



A Study on *Shiromarma* WSR to Radiological (CT) Changes in *DoshajaShiroMarmaAbhigata*: Observational study

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Abstract

Doshaja Shiromarmaghata is an emergency clinical condition in which vitiated *Doshas* accumulates in *mastulunga* or *mastiska* leading to pathological changes in *shiromarma* which results in manifestation of neurological disorders like *Ardita*, *manyastambha*, *shwasa*, *kasa*, *hanugraha*, and *murcha*. The radiological anatomy facilitates the diagnosis and management of brain disorder and added significantly to our understanding of pathophysiological brain alterations in case of humans. Signs and symptoms of *Shiro marmaabhigata* depend on the involvement of structures in the brain. The most commonly involved structures were frontal lobe, parietal lobe, MCA and basal ganglia.

Key words: *Marma*, *Mastiska*, *Shiras*, *Doshajamarmaabhigata*

INTRODUCTION

The legacy of Ayurveda is incomparable due to the vast knowledge and information hidden inside the treatises. The anatomical and surgical related information in relation to the clinical diagnosis and treatment is explained in detail. One can find description of anatomical parts of body in the three greatest treatises *Sushruthasamhita*, *Charakasamhita* and *Ashtangasangraha*. The part of the body which is superior among all the body parts and where the life and sensory organs are seated is called as *Shira* (head) (Jadavji Trikamji Acharya, 2001). The head is compared to root (*Moola*) and the other body extremities as branches (*Sakhas*). They said the diseases affecting the *Moola* (depth) of the body should be treated soon, since it suddenly afflicts and destroys the body as similarly the tree is destructed by the diseases pertaining to its root (Harishastri Paradakara, 1998) Shiras contains *mastulunga* or *mastiska* which acts as vital part in head region. *Mastulunga mastakaabyantarsneha*, means brain which is rich in lipids and proteins. A verse in the text “*Mastulungahardhavinagrutakaromastak amajja*” means *mastulunga* resembles partly melted ghee and it is also known as

mastakamajja (Jadavaji Trikamji Acharya, 2002).

Majja is predominance of *snehaguna*. According to *panchamahabuta siddhanta*, *mastulunga* is predominantly constitutes *jala* (water) and *prutwi* (earth). According to *asrayi asrayabhava siddhanta*, the material which causes increase of *ashraya* will also affect in the increase of *ashrayi* and vice versa. It means *ashraya* is directly proportional to *ashrayi* in pathophysiological aspects (Hari Shastri Paradakara, 1998). Junction of shirakapalasti leads to formation of cranial cavity. Inside the cranial cavity *majja* and *vaata* are present. Here *mastulunga* is brain and *vaata* can be considered for nerve impulse.

Doshaja Shiromarmaghata is a clinical condition in which vitiated *doshas* (humours) accumulates and injury to head leads to manifestation of neurological disorders like *ardita* (facial paralysis) *manyastambha*, *shwasa* (dyspnoea), *kasa* (cough), *hanugraha*, and *murcha* (vertigo) (Jadavji Trikamji Acharya, 2001).

The beginning of CT in early 1970s greatly facilitated the diagnosis and management of brain disorder and added significantly to our understanding of pathophysiological brain alterations in case of humans (David Sutton). With CT it is

now possible for diagnose and distinguish between *Margavarodha* (infarction) and *Raktasrava* (haemorrhage). In addition, other brain lesions, at times, may clinically

MATERIAL AND METHODS

Data related will be collected and compiled from *Brihatrayis*, *Laghutrayis* contemporary medical texts viz., Gray's Anatomy, Davidson's Medicine, Harrison's Principles of Internal Medicine and also research articles from internet.

A special case proforma is prepared with all points of *Shiromarmabhighata* and observations of 100 patients are selected for the study with an age 20 to 80 years.

present as stroke like syndromes such as primary or metastatic brain tumour or subdural hematoma that can usually be clearly differentiated by CT examination.

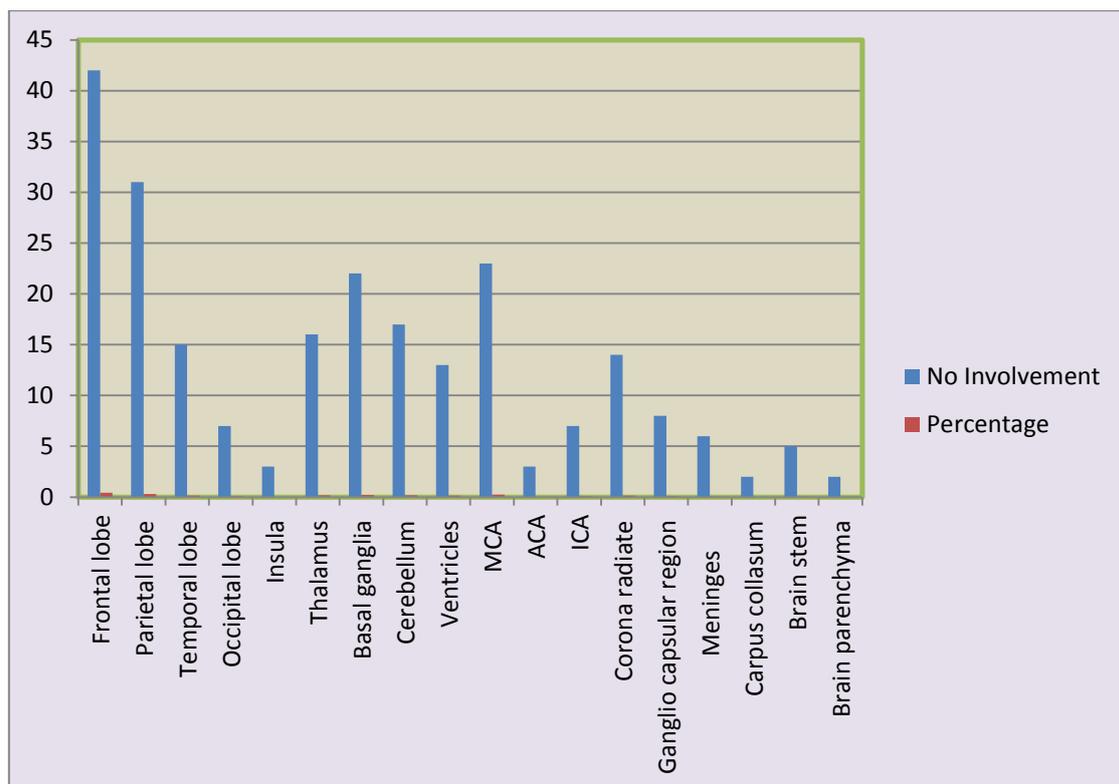
Diagnosed patients of *shiromarmabhighata* are clinically examined for signs and symptoms. Structural changes are observed in CT and correlated with anatomical features.

OBSERVATIONS

In the present study, 100 patients fulfilling the inclusion criteria of *DoshajaShiromarmabhighata* were studied along with radiological changes.

Table 1: Structural involvement wise distribution of patients

Structures of brain	No Involvement	Percentage
Frontal lobe	42	42%
Parietal lobe	31	31%
Temporal lobe	15	15 %
Occipital lobe	07	07 %
Insula	03	03 %
Thalamus	16	16 %
Basal ganglia	22	22 %
Cerebellum	17	17 %
Ventricles	13	13 %
MCA	23	23%
ACA	03	03 %
ICA	07	07%
Corona radiate	14	14%
Ganglio capsular region	08	08%
Meninges	06	06%
Carpus callosum	02	02%
Brain stem	05	05%
Brain parenchyma	02	02%



Graph 1: Structural involvement of brain due to DSMA

Among the 100 patients 42% have structural changes in frontal lobe, 31% in parietal lobe, 23% in MCA, 22% in basal ganglia, 17% in cerebellum, 16% in thalamus, 15% in temporal lobe, 14% in corona radiata, 13% in ventricles, 8% in gangliocapsular region, 7% in occipital, 7% in ICA, 6% in meninges, 5% in brain stem, 4% in brain parenchyma, 3% in ACA and 2% in corpus callosum were found in present study.

DISCUSSION

CT/MRI of 100 patients of DSMA (DoshajaShiroMarmaAbhigata) was observed for structural changes. The data available from the observations made in

this study of 100 patients are being discussed henceforth.

Structural involvement:

The above graph is showing rate of involvement of the brain structures in DSMA but not number of patients involved.

Among the 100 patients 42% have structural changes in frontal lobe. The frontal lobes include the areas of the motor cortex and the premotor cortex posteriorly, and the prefrontal cortex anteriorly. The motor and premotor cortices are involved in the planning and initiating of movements. Damage to medial areas of the premotor cortex (supplementary motor

area) can prevent the ability to initiate voluntary actions (abulia) that can be so severe as to prevent any movement (akinesia). In present study 42 patients have pathological changes in frontal lobe.

Among the 100 patients 31% have structural changes in parietal lobes because its main functions are perception and interpretation of cutaneous and kinaesthetic sensation and sensory feedback to motor area. Damage to the right hemisphere of this lobe results in the loss of imagery, visualization of spatial relationships and neglect of left-side space and left side of the body. Apraxia is a disorder of motor control which can be referred neither to “elemental” motor deficits nor to general cognitive impairment. Apraxia is predominantly a symptom of left brain damage, but some symptoms of apraxia can also occur after right brain damage.

Among the 100 patients 23% have structural changes in MCA (Mid Cerebral Artery) because it is major artery which supplies blood for the