Jurnal Teknologi

Full Paper

EVALUATION OF ELECTROMAGNETICS RADIATION FOR STROKE PATIENTS AND NON-STROKE PARTICIPANTS ACCORDING TO BODY SEGMENTATION

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Article history
Received
15 June 2015
Received in revised form
16 September 2015
Accepted
17 December 2015

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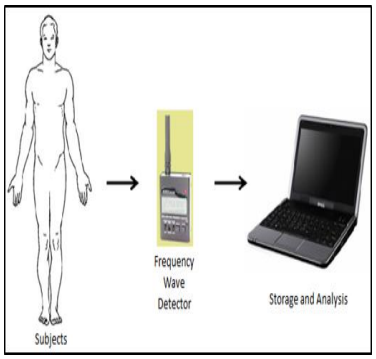
Graphical abstract



Abstract

This research evaluates the electromagnetic radiation (EMR) for the stroke patients and non-stroke patients according to body segmentation. The human body is divided into three segments: top, middle and bottom. The frequency in hertz is collected at 23 points around the human body namely left side, right side and chakra points from 199 subjects undergoing post-stroke treatment and 100 non-stroke participants. The EMR is captured using frequency detector equipped with a dipole antenna. The data is collected by taking the reading of the frequency 5 times at each point at the same location; hence, the average value is calculated. The statistical analysis of the EMR are examined using SPSS software and Microsoft excel is used to calculate the average frequency of the data. In conclusion, the findings significantly shows that stroke patients has lower frequency value of EMR for both right side and left side but has higher frequency for chakra system. This is true for all the three segments of the body. Furthermore, it is also shown that there is no correlation between the left and the right side frequency for the stroke patients whereas the left-right correlation values are significantly high for the non-stroke participants. This observation justify that EMR from human body can contribute to early detection for stroke.

Keywords-Electromagnetic Radiation (EMR); stroke; chakra; frequency detector

1.0 INTRODUCTION

The objective of this research is to evaluate the electromagnetic radiation (EMR) for the stroke patients and non-stroke patients according to body segmentation. This research is very significance to be conducted since stroke has become one of the major diseases in Malaysia. . It is ranked as 3rd disease behind ischemic heart disease and mental illness in The Disease Burden Study by Ministry of Health [1].

Nowadays, there are a lot of techniques to detect stroke such as Magnetic Resonance Imaging (MRI), Computerized Tomography, Carotid Duplex Scanning and few more. However, this research which has been approved by UiTM ethic committee intended to evaluate the differences of EMR between stroke patients and non-stroke participants using frequency detector. It involved 199 subjects undergoing post-stroke treatment at National Stroke Association of Malaysia (NASAM) while the non-stroke participants were volunteers from staff of Universiti Teknologi MARA, Shah Alam with compatible age range with stroke patients.

1.1 The Human EMR

A unique vibration of Electromagnetic Radiation (EMR) is emitted from human. Some researchers in this area concluded that EMR, also called body aura, reveals information on many aspects of human's life including physical health and psychological condition. It is believe that our psychological and emotional actions are sent throughout the body as electrical impulses radiating electromagnetic field (EM) fields outside the body, which are characteristic of the mental activity.

Technically, the human radiation wave occurrence has been concluded to be EM field generated by the biological system of body itself [2-5]. These fields surrounds the human in an oval shape, emits signals outward of the physical body in the distance 2-3 feet, and also found above the head and below the feet into the ground [6]. If the radiation field is static, no wave is transmitted but when the radiation field is dynamic, variation in field intensity happens as waves radiating outwards from the source body. The appearance of the EM field radiation, whether attractive or repulsive, depends on human physical health, mental attitudes, and spiritual development [7, 8].

In practice, there are two main parts that concern on EMR which area health and chakra region. A chakra is central points for the reception, absorption and transmission of energy in the human body. It symbolizes a point of intersection between mind and body, i.e. related to psychological and physiological state of a body [6, 9].

1.2 Stroke

Stroke which usually affects one side of body is a sudden attack of weakness, resulting from an interruption of the brain blood flow [10]. It happened when the blood flow to a part of the brain is clogged, causing in the cutting oxygen supply, hence, injuring brain tissue. The physical or mental functions that are controlled by the injury area of the brain are affected by stroke [11]. In most cases, the stroke patient fails to move one side of the body or have difficulty in thinking or speaking [10, 12]. The effect are varies from one to another victim, depending on which part of the brain is injured, also subject to the degree of that damage relatively minor and short-lived [13]. Some patients are left with more severe and long term disabilities [14].There are two main types of stroke, which are ischemic stroke and hemorrhagic stroke, which attacking human being with different causes. Yearly, as reported by NASAM, it shows that approximately 40,000 Malaysian people are suffering from stroke. In fact, hourly, there are six new cases of stroke occur in Malaysia [15].

