Ischemic Heart-Stroke: Resting ECG Changes in Patients of Duhok in Iraq

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ABSTRACT

Electrocardiography passes on information regarding the electrical function of the heart, by changing the state of its constituent waves, namely the P, QRS, and T-waves which represent one cardiac cycle. The amplitude and interval of P-QRS-T segment determine the function of heart. Cardiac arrhythmia demonstrates a state of abnormal electrical activity in the heart which is a risk for humans. Currently onsets of cerebrovascular disease of ischemic nature have electrocardiographic changes, in those patients who had no primary heart disease. We estimated the prevalence of electrocardiographic changes for being of noteworthy one. The aim of this study presents analyses cardiac disease in electrocardiogram (ECG) signals for cardiac arrhythmia which leads to ischemic heart - stroke utilizing investigation of resulting ECG normal and abnormal wave forms. In results 75 of Patient group about (58.67%) were males and (41.33%) were females, their mean of age (62 years). The control group of patients was consisting of (52%) males and (48%) females mean age was (61.5 years). Frequency of electrocardiographic changes of the study sample was (58.67%), while with the control group of the patient was (25.33%).

Keywords: Arrhythmia, Ischemic heart, Resting ECG, Ischemic stroke, ST depression

INTRODUCTION

Cardiovascular diseases are the main source of death around the world [1] and affects financial status [2]. The high morbidity and mortality related with these diseases makes diagnosis and administration of these conditions basic in clinical practice. Electrocardiograms are important examinations for evaluating cardiovascular disease; earlier learning of the predominance of abnormalities in the population studied is valuable for interpreting ECG findings [3]. Furthermore, electrocardiographic irregularities are autonomously connected with the incidence of coronary heart disease and with poor cardiac disease results [4]. The predominance of electrocardiographic irregularities changes with age and sex [3,5,6].

Recently, numerous investigations have concentrated on the unique aspects of cardiac disease in women, in order to improve its finding and treatment [4,7,8].

An electrocardiogram (ECG) is generally utilized for observing rhythm of heart. The resting ECG is the most widely utilized cardiovascular diagnostic test. Approximately, 75 million are performed out every year in the United States alone, and probably twice around the world [9].

ECG changes appear early in the course of cardiovascular diseases, and usually include alterations such as sinus tachycardia, QTc prolongation, QT dispersion, changes in heart rate variability, ST-T changes, and left ventricular hypertrophy (LVH). These progressions and others, recognized with the utilization of a resting ECG, frequently together with an activity ECG, are utilized to identify silent ischemia, assess prognosis, and predict future risk [10]. Since the ECG is a non-invasive and generally simple test to perform, it is utilized as a part of arrangement of examinations led as a component of the yearly clinical assessment of symptomatic populace around the globe [11-13]. Dogan, et al., reported that ECG abnormalities in ischemic heart-stroke are about 65% of the total patients with no primary heart disease [14].

The aim of this study is to demonstrate that the electrocardiographic changes in ischemic heart-stroke of no primary heart disease in requirement for reconsideration of the heart condition.

PATIENTS AND METHODS

A 12-Lead resting ECG was done on all subjects utilizing Cardiofax S ECG-1250K for High Level 12-Lead analysis. All tracings were translated by a similar person, who is a cardiologist who didn't know about the subject's medical history. The following ECG abnormalities were specifically looked for: ST-segment elevation or depression, T-wave aberrations (inversion or tall T-wave), bundle branch block, left ventricular hypertrophy (LVH), arrhythmias, prolonged QT-wave and other changes.

Study sample of 75 patients which had been admitted to Duhok Azadi teaching hospital between 1st November 2016 and 1st October 2017. Stroke regarding to World Health Organization criteria as rapidly developing sign of global or focal disturbance of cerebral function [15]. The diagnosis and subtype of stroke was affirmed by computerized tomography of the brain.

Inclusion Criteria

- Cerebrovascular illness.
- Admission first 24 hours of the event.
- Electrocardiogram done on 24 hours of admission.
- Age of the patient is 45 years and older.

Exclusion Criteria

- Previous history of cardiac disorder.
- Hemorrhagic stroke or head trauma.
- Liver, kidney, and metabolic disorder.
- Age more youthful than 45 years old.
- Basilar artery insufficiency.
- Stroke for more than 24 hours onset.

The study sample included 75 patients with no stroke background of particular age range who were admitted within the above-mentioned period.

RESULTS AND DISCUSSION

Patient group and control group are distributed according to the gender where about 41.33% of patients were female and 58.67% were male with mean age of 62 years, while in the control group, 48% were female and male were about 52% with mean age of 61.5 years as shown in Table 1.

Table 1 Gender wise distribution of study group and control group

Gender	Study Group		Control Group	
	n	%	n	%
Male	44	58.67%	39	52.00%
Female	31	41.33%	36	48.00%
Total	75	100.00%	75	100.00%

Frequency of electrocardiographic changes in study group having abnormal trace of electrocardiography was observed in 44 patients (58.67%), while 19 patients out of 75 of control group having abnormal electrocardiographic trace as shown in Table 2.

Table 2 Electrocardiographic findings among study group and control group

ECG	Study Group		Control Group	
	n	%	n	%
Abnormal	44	58.67%	19	25.33%
Normal	31	41.33%	56	74.67%
Total	75	100.00%	75	100.00%

Table 3 demonstrates the frequency of changes in the electrocardiography for both study group and control group: T inversion is more common followed by ST segment depression in the study group patients, while for the control group patients, it was less with T inversion about 16% and ST depression about 1.33%.

Table 3 The frequency of ECG changes among study group and control group

ECG Changes	Study Group		Control Group	
	n	%	n	%
MI – Pathological Q wave with or without ST and T changes	8	10.67%	1	1.33%
IHD - without Q waves	1	1.33%	0	-
Atrial fibrillation	4	5.33%	0	-
Left ventricular hypertrophy	3	4.00%	1	1.33%
T wave inversion	14	18.67%	12	16.00%
ST segment depression	9	12.00%	1	1.33%
ST elevation	5	6.67%	4	5.33%
Total	44	58.67%	19	25.33%

Normal functioning heart is controlled by central nervous system [16]. Central nervous system manages the heart rate, vasomotor tone, blood pressure and cardiac output [17]. An arrhythmia changes the rhythm of ischemic heart-stroke in 51% [18] and their result is concomitant with our study result. Reporting frequency of new electrocardiographic changes in ischemic heart-stroke (15-30%) [19], and their result is comparatively less than our study group result. Cardiac arrhythmia is common (51%) than ischemic heart-stroke and this result agrees with our study results [20]. Generally electrocardiographic changes are T inversion followed by ST depression as an indication of ischemia which is mostly identified with catechol amine releases. This difference in the electrocardiographic changes is because of the definition and criteria which we rely on it [21]. These changes are of significant value for more reconsideration of the heart condition.

Criteria for Definition of Electrocardiograph Trace Changes

- A 12-lead ECG with standardization of (10 mm/mv) of speed (25 mm/s).

- ST-segment depression: as sloping or flat depression (1 mm), elevation (1 mm). Elevation in chest leads (v1, v2 2 mm) significant.

- Q-wave assessed in lead (1, 2, AVF).

- T-wave normally up right normal depression of less than (0.1 mm) abnormal.

- U-wave characterized as negative wave with progressively (0.1 mv depth positive u wave when higher than 25% of R) [21].

CONCLUSION

It can be concluded that the correlations of age and sex with electrocardiographic abnormalities that were made through the present examination may help towards expanding the prescient estimation of ECGs and contribute towards diagnosing and along these lines overseeing numerous regular cardiovascular diseases within primary care. Electrocardiographic abnormalities are common among patients with early onset ischemic heart-stroke in spite of normal functioning heart, transcendentally as T inversion followed by ST depression and these changes are significant for these patients. Cardiac abnormality, including coronary flow disturbance may assume a role in causation of ischemic heart-stroke and it is essential as prognostic measures.

DECLARATIONS

Consent to Participate

Informed consent was obtained from all the participants.

Conflict of Interest

The authors have disclosed no potential conflicts of interest, financial or otherwise.

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