THE STUDY ON STROKE IN HIV PATIENTS
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ABSTRACT

BACKGROUND
Stoke and HIV infection are both common medical problems in day-to-day clinical practice. According to the few studies done1 in India, the prevalence of stroke in general population in India is 205 cases/1 lakh population, common in elderly people and of them 25% are seen in the young individuals. HIV infection is an emerging aetiology for stroke in the young.

MATERIALS AND METHODS
This is a prospective, observational, hospital-based study involving 100 inpatients' who were admitted in medical and neurology wards with acute stroke with HIV infection to Government General Hospital, Kakinada, from October 2012 to September 2014. Before the commencement of the study, permission was obtained from Institutional Review Board, Ethics Committee, Rangaraya Medical College and GGH. All enrolled patients were informed about the nature of the study and their rights to refuse. Their informed written consent was taken before including them in the study.

RESULTS
In studies done by M. Mlay et al2, Felicia C. Chow et al3, percentage of diabetes was 22.1% and 11.1%, respectively. Brown et al and Ovbiagle et al4 showed that the use of Highly Active Antiretroviral Therapy (HAART) has been associated with several metabolic complications, which is a risk factor for cerebrovascular events. Myocardial infarction is the most frequent vascular event in HAART usage by causing hyperlipidaemias and premature atherosclerosis, Amelia Noguera Pinto et al.5 There were a total of 30 deaths altogether in the study (30% mortality) with 3 cases out of the 12% haemorrhagic strokes (27.27% mortality) and 27 deaths out of the 82% cases of ischaemic stroke (33.33% mortality). There is no statistically significant difference in the mortality rates between ischaemic and haemorrhagic strokes with a p value of 1.0.

CONCLUSION
HIV infection puts the patients at risk for cerebrovascular events is now an established association. Stroke is being reported more often as first presentation of HIV infection. Thus, it is worthwhile to screen for the HIV in routine workup for stroke in young and after confirmation of HIV infection workup should further proceed to establishing an aetiopathogenesis for stroke in HIV.

KEYWORDS
Stroke, HIV.

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BACKGROUND
Stoke and HIV infection are both common medical problems in day-to-day clinical practice. According to the few studies done1 in India, the prevalence of stroke in general population in India is 205 cases/1 lakh population, common in elderly people and of them 25% are seen in the young individuals. HIV infection is an emerging aetiology for stroke in the young.

Neurological disease is the first manifestation of symptomatic HIV infection in 10% to 20% of persons and about 60% of patients with advanced HIV disease. HIV infection causes neurological manifestations in 55% to 90% of the cases in which 30% are asymptomatic, 35% having peripheral nerve involvement and remaining patients having cerebrovascular accidents, focal neurological deficits, seizures and meningitis.6 HIV was strongly associated with both ischaemic and haemorrhagic stroke. Several possible mechanisms have been hypothesised to account for stroke in association with HIV such as prothrombotic state7 or a covert HIV-induced vasculopathy.

Various disorders that predispose the hypercoagulable8 state have been reported in HIV infection like antiphospholipid antibodies, lupus anticoagulant, deficiencies of protein C, protein S, heparin cofactor II antithrombin, increased concentrations of von Willebrand factor and D-dimers. Increased platelet activation with respect to antiphospholipid antibodies and anticardiolipin antibodies have been observed in nearly 10% of HIV persons.
MATERIALS AND METHODS
This is a prospective, observational, hospital-based study involving 100 inpatients who were admitted in medical and neurology wards with acute stroke with HIV infection to Government General Hospital, Kakinada, from October 2012 to September 2014. Before the commencement of the study, permission was obtained from Institutional Review Board, Ethics Committee, Rangaraya Medical College and GGH. All enrolled patients were informed about the nature of the study and their rights to refuse. Their informed written consent was taken before including them in the study.

Inclusion Criteria
- Hundred patients of stroke with HIV infection presenting first time were included in the study.

Exclusion Criteria
- Patients with head injury, intracranial space occupying lesion, cortical venous thrombosis.
- Patients age less than 14 years were excluded from the study.
- Patients with previous history of stroke were excluded from the study.
- Patients who refused to give informed consent were excluded from the study.

Data Collection
Patients were registered as a case of stroke with HIV only when they fulfilled the following criteria.
1. WHO criteria (modified) for stroke- A focal or global disturbance of cerebral functions persisting for more than 24 hours with no apparent cause other than vascular.
2. HIV confirmed by ELISA.
3. CT scan of head showing the evidence of stroke.

OBSERVATIONS AND RESULTS
The present study was carried out in 100 consecutive stroke with HIV patients admitted to Government General Hospital, Kakinada.

Sex Distribution

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>56</td>
<td>56%</td>
</tr>
<tr>
<td>Female</td>
<td>44</td>
<td>44%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 1. Showing Distribution of Stroke in HIV between Male and Female

In our study group, 56% (n=100) of patients were males and 44% were female, male-to-female ratio was 1:3:1 and the mean age for stroke was 39.29 + 1.97 years and showed males were more effected.

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>21-30</td>
<td>26</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>31-40</td>
<td>30</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>41-50</td>
<td>24</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>51-60</td>
<td>13</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>61-70</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2. Age Distribution

In our study, 26% patients were in between the age of 21-30 years age group, 30% of the patients were in between the age of 31-40 years age group, 24% of the patients were in between the age of 41-50 years age group.

56% (n=100) of the patients were in between the age of 21-40 years age group and showed stroke is common in young age group with a mean age 39.29 ± 10.97 (SD).

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>60</td>
<td>49</td>
<td>11</td>
</tr>
<tr>
<td>Smoking</td>
<td>57</td>
<td>51</td>
<td>11</td>
</tr>
<tr>
<td>Drug addition</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Married multipartners HIV status</td>
<td>90</td>
<td>50</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 3. Showing Traditional Risk Factors

1. In our study, 60% (n=100) patients consume alcohol in which males were 66%.
2. 57% (n=100) 57% habituated to smoking in which males were 89%.
3. 5% (n=100) patients were drug abusers in which males were 80%.
4. 90% (n=100) patients were married and had multipartner high behaviour in which 55.55% were males, this study showed that males had high traditional risk factors.

<table>
<thead>
<tr>
<th>Types</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic</td>
<td>82</td>
<td>46</td>
<td>36</td>
</tr>
<tr>
<td>Haemorrhagic</td>
<td>18</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>56</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 4. Showing Specific Risk Factors for Stroke in HIV

1. In our study, 30% of the patients had hypertension in which 56% were males.
2. 31% of the patients had diabetes in which 64.51% were males.
3. 5% had heart diseases in which 60% were females.
4. 41% (n=100) were using HAART in which 53.65% females.
5. 28% (n=100) were using ATT in which 64.28% were male patients.
6. 6% (n=100) had dyslipidaemia in which 66.66% were females.
7. 2% (n=100) had hypercoagulable state in which all were males.

The show that most of the patients 60% had high-risk factors for stroke.

<table>
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<th>Female</th>
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<td>8</td>
</tr>
<tr>
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<td>100</td>
<td>56</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 5. Showing Ischaemic vs. Haemorrhagic Stroke


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In our study, 82% (n=100) patients had ischaemic stroke in which 56.09% were males.

2. 18% (n=100) patients had haemorrhagic stroke in which 55.55% were male patients.

This shows that ischaemic stress were more common than haemorrhagic.

Table 6. Showing Incidence of Opportunistic Infections

<table>
<thead>
<tr>
<th>Opportunistic Infection</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxo</td>
<td>15</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Cryptococcus</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>HCV</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>HBsAg</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>TBM</td>
<td>18</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 7. Showing Stroke Incidence Related to CD4 Count

In the present study, 48% (n=100) of the patients had CD4 count less than 200 cell/cu mm, 44% had CD4 in between 201-300 cells/cu mm and 8% of the patients had more than 300 cell/cu mm.

Most of the patients had low CD4 count. This shows that underlying severity of HIV infection.

Table 8. Showing Outcome of Patients in Relation to Glasgow Coma Scale

In the present study, 30% (n=100) of death occurred. 50% of the patients were died when the Glasgow coma scale was less than 3 at the time of admission.

This shows that Glasgow coma scale with a low score at the time of admission is a good predictor for outcome.

Table 9. Ischaemic Stroke in Relation to Age Group

In the present study, (n=100) 82% of the patients had ischaemic stroke in which 56.09% were male patients.

2. 63.41% (n=100) patients had stroke in the age group between 20-40 years of age. This showed that ischaemic stroke were seen in the younger in these patients.

Table 10. Death in Relation to Age Group

In the present study, 30% (n=100) patients died in which 50% were males.

2. 60% deaths occurred in the age group between 31-50 years. This showed that the mortality was seen in younger age group.

DISCUSSION

In the present study, 100 patients admitted with stroke with HIV were studied.

1. In our study, 56% were male patients and remaining were females.

2. 63% patients were males. This shows that men with HIV were most affected with stroke than women with HIV with male-to-female ratio of 1:3:1. This finding of male predominance was comparable with other studies.

Hypertension

E. Zijlstra et al13 showed hypertension was associated with an increase in the incidence of stroke in HIV patients.
Diabetes
In the present study, 31% (n=100) of the patients were suffering with diabetes. Males were 20 in number and females were 11 in number, this figure correlates with many of the other studies.

Mortality among diabetes was 51%, so diabetes has poor outcome (p value 0.0069).

In studies done by M. May et al2, Felicia C. Chow et al,3 percentage of diabetes was 22.1% and 11.1%, respectively.

Brown et al and Ovbiagie et al4 showed that the use of Highly Active Antiretroviral Therapy (HAART) has been associated with several metabolic complications, which is a risk factor for cerebrovascular events.

Myocardial infarction is the most frequent vascular event in HAART usage by causing hyperlipidaemias and premature atherosclerosis, Amelia Nogueria Pinto et al.5

There were a total of 30 deaths altogether in the study (30% mortality) with 3 cases out of the 12% haemorrhagic strokes (27.27% mortality) and 27 deaths out of the 82% cases of ischaemic stroke (33.33% mortality). There is no statistically significant difference in the mortality rates between ischaemic and haemorrhagic strokes with a p value of 1.0.

Table 11. Showing Mortality

<table>
<thead>
<tr>
<th>Study</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. May et al2</td>
<td>28.9%</td>
</tr>
<tr>
<td>Pinto et al5</td>
<td>39%</td>
</tr>
<tr>
<td>Present study</td>
<td>30%</td>
</tr>
</tbody>
</table>

CONCLUSION
HIV infection puts the patients at risk for cerebrovascular events is now an established association. Stroke is being reported more often as first presentation of HIV infection. Thus, it is worthwhile to screen for the HIV in routine workup for stroke in young and after confirmation of HIV infection workup should further proceed to establishing an aetiopathogenesis for stroke in HIV.

Large population-based age and sex matched and outcome studies are needed to strengthen the aetiological association as well as throw light on grey areas like impact of ART on HIV associated stroke and uses of antiplatelets.

The most common presenting age of the patients is in between 30-40 years, which indicates high-risk behaviour of the young people. Sex education regarding HIV transmission, progression and complication of the disease must be given high priority.

HIV patients should be monitored regularly and HAART therapy should be started as early as possible depending on the necessity according to the guidelines to avoid complications of HIV infection.

Those who present with stroke must be provided given intensive care to reduce the mortality. Low CD4 count less than 200 cell/cu mm is a major risk factor for stroke in the present study in both sexes.

Prevention is better than cure. Every care should be taken to diagnose and treat opportunistic infection, which are the major cause of the stroke.

REFERENCES