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A Study of structural changes of brain in patient with chronic schizophrenia by using CT Scan imaging technique

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ABSTARCT-

Title-A Study of structural changes in brain in patient with chronic schizophrenia by using CT Scan imaging technique

INTRODUCTION- World health organization in 1947 7TH APRIL considers normal health is a complete physical , mental and social wellbeing**.** When a person is mentally ill there must be some internal changes in the brain due to some changes in external environment. So if we get any changes in behavior of the person then it implies that there must be some changes in brain tissues**.** Most commonly found are personality changes which are suspiciousness, adamancy. Most commonly found psychiatric disorders are schizophrenia ,mania ,bipolar disorder, depression.

AIMS AND OBJECTIVES

1. To estimate most prevalent gender effected by psychosis.
2. To estimate most prevalent period of onset .

MATERIALS AND METHODS-

CT Imaging of brain of chronic psychotic patients have been taken coming to Outpatient department of psychiatry of a private hospital having symptoms of psychosis fulfilling ICD-10.

Study design- retrospective study

Result & observations-

Among all males diagnosed with psychosis majority are showing temporal cortex atrophy followed by frontal cortex atrophy. Among all females majority are showing frontal and temporal cortex atrophy in equal proportion. Mostly males are having cerebellar atrophic changes. Mostly males are coming to outpatient department with symptoms and signs of psychosis mainly in late stage4rth -6th decade. Temporal cortex atrophy is followed by frontal cortex atrophy in 4rth -6th decade of life.Cerebellar atrophy is mostly found in mid and late stages of life. Ventricular enlargement are detected in early and late stages of life which is unilateral.

Conclusion- With the help of CT Scan imaging of brain in case of patients coming with history of psychosis we can come into a definite diagnosis of schizophrenia or mania and can differentiate it from neurosis

Key words- brain, schizophrenia, CT Scan, mania, life.

I. INTRODUCTION-

World health organization(WHO)in 1947 7TH APRIL considers normal health is a complete physical , mental and social wellbeing**[1].** Frontal cortex of human brain can be divided into orbitofrontal, mediofrontal and dorsolateral prefrontal cortex. Orbito frontal cortex is named 11,12,13,14 and this area is concerned with olfaction, gustatory and taste senasation. Dorsolateral prefrontal 6,8,9,10 cortex is associated with memory, attention , language, new learning activity, creativity. Right dorsolateral prefrontal cortex is concerned with positive symptoms and left dorsolateral prefrontal cortex with negative symptoms of psychosis. Medial prefrontal cortex is associated with bimanual coordination of movement, attention to demanding cognitive task, this area is also involved in pain perception and mediating emotional response behind this**.[2]** When a person is mentally ill there must be some internal changes in the brain due to some changes in external environment. So if we get any changes in behavior of the person then it implies that there must be some changes in brain tissues**.[3]** Most commonly found is personality changes which are suspiciousness, adamancy, impulsiveness and delusion. Most commonly found psychiatric disorders are schizophrenia ,mania ,bipolar disorder, depression**.[4]**Temporal gyri can be devided into superior,middle and inferior temporal gyri. Superior temporal gyrus is broadman area 22, middle temporal lobe 21,inferiror temporal lobe 20. Posterior part of superior temporal gyrus is named area 41 and 42 called auditory area. Anterior temporal pole is area38 also known as psychical

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cortex**.** Auditory hallucination(AVHs) is a positive symptom in schizophrenia. Here patient hears voices without any external stimulus. In AVHs patients structural imaging show a volume reduction in speech perception areas such as superior temporal gyrus(STG)and primary auditory cortex. There is white matter disruption in arcuate fasciculus and fibers of corpus callosum**.** Decreased perfusion in the frontal, temporal, and striate-thalamic region is characteristic of schizophrenia. These dysfunctional circuits may disturb input and output processing, leading to auditory hallucinations **[5]**There is volume reduction in the temporal lobe of schizophrenic patients. There is a localized volume reduction of the left temporal lobe and its correlated with thought disorder in schizophrenic patients.The schizophrenic patients show reduced gray matter volume in the left anterior hippocampus amygdala complex and the left superior temporal gyrus. The degree of thought disorder is related to lowering the magnitude of the left posterior superior temporal gyrus **[6]**

AIMS AND OBJECTIVES

1) To estimate most prevalent gender effected by psychosis.
2) To estimate most prevalent period of onset .
3) To find out most commonly effected sites of brain in psychosis of long duration more than 2 years.
4) To differentiate psychosis and neurosis by observing changes in brain ventricles in both psychotic and neurotic patients coming with similar symptoms.

II. MATERIALS AND METHODS

Photographs of CT Scans of brain have been taken with the help of a digital camera. History of those patients were taken by one independent psychiatrist with consent from patients for the CT Scansof brain.