2.0 EXPERIMENTAL

The research involved four main steps. Firstly, it involved instrument setting and measurement procedure to validate the frequency detector. Secondly, the frequency of EMR was collected consistently at a specific place. The body frequency in hertz is collected at 23 points around the human body namely left side, right side and chakra points. Next, the raw frequency data was validated to verify that the values collected were in acceptable range. Finally, the data was analyzed using SPSS and evaluated using Microsoft Excel.

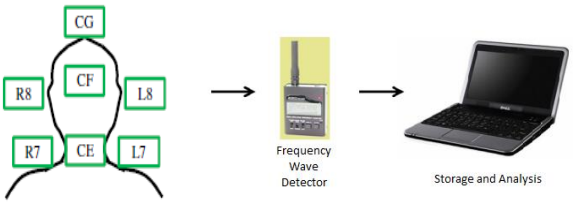


Figure 1 Data acquisition procedure [16]

Figure 2 Frequency Detector [17]

2.1 Data Acquisition

This task involves the collection of raw data. Figure 1 show the data acquisition procedure performed at NASAM and Electrical Engineering Faculty, UiTM. The frequency is captured through body radiation wave detector that equipped with telescoping whip antenna used to detect a broad range of electromagnetic waves of human radiation fields (see Figure 2). The frequency radiation is taken from 7 points on human top part, consisting 2 points on the left-side (L7, L8), 2 points on right-side (R7, R8) and 3 points on the chakra points (CE, CF, CG). There are only 4 points involve in the middle part which are L6, R6, CC and CD. The bottom part consists of only 5 points which are L1, L2, R1, R2 and CB. All the radiation points' measured was illustrated in Figure 3.

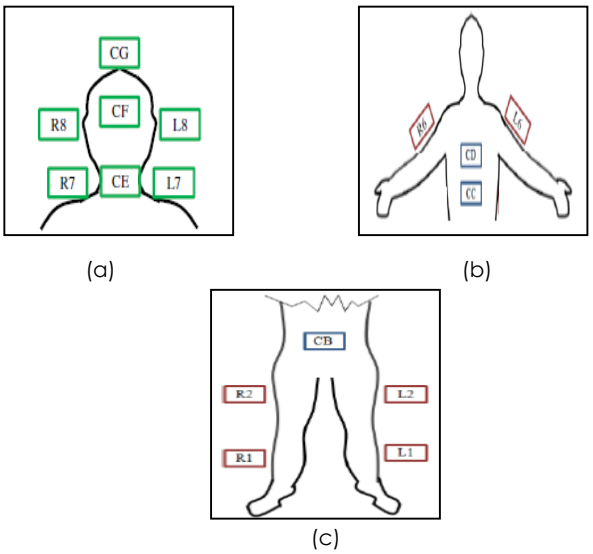


Figure 3 The radiation points measured around human body (a) Top (b) Middle (c) Bottom [18]

The data acquisition procedure was carried out under controlled environment. During measurement, the temperature of the room is maintained between 20^{0}C to 26^{0}C to allow similar relaxation to the participants and also to ensure consistency and accuracy in frequency reading. The ambient conditions are measured immediately before and after experiment [19]. The same location is used to establish reliable data [20]. In order to decrease variation of reading frequency, the participants are advised to limit their body movement.

2.2 Configuration

Throughout the measurement process, the antenna is set on the 7th segment length and placed on horizontal position to the human body. The frequencies are obtained remotely at a distances of 1 to 5 cm from body to antenna [20] and the data is collected by taking the reading of the frequency 5 times at each point at the same location. The average value will be calculated for analysis. The procedure of the experiment involves capturing frequencies of all 7 points on human upper parts shown in Figure 3. The general process of measurement was explained and the participants or the caretaker register by signing the consent form. The same procedures were repeated for middle and bottom part of human body.

2.3 Data Analysis

Data analysis is performed offline using SPSS which was used to determine the descriptive analysis to verify the data and to examine the outliers through boxplots for further analysis. Microsoft Excel was also used to plot the properties of the data analyzed.

3.0 RESULT AND DISCUSSION

In the first analysis, the boxplot diagram was used to compare the distributions of frequency between the two groups as shown in Figures 4-6. The results show the variability of frequency radiation on human body between each group, particularly in top, middle and bottom part. Based on that distribution, there are outliers on the high and low frequency for all the three segments of the body for stroke patients but no outliers at all for non-stroke participants. However, all the collected data were used for further analysis since there are no extreme outliers occured.

