources of radiation like (X-ray, CT-Scanner, and the bomb of USA) included to biological and physiological effects on the people in Erbil city who are sting and working near these places is showed by statistical test.

Conclusion: Distribution of radiation is dependent on the sources of radiations doses, and discussing that to investigate how this radiation affects the physiology of human body and showing the disadvantage of increasing and decreasing of radiation with the location of people.

Key word: Distribution, radiation, sources, physical properties.

Corresponding Author: nashwankarhi@yahoo.com

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^{1,2,4} College of Medicine - Hawler Medical University - Erbil - Iraq.

³ College of Dentistry - Hawler Medical University - Diyala - Iraq.

Introduction

The radioactive elements and their radiations are indispensable part of the nature, Their influence are imminent and very important to study, environmental radioactivity measurements are necessary for back ground radiation level due to nature radioactive sources of a cosmic radiation, The geographical distribution of the radioactive pollution in eastern Japan have been investigated by monitoring the dose of radiation nuclides in the air 3 ,measurement of the radioactivity of soil and biological samples are scare 4 as of early 2013 physical health effects due to radiation have been observed among the public for Fukushima Dasichi Nuclear power plant worker [1,2].

The effects of ionizing radiation upon immune system function where first reviewed in detail by the committee in 1972 Aspects of the subject were discussed in further (UNSCEAR) reports as summarized in tables, showed the effects of the ionization radiation on the immune system[3].

The temporal distribution of radiation induced leukemia is often describe as were function 1,5 in a shape which was observed similarly only in humans on the osteosarcoma after administration of Ra-224,the time of observation in these cases was limited to ten years[4].

Humans are exposed to radiofrequency radiation from various sources (such as mobile phone, radiotransmitter, cordless phone, base stations, TV and others). Exposure to these sources of radiation causing adverse health effects with respect to cancer, sleep disorder, headache, etc. Some results were from vivo and vitro experiments [5].

Very little work have been done on the special and temporal distribution of radiation balance components over the tropical cities according to the difference of land, use patterns compressing industrial commercial residential rural and forest area [6].

So for all above reasons, this study done to determine the magnitude of radiation in different street in Erbil city.

Material and Method

The device is palm RAD meter Model (907) portable. The palm RAD 907 is designed both for users of conventional units (milliroentgens per hour, and counts per minute) and switch between conventional and SI units. Start the palm RAD 907 set the switch to the mode I want $\mu\text{Sv/hr}$ and set the bottom switch to on then does a four second system check, display the reading number, after used in this research for investigation of radiation data in different streets in Erbil city like (around citadel, 30m, 60m, 40m, and 100m), estimated all data in 10 clock.

Statistical analysis

Statistical package for science service was used in this data. All results are present as shown by ANOVA test used for comparison between the data of all street included in the presence study.

Results

The data in Table (1 and 2) shows that there are highly significance differences between and within the streets (around citadel, 30m, 60m, 40m and 100m) this means that there are highly significantly differences when compares between groups and within the groups by using analysis of variance(ANOVA) .

Table (1): The data in different streets in Erbil city.

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10
citadel	μSv/hr	30m	μSv/hr	60m	μSv/hr	40m	μSv/hr	100m	μSv/hr
max.	Mini	max.	mini.	max.	mini.	max.	mini.	max.	mini.
0,156	0.081	0.137	0.077	0.125	0.053	0.15	0.077	0.16	0.078
0.155	0.069	0.165	0.079	0.137	0.077	0.161	0.071	0.149	0.077
0.143	0.066	0.137	0.077	0.125	0.083	0.171	0.077	0.149	0.077
0.13	0.07	0.147	0.084	0.149	0.071	0.173	0.077	0.137	0.077
0.125	0.067	0.13	0.066	0.149	0.077	0.162	0.078	0.16	0.078
0.13	0.07	0.144	0.085	0.15	0.077	0.141	0.089	0.143	0.066
0.161	0.066	0.142	0.089	0.143	0.073	0.16	0.077	0.15	0.079
		0.137	0.095	0.137	0.053	0.149	0.077	0.149	0.077
						0.14	0.071		
						0.137	0.089		
						0.167	0.083		
						0.15	0.095		
						0.145	0.083		
						0.169	0.065		

Table (2): Analysis of variance between and within the different streets in Erbil.

Location	F=Frequency	Sum of square	df=degree of freedom	Mean square	Sig.
Between streets	133.785	0.117	9	0.013	0.000
Within the streets		0.008	80	0.000	
Total		0.124	89		

Discussion

The result of present study demonstrated that distributions of radiation were high and low as shown in table (1 and 2) in different streets in Erbil city like (streets around citadel, 30m, 60m, 40m and 100m). According to statistical analysis there are highly significantly differences within the streets (around citadel, 30m, 60m, 40m and 100m), this results agree with others studies done in different area such as India and United State of America [7,8,9]. And between streets performed in vivo and in vitro study. These results agree with other researchers [10, 11].

When radiation pollution in the street is alleviated to the biological or physiological change in the body or due to the pollution of the environmental around a sources of radiation. When radiation is present in the

blood, toxins in the tissues are drawn out as the irradiated blood passes through the tissues, the toxins are then carried to the liver for detoxification and on to the kidneys for excretion ,the effects of radiation depending on the dose, and types of ionizing radiation [12, 13, 14].

Fukushima Daiichi demonstrated that effects of ionizing radiation resulting in cancer diseases in patients [15, 16]. However people how have been evacuated has suffered from depression and other mental, negative health effects, higher relative risk, and cancer risk for unborn child [17, 18].

In conclusion, distribution of radiation is dependent on the sources of radiations doses, and discussing that to investigate how this radiations affects the physiology of human body and showing the disadvantage of

increasing and decreasing of radiation with the location of people.

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