Study design- retrospective study

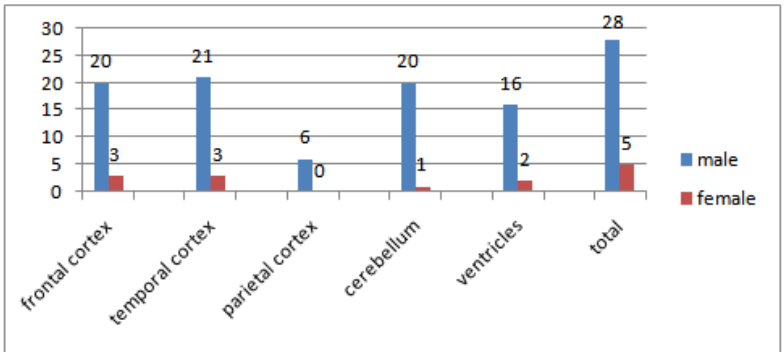
Exclusion criteria-

1. Patients having symptoms of cognitive impairment.
2. Patients with age group more than 60 years.
3.Patients with cerebrovascular accidents, cerebral infection, congenital malformations of brain.

III. RESULTS & OBSERVATIONS-

(A)Distribution of cases with respect to changes in different areas of brain-
(Table-1)

SEX	Frontal cortex	Temporal cortex	Parietal cortex	Cerebellum	Ventricles	Total
Male	20(71%)	21(75%)	6(21%)	20(71%)	16(57%)	28
Female	3(60%)	3(60%)	0(0%)	1(20%)	2(40%)	5



Graph-1

Among all males diagnosed with psychosis majority are showing temporal cortex atrophy followed by frontal cortex atrophy. Among all females majority are showing frontal and temporal cortex atrophy in equal proportion. Mostly males are having cerebellar atrophic changes.

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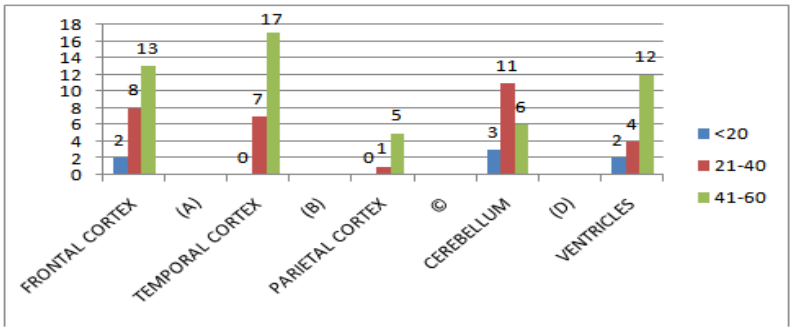
(B) **Agewise distribution of cases (TABLE-2)**

AGE (YEARS)	FRONTAL CORTEX	TEMPORAL CORTEX	PARIETAL CORTEX	CEREBELLUM	VENTRICLE	TOTAL
<20	2(40%)	0	0	3(60%)	2(40%)	5 M-5(100%) F-0
21-40	8(72.7%)	7(63.6%)	1(9.1%)	11(100%)	4(36.4%)	11 M-10(91%) F-1(9.1%)
41-60	13(76.5%)	17(100%)	5(29.4%)	6(35.3%)	12(70.6%)	17 M-13(76%) F-4(23.5%)



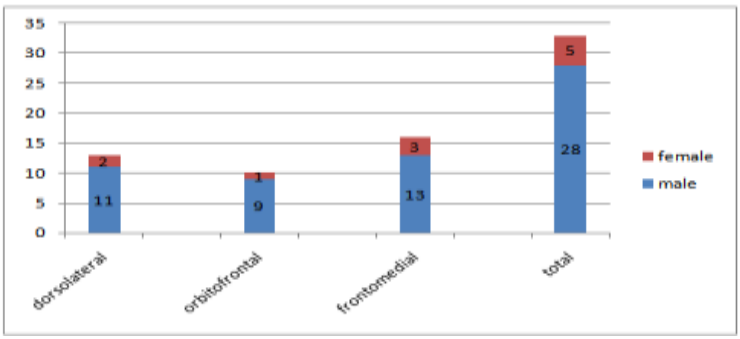
Graph-2

From the table-1 and its corresponding graph -1 it has been clear that mostly males are coming to outpatient department with symptoms and signs of psychosis mainly in late stage(4rth -6th decade).Temporal cortex atrophy is followed by frontal cortex atrophy in 4rth -6th decade of life.Cerebellar atrophy is mostly found in mid and late stages of life. Ventricular enlargement are detected in early and late stages of life which is unilateral.

(C) **Sexwisedistribution of parts in frontal cortex-**

(Table-3)

Sex	Dorsolateral	Orbitofrontal	Frontomedial	Total
Male	11(39%)	9(32%)	13(46%)	28
Female	2(40%)	1(20%)	3(60%)	5



Graph-3

From Table-3 and its corresponding graph it has been observed that frontomedial part undergoes atrophic changes followed by dorsolateral part of frontal cortex.

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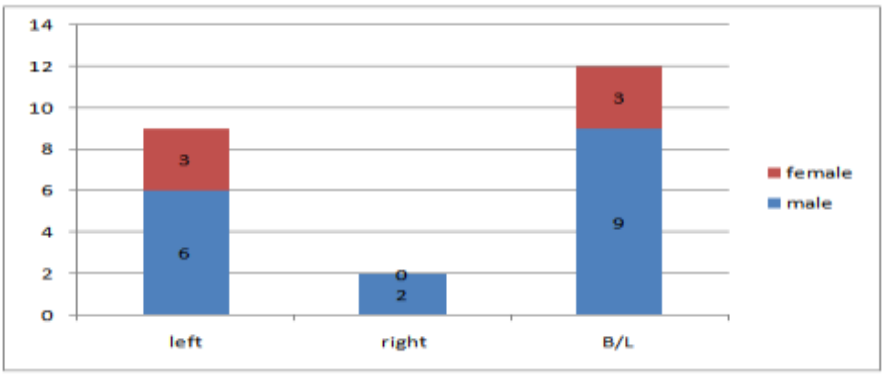
(D) **Sidewise distribution of cases with temporal cortex atrophy**

(Table-4)

Sex	Left	Right	B/L	Total
Male	6 (21%)	2 (7%)	9 (32%)	28
Female	3 (60%)	0 (0%)	3 (60%)	5



Graph-4

From Table-4 and its corresponding graph is has been observed that in both the sexes bilateral cortical atrophy is common mostly on the left side.

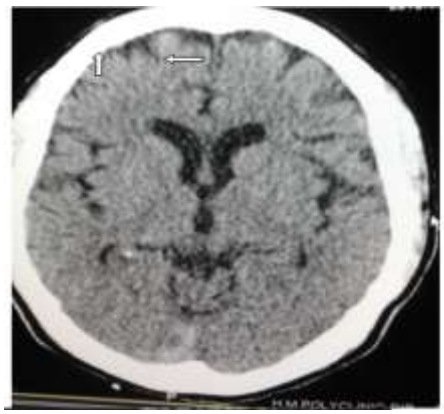
(E)Regarding unilateral ventricular enlrgement it is mostly observed on left side .Usually biventricular enlargement is found in neurotic patients.

CEREBELLAR ATROPHY

Figure-1

LEFT SYLVIAN FISSURE ATROPHY MORE THAN THE RIGHT FISSURE

Figure-2



DORSOLATERAL AND FRONTOMEDIAL PRECORTEX ATROPHY

Figure-3

LEFT VENTRICULAR ENLARGEMENT

Figure-4

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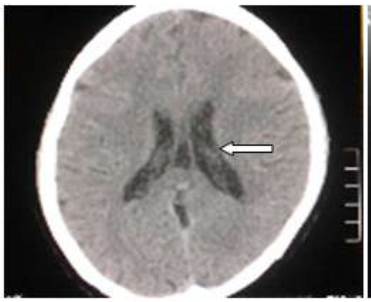
PARIETAL CORTEX ATROPHY

Figure-5

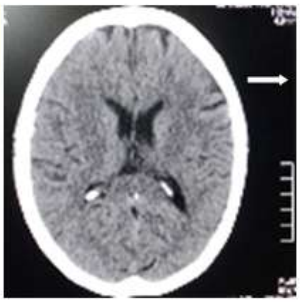
ATROPHY OF ANTERIOR POLE OF LEFTTEMPORAL LOBE

Figure-6



LEFT VENTRICULAR ENLARGEMENT

Figure-7



LEFT DORSOLATERAL PREFRONTAL CORTEX ATROPHY

Figure-8

IV. DISCUSSION-

AUTHORS	SESSION	STUDY	PRESENT (2016)STUDY
Gattaz W.F.,Kohlmeyer K,Gasser T	1990	Cerebral atrophy in schizophrenia,cerebellar atrophy in mania	Cerebral atrophy in schizophrenia and cerebellar atrophy in mania
Vita E,Sacchetti E,Calzerroni A,Cazullo CL.	1988	Male sex ,unilateral cerebral ventricular enlargement	Male sex,unilateral cerebral ventricular enlargement
MK Ashok ,M Charu,L Mark	2002	Asymmetrical sylvian fissures,frontal horn	Asymmetrical sylvian fissures,frontal horn.
SayoA,Jennings RG, Van Horn JD	2012	Early onset. ventricular enlargement.	Lateonset .ventricular enlargement in early and late onset.
K.Kasai,ME Shenton,DF Salusburry,	2003	Left temporal cortex	Left temporal cortex
Delisi E Lynn	2008	Left ventricular enlargement	Left ventricular enlargement

Wi hoon, jung, june sic kim.	2009	Medial prefrontal cortical atrophy is most common.	Medial prefrontal cortical atrophy is the most common.

V. CONCLUSION-

With the help of CT Scan imaging of brain in case of patients coming with history of psychosis we can come into a definite diagnosis of schizophrenia or mania and can differentiate it from neurosis.

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