From visual inspection, the distribution of the collected data for stroke patients are slightly lower in frequency value as compared to non-stroke participants. Furthermore, the stroke patients have small range of frequency. For instance, L8 ranging from 214.12 MHz-548.99 MHz for stroke patients and 166.20 MHz -657.24 MHz for non-stroke participants. The mean frequency is also lower for stroke patients which is 400.96 MHz and 437.71 MHz for non-stroke participants (for L8).

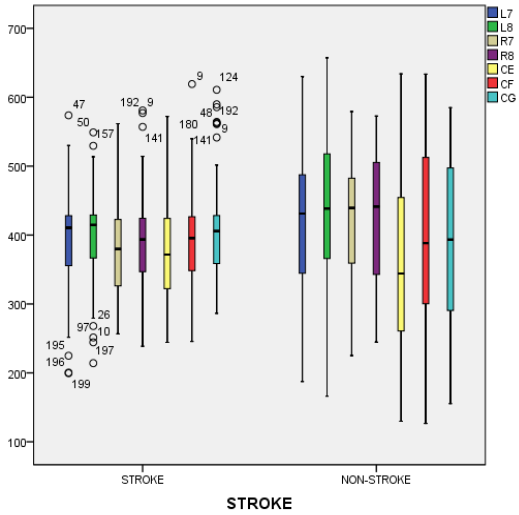


Figure 4 The human radiation frequency distribution for stroke and non-stroke: top part

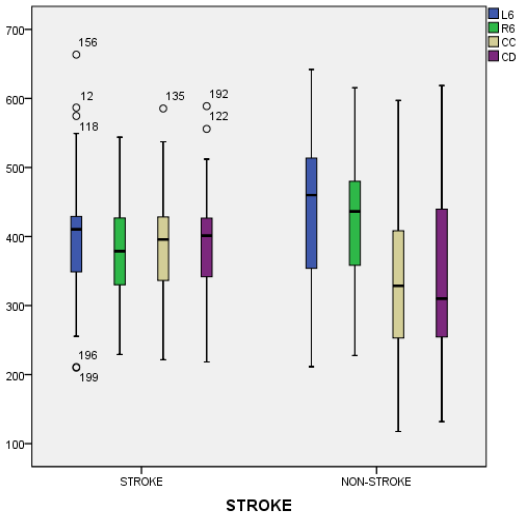


Figure 5 The human radiation frequency distribution for stroke and non-stroke: middle part

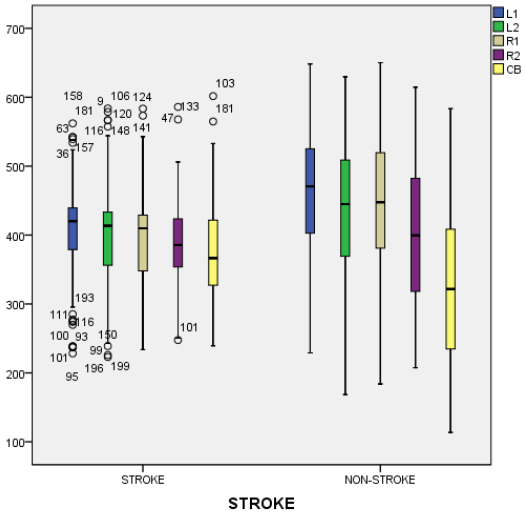


Figure 6 The human radiation frequency distribution for stroke and non-stroke: bottom part

In the second analysis, the average frequency for top, middle and bottom parts were evaluated. Figures 7-9 shows the graph for each case respectively. Figure 7 shows that the average frequency for top part of the body on the left side (L7 and L8) and right side (R7 and R8) are lower for stroke patients than non-stroke participants. However, for Chakra points (CE and CG), the average frequency are higher for stroke patients as compared to non-stroke participants except for CF whereby the reading for stroke patients and non-stroke participants are the same.

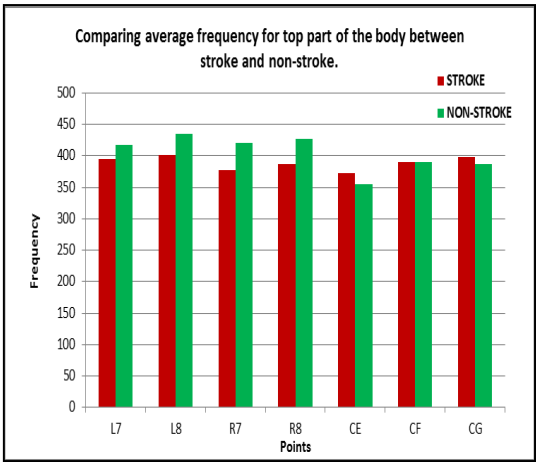


Figure 7 Comparing average frequency for top part of the body between stroke and non-stroke.

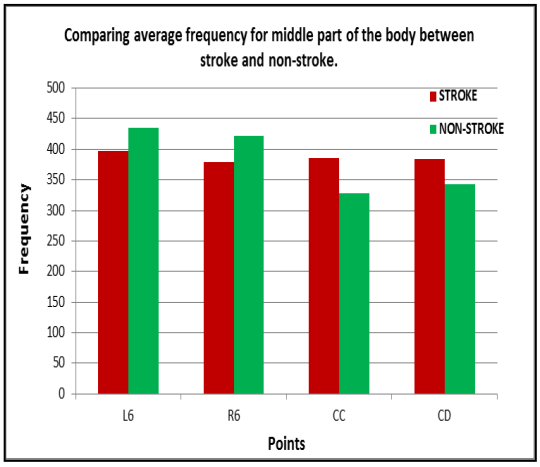


Figure 8 Comparing average frequency for middle part of the body between stroke and non-stroke.

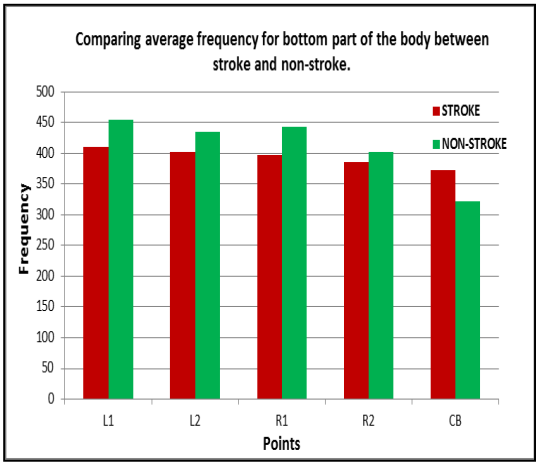


Figure 9 Comparing average frequency for bottom part of the body between stroke and non-stroke.

Similar observation are found in Figure 8 and Figure 9 which concern with the average frequency on the middle and bottopm part of the body. It shows that

the EMR for stroke patients are much lower compared to the non-stroke participants. This results is consistent for both left and right side points (L1,L2, R1 and R2). Nevertheless, the EMR on chakra part (CB) for stroke patients are higher than non-stroke participants . Thus, in general, the results from second analysis significantly shows that non-stroke participants has higher value of EMR for both right side and left side but has lower frequency for chakra system.

Consequently, the data was analysed separately between stroke and non-stroke in order to determine the strength of the relationship between variable using Pearson correlation. The two variables are considered as significant and highly linear related if correlation value r ≥ 0.5 and the sig.value p < 0.05. Table I shows the results of Pearson correlation for all body segmentation.

Table 1 Pearson correlation

Body	Pair		Stroke		Non-Stroke	
			Correlation	Sig.	Correlation	Sig.
Top	Pair 1	L7 & R7	.168	.017	.659	.000
	Pair 2	L8 & R8	.339	.000	.654	.000
Middle	Pair 1	L6 & R6	.416	.000	.614	.000
Bottom	Pair 1	L1 & R1	.187	.008	.515	.000
	Pair 2	L2 & R2	.256	.000	.379	.000

As shown in Table I, the results of Pearson correlation indicated that the non-stroke have significant strong linearly correlated between variables for the particiapants in most cases whereby r > 0.5 and p < 0.05 . For instance, in the top part for non-stroke participants (pair L7 & R7), r=0.659 and p=0.000 but for the same pair in stroke group, r=0.168 and p=0.017. However, the bottom part in non-stroke participants (pair L2 & R2) was found to be not correlated with r=0.379 an p=0.000.

For stroke patients, the correlation values were insignificant for all pairs in all segments because the r value is < 0.5 and p < 0.05. For example, in the top part pair L8 & R8, r=0.339 and p=0.000, in the middle part pair L6 & R6, r=0.416 and p=0.000 and in the bottom part pair L1 & R1, r=0.187 and p=0.008.

5.0 CONCLUSION

In conclusion, the findings significantly shows that stroke patients has lower frequency value of EMR for both right side and left side but has higher frequency for chakra system. This is true for all the three segments of the body. Furthermore, it is also shown that there is no correlation between the left and the right side frequency for the stroke patients whereas the left-right correlation values are significantly high for the non-stroke participants. This observation justify that EMR from human body can contribute to early detection for stroke.

Acknowledgement

The authors would like to express the deepest gratitude to the Ministry of Education for providing support through the scholarship, the staffs at NASAM who cooperated during data collection, Dr. Fazah Akhtar Hanapiah from Faculty of Medicine UiTM Sungai Buluh for her contributions as a medical personnel in this research, Advanced Signal Processing Research Group (ASPRG) and Biomedical Research and Development Laboratory for Human Potential, Faculty of Electrical Engineering, UiTM for their support. Special thanks go to all stroke patients who have agreed to participate in this research.

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