



ECG AND 2DECHO CHANGES IN STROKE PATIENTS

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ABSTRACT **OBJECTIVES:** To study the different changes in ECG and echocardiographic patterns in the cases of cerebrovascular accidents and to assess whether these different changes have got any prognostic significance in these cases.
METHOD: 100 patients of acute stroke were considered and ECG and 2D echo of these patients was done within 24 hours of admission. In hospital follow-up was done to know the prognosis of all the patients.
RESULTS: ECG abnormalities noted among cerebral infarct group were presence of U- waves (51.47%), prolonged QTc (36.76%) were most common followed by T-wave inversion (30.88%), and ST segment depression (30.88%). In cases of hemorrhagic stroke, ST depression (56.26%) and U-wave (56.26%) were the most common abnormalities. LV dysfunction was the most common 2D echo abnormality in both the stroke types – 23.53% and 56.26% i.e., in infarct and hemorrhage groups respectively.
CONCLUSION: ST segment depression, QTc prolongation and U-waves are the common ECG abnormalities in hemorrhagic strokes. QTc prolongation and U-waves are the common ECG abnormality in ischemic stroke. LV dysfunction is the most common 2D echocardiographic abnormality in stroke patients. ECG abnormalities in stroke patients do not have any prognostic significance. LV dysfunction has prognostic significance in predicting mortality in CVA.

KEYWORDS : Stroke, CVA, ECG, 2Decho, Ischemic, Hemorrhagic Stroke, Lv Dysfunction, T inversions, QT Prolongation.

INTRODUCTION:

Cerebrovascular accident (CVA) or stroke is the most common life threatening disorder. It is the third leading cause of death in the developed countries after cardiovascular disease and cancer

Cerebral infarction is responsible for about 80% of all first ever in lifetime strokes. Primary intracerebral haemorrhage (PICH) for 10 % and subarachnoid haemorrhage for 5%.

The incidence of stroke worldwide is 179 per 1,00,000 population in various parts. In western countries overall prevalence rate is 794 per 1,00,000 population.

CVA or strokes are capable of causing crippling morbidity in young as well as elderly individuals. They also have marked social, psychological and economic implications. Due to its wide prevalence and its high cost in economic terms as well as human disability, cerebrovascular accidents have evoked much interest in medical fraternity.

Many studies have shown CVA associated with ECG changes and wall motion abnormalities on 2D echo. The changes of ECG in CVA were repeated in many studies. Changes occurring in ECG following stroke were T-wave, U- wave, ST - segment, QT - interval and various arrhythmias, these ECG changes may resemble those of myocardial ischemia or sometimes myocardial infarction.

Along with ECG changes many studies have shown wall motion abnormalities on 2D echo following stroke, especially subarachnoid hemorrhagic. Hence study was undertaken to know the ECG and 2D echocardiographic changes in different types of cerebrovascular accidents. To know whether such changes have any prognostic significance.

AIMS AND OBJECTIVES:

- To study the different changes in ECG and Echocardiographic patterns in the cases of cerebrovascular accidents.
- To assess the different changes have got any prognostic significance in these cases.

MATERIALS AND METHODS:

Sample size : Study taken in 100 patients admitted in the General medicine department as inpatients.

Study method : Prospective study.

Study duration : Done among the inpatients admitted between July 2017 to July 2018.

INCLUSION CRITERIA:

- Cases of CVA (CT scan proved) admitted within 72 hrs after onset of stroke were selected for the study.
- Both ischemic and hemorrhagic stroke patients were included.
- Both sexes included.

EXCLUSION CRITERIA:

- Patients admitted with CVA beyond 72 hrs after onset of stroke were excluded.
- Traumatic cases producing neurological deficits , infections and neoplasticism cases producing CVA.
- CVA cases with known underlying cardiac diseases, which produce ECG and 2D echocardiographic changes.

METHOD OF COLLECTION OF DATA:

Detailed history and examination of the patients were done. CT was done along with routine blood investigations. After confirming stroke, ECG and 2D echocardiography were done to all the patients, who come under the study. All the data was collected and analyses and tabulated.

RESULTS:

During the period of July 2017 to July 2018, About 100 cases of stroke patients were selected for the present study who met the inclusion and exclusion criterion, were analyzed with regard to ECG and 2D echo changes and the following observations were noted.

Table -1 : Relationship of CVA with ECG and 2D Echo changes ECG CHANGES IN STROKE PATIENTS

ECG CHANGES	ISCHEMIC (N=68)	HEMORRHAGIC(N=32)
QTC prolongation	36.76%	50.00%

T-wave inversion	30.88%	28.13%
ST Segment depression	30.88%	56.26%
U waves	51.47%	56.26%
Tachycardia	35.29%	50%
Bradycardia	-	6.25%

In the study QTc prolongation was seen in 36.76% of ischemic stroke patients and 50% of hemorrhagic stroke patients. T- Wave inversion was seen in 30.88% of ischemic stroke patients and 28.13% of hemorrhagic stroke patients. ST segment depression was seen in 30.88% of ischemic stroke patients and 56.26% of hemorrhagic stroke patients. U waves were seen in 51.47% of ischemic stroke patients and 56.26% of hemorrhagic stroke patients. Tachycardia was seen in 35.29% of ischemic stroke patients and 50% of hemorrhagic stroke patients. Bradycardia was seen in 6.25% of hemorrhagic stroke patients.

Table 2: 2DECHO CHANGES IN STROKE PATIENTS

ECHO CHANGES	ISCHEMIC (N=68)	HEMORRHAGIC (N =22)
LV dysfunction	23.53	56.26
LA thrombus	-	-
Mitral valve abnormality	20.59	-
Aortic valve abnormality	4.41	-
Normal	55.88	25.00

In the present study LV dysfunction was seen in 23.53% of ischemic stroke patients and 56.26% of hemorrhagic stroke patients. Mitral valve abnormalities were seen in 20.59% of ischemic stroke patients. Aortic valve abnormalities were seen in 4.41% of ischemic stroke patients. Normal 2D echo findings were found in 55.88% of ischemic stroke patients and 25% of hemorrhagic stroke patients.

DISCUSSION:

A hospital based prospective study was done to know the ECG and 2DEcho changes had any prognostic significance in stroke patients.

The percentage of normal ECGs in patients who survived stroke is 35%, while 22.72% succumbed to stroke, 79% of stroke survivors had abnormal ECG, while 77.27% of patients who died of stroke had abnormal ECG ($p>0.5$) and is statistically insignificant.

Among the stroke survivors 56.41% had normal 2D Echo findings while 43.59% had abnormal 2D Echo study, while among patient died due to stroke had 90.91% abnormal 2D Echo finding, where in only 9.09% abnormal 2D Echo findings so the mortality in abnormal 2D Echo was high and was statistically significant ($p<0.001$).

CONCLUSION:

- ST segment depression, QTc prolongation and U are the common ECG abnormalities in hemorrhagic strokes.
- QTc prolongation and U waves are the common ECG abnormality in ischemic stroke.
- LV dysfunction is the most common 2D Echo abnormality in stroke patients.
- ECG abnormalities in stroke patients do not have any prognostic significance.
- LV dysfunction has prognostic significance in predicting mortality in CVA.

SUMMARY:

This is a hospital based prospective study done in ASRAM during period of 2017-2018 which comprised of 100 patients.

- Stroke was most common in 5th and 6th decade. (55%)
- Males had higher preponderance among all stroke patients.
- Hypertension was the most common risk factor, followed by smoking, past history of stroke and diabetes
- Headache was presenting complaint in 25% of patients in infarct group and 65.62% of patients in hemorrhage group.
- Abnormal ECG changes were common among hemorrhagic patients compared to infarct patients.
- ST segment depression and U waves followed by QTc prolongation were the most common abnormalities in hemorrhage group.
- U wave was most common ECG finding among infarct group followed by QTc and T wave inversion.

- 2D Echo abnormalities were more common among hemorrhage group than in infarct.
- LV dysfunction was the most common abnormality noted in both groups i.e infarct(23.53%) and hemorrhage(56.26%) followed by mitral wall and aortic abnormality among infarct group.
- None of the ECG changes had much significance on mortality and was statistically insignificant ($p>0.05$)
- LV dysfunction showed significant mortality in stroke patients and was statistically significant ($p<0.001$)

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