INTRODUCTION: Physicians are confronted on having ECG in patients with acute stroke as it can mimic that of myocardial infarction/ischemia. They should be aware of these changes taking place in patients with acute stroke and not due to myocardial infarction/ischemia. The objective of the present study was to study ECG changes in patients with acute stroke.

MATERIAL AND METHODS: A hospital based prospective study was carried out for a period of one year at medicine department (SRG Hospital, JMC Jhalawar). A total of 100 patients were included who were eligible for the present study as per the inclusion and exclusion criteria. Detailed clinical examination, history, lipid profile, cardiac profile, RFT, LFT, Serum electrolytes, Prop. T, blood pressure, addictions, RBS and ECG were done for all selected patients. The data obtained was analysed using appropriate statistical methods.

RESULT: Out of 100 cases, 60 were ischemic and 40 were haemorrhagic. The ECG changes were noted in 78 patients. Among ischemic group, T wave inversion (38.3%), and sinus tachycardia (31.7%) were the most common abnormalities, followed by QTc prolongation and ST depression (30%) and presence of U waves (25%). In case of haemorrhagic group, T wave inversion (32.5%) and U waves (27.5%) were most common followed by ST segment depression and QTc prolongation (25%). The mortality was high in patients with abnormal ECG (15.4%) in contrast to those who had normal ECG (9.09%).

CONCLUSION: ECG changes occur very commonly in acute cerebrovascular accidents. The major ECG abnormalities were ST-T changes, QTc prolongation and positive U waves. The incidence of mortality is higher in stroke patients with ECG abnormalities.

AIMS OF THE STUDY: -
- To study risk factors and the occurrence of symptoms in stroke.
- To study the incidence of ECG changes in patients with acute stroke.
- To study the nature and types of ECG changes in different types of strokes.
- To find out whether there is any prognostic significance for these abnormal ECG findings in patients with acute stroke.

MATERIAL AND METHODS: -
It is a prospective hospital based study conducting at medicine department (SRG Hospital, JMC Jhalawar) during period from July 2018 to July 2019. For the purpose of study following inclusion and exclusion criteria was used to select the study patients,
- Inclusion Criteria: Cases of cerebrovascular accident and admitted within 72 hours.
- Exclusion Criteria: Stroke cases which came after 72 hours, the individuals with head injury and known cardiac, hepatic and renal diseases.

Thus total 100 cases of cerebrovascular accident were enrolled in the study by using the above mentioned inclusion and exclusion criteria. The diagnosis of CVA was confirmed by using following criteria:
- Temporal profile of the clinical syndrome
- Evidence of focal brain damage/disease
- Clinical setting

A 12 Lead Electrocardiogram was taken for all the cases within 24 hours of admission and subsequently repeated on 3rd day, 5th day and 30th day for follow up. CT scan brain was taken and all patients were subjected to following inves ti...
Clinical Features (N=100)

Table 1: Distribution of Study Subjects according to the Clinical Features (N=100)

<table>
<thead>
<tr>
<th>Clinical Features</th>
<th>Total (n=100)</th>
<th>Haemorrhagic (n=40)</th>
<th>Ischaemic (n=60)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemiplegia</td>
<td>79</td>
<td>28 (65.5)</td>
<td>53 (88.3)</td>
<td>0.024*</td>
</tr>
<tr>
<td>Headache</td>
<td>21</td>
<td>17 (42.5)</td>
<td>4 (6.7)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Vomiting</td>
<td>11</td>
<td>8 (20.0)</td>
<td>3 (5.0)</td>
<td>0.018*</td>
</tr>
<tr>
<td>Seizures</td>
<td>6</td>
<td>3 (7.5)</td>
<td>3 (5.0)</td>
<td>0.606</td>
</tr>
<tr>
<td>Loss of Consciousness</td>
<td>23</td>
<td>15 (37.5)</td>
<td>8 (13.3)</td>
<td>0.005*</td>
</tr>
<tr>
<td>Drowsy</td>
<td>19</td>
<td>18 (45.0)</td>
<td>11 (18.3)</td>
<td>0.835</td>
</tr>
<tr>
<td>Neck Stiffness</td>
<td>7</td>
<td>7 (17.5)</td>
<td>0</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

Chi-Square Test, P Value * Significant

Graph 1: Distribution of Risk Factors

Graph 2: Distribution of ECG Abnormalities

RESULTS:

- The mean age was 62.09±12.40 years. The incidence of stroke in the present study was more common in the age group 61-70yrs (32%), followed by 51-60yrs (31%).
- Out of 100 patients in the study group, 72 were male and 28 were females. There was male preponderance compared to females making male:female ratio of 2.6:1.
- The incidence of ischemia (60%) was more common when compared to haemorrhage (40%).
- In case of ischemia out of 60 patients, 36 patients (60%) were male and 24 (40%) patients were female, and in case of haemorrhage 36 patients (90%) were male and 4 patients (10%) were females out 40 patients. This result was highly significant (p value = 0.001).
- The abnormalities of ECG were common in stroke patients. ECG changes were seen in 78/100 patients. In the ischemic group, ECG changes were seen in 47/80 patients (78.3%). Among haemorrhagic group, 31/40 patients (77.5%) had ECG changes. The abnormalities were more common in ischemic group (78.3%) compared to haemorrhagic group (77.5%).

DISCUSSION:

Out of 100 patients, 72 were males and 22 were females. The male:female ratio was 2.6:1 which is comparable to other studies done by Anand et al (1.7:1) and Nagaraja et al (2.1:1). The lower incidence of stroke in women may be attributed to genetic factors, positive effects of estrogen on the cerebral circulation or to lower blood pressure values compared to men. Moreover ischemic heart disease, peripheral artery disease and cigarette smoking are more prevalent among men.

The mean age in the study group was 62.09±12.40 years. It is comparable to other studies done by Truelsen et al (64.2 years), Sridharan et al (67 years) and Kim et al (65.2 years). In the present study, hypertension was present in majority of the cases i.e., 81%, which is comparable with that found in the studies of Pandiyani et al (71.9%) and Watila et al (80.33%). Next commonest risk factors were smoking (33%) and diabetes mellitus (31%), which are comparable with what found in the study of Watila et al which was 10%. Prospective studies in Framingham have shown that hypertension is the most common risk factor for stroke. The risk increases with elevated systolic and diastolic values, the relationship being almost linear and independent of age and sex. Control of hypertension with anti-hypertensive drugs reduces the risk of stroke.

In this study, 60% of the patients had ischemic stroke, which is comparable with that found in the studies of Kuruvilla et al (67.3%) and Kumar et al (56%) respectively. The most common cause for ischemic stroke is atherosclerosis of the arteries, large and small that supply the brain.40% had haemorrhagic stroke in the present study that is comparable with 37.9% and 44% in the Kuruvilla et al and Kumar et al study group respectively.

A vast majority of stroke patients demonstrated ECG changes in the current study (78%). This conforms to the previous studies of Goldstein and Bozluolclay where ECG changes were demonstrated in 92% and 62.1% of patients respectively.

Increased QTC in our study was seen in 28% of cases. This is similar to observation in a large scale study done by Goldstein where it was seen in 32% of cases. T-wave inversion was seen in 15% by Goldstein et al where as in this study it is
36%. ST-segment depression was seen in 13% in Goldstein while in the present study it is 28%. U-wave was seen in 28% in Goldstein et al, while in our study it is seen in 26%. Tachycardia was seen in 2% in Goldstein et al while in this study it is 28%. Bradycardia was seen in 8% in Goldstein et al, while in the present study it is 8%.

A similar study was done by Familoni et al in 2008 where QTc prolongation was seen in 28% of the cases, T wave inversion in 21.8%, ST segment depression in 29.7%, U wave in 9.3% and arrhythmia in 34.4% of the cases in study group. Various other studies showed highly variable values and this may be due to the fact that ECG changes occurring in stroke are highly variable over time and cannot be standardized unless continuous ECG monitoring is done.

CONCLUSION:-
• Cerebrovascular accident is a major cause of morbidity and mortality.
• Incidence of cerebrovascular accident or stroke increases with the advancement of age
• Demographic variables like age, gender; modifiable factors like hypertension, Diabetes mellitus, smoking, alcohol and hyperlipidemia are risk factors for the development of stroke.
• ECG changes occur very commonly in acute cerebrovascular accidents.
• The ECG changes occur independent of the nature of stroke i.e they are equally seen in ischemic and hemorrhagic group.
• The major ECG abnormalities were ST-T changes, QTc prolongation and positive U waves.
• The incidence of mortality is higher in stroke patients with ECG abnormalities.
• Hence to increase the survival period and reduce the morbidity and mortality in patients of cerebrovascular accidents, the prognostic factors should be identified and attempts should be done to control diabetes mellitus, hypertension.
• ECG abnormalities should be identified and specific pathology like Ischemia and Haemorrhage should be treated.
• 24 hours Holter monitoring should be done to all patients admitted with stroke to look for any ECG abnormalities.

REFERENCES:-