Abstract: Aims of this morphometric study was to analyze the size of third ventricle in relation to the dimension of diencephalon in humans. Ventricular size of males and females was compared. Changes in normal ventricular size with the corresponding changes in the dimension of diencephalon during ageing was also studied and statistically analyzed. The CT images of 112 adult individuals (Age Group 21-60) and 88 ageing individuals (Age above 61) was studied in both males and females. This study suggests that there is negative co-relation of age with dimensions of diencephalon and diencephalon volume is reduced with age. Also there is positive co-relation of age with dimensions of third ventricle and the volume of the third ventricle is enlarged with physiologic ageing.

Key words - Diencephalon (thalamus), Third ventricle, CT images.

Introduction
Structure of human brain is complicated and not yet fully understood. As human brain ages, characteristic structural changes occur that are considered normal and are expected. According to Schochet13 (1988) as ageing occurs the brain undergoes many gross and histopathologic changes with regression of the brain tissue leading to the enlargement of the ventricles. CT has provided revolutionary means for morphologic study of the brain in vivo. Majority of CT studies suggests that diencephalon volume is reduced and the volume of the third ventricle is enlarged with physiologic ageing.

Aims and Objectives
1. Aims of this morphometric study is to analyze the size of third ventricle and the dimension of diencephalon (thalamus) in humans.
2. To compare third ventricular size of males and females.
3. To correlate the changes in normal third ventricular size and corresponding changes in the dimension of diencephalon during ageing.

Materials and Methods
This was the prospective study of 12 month duration in which CT images of 112 adult individuals (Age Group 21-60) and 88 ageing individuals (Age above 61) of either sex attending department of Radiodiagnosis for brain CT was studied. The CT scanner used in the study was “SIEMENS SOMATOM VOLUME ZOOM MULTI SLICE (4 SLICE) MULTI DETECTOR SPIRAL CT SCANNER” with a scan time of 1-10 sec and slice thickness of 4mm. Measurement of third ventricle and diencephalon(thalamus) was made by using dicomworks software.
Analysis of Image
Measurement of third ventricle and diencephalon (thalamus)
- Greatest height in cms
- Greatest anterior-posterior extent in cms, for third ventricle the anterior-posterior extent was measured from column of fornix to pineal gland and for diencephalon from anterior pole of thalamus to pulvinar
- Greatest transverse diameter in cms, maximum transverse distance along the horizontal axis

Results
Table 1: Comparison of morphometry of third ventricle and diencephalon (thalamus) in males and females age 20-60 years

<table>
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<th>Samples</th>
<th>Female Aged 20-60 yrs</th>
<th>Male Aged 20-60 yrs</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>T1</td>
<td>1.50</td>
<td>2.50</td>
</tr>
<tr>
<td>T2</td>
<td>1.44</td>
<td>3.26</td>
</tr>
</tbody>
</table>
Table 2: Comparison of morphometry of third ventricle and diencephalon (thalamus) in males and females age above 60 years

<table>
<thead>
<tr>
<th>Samples</th>
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<th>Male Aged Above 60 yrs</th>
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<tbody>
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<tr>
<td>D3</td>
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</tbody>
</table>

Discussion:

THIRD VENTRICLE
Studies by Gawler et al in 1976, Brinkman et al in 1981 and Soininen et al in 1982 found that the maximum transverse diameter of the third ventricle was 0.46 cms, 0.59 cms and 0.92 cms respectively with higher values in males. In the present study all the three dimensions of third ventricle were studied. The mean greatest height of third ventricle in males was 2.008 cms (SD 0.26) which was found to be greater than in females 1.99 cms (SD 0.28) which was statistically not significant in males and statistically significant in females. The greatest height of third ventricle showed positive correlation with age in both. The mean greatest anterior-posterior diameter of third ventricle was larger in males 2.47 cms (SD 0.326) than in females 2.46 cms (SD 0.33) which was statistically not significant in both and showed positive correlation with age in both. The mean greatest transverse diameter of the third ventricle was more in males 0.77 cms (SD 0.21) than in females 0.67 cms (SD 0.25) which was statistically significant in both and showed positive correlation with age in both.

DIENCEPHALON (THALAMUS)
Schwartz M et al showed that in the elderly the volumes of the thalamus is reduced. In the present study the mean greatest height of diencephalon in males was 1.42 cms (SD 0.222) which was found to be greater in females 1.44 cms.
(SD 0.218) which was statistically significant and showed negative correlation with age in both.

The mean greatest anterior-posterior diameter of diencephalon was larger in males 3.04 cms (SD 0.22) than in females 2.96 cms (SD 0.21) which was statistically significant and showed negative correlation with age in both.

The mean greatest transverse diameter of diencephalon was more in males 1.42 cms (SD 0.12) than in females was 1.39 (SD 0.12) which was statistically significant in females and statistically not significant in males and showed negative correlation with age in both.

**Conclusion**

1) The dimensions of third ventricle increases with age in both males and females. The increase was more in individuals with age above 60 years than individuals with age 20-60 years and more in males than in females.

2) The dimensions of diencephalon decreases with age in both males and females. The decrease was more in individuals with age above 60 years than individuals with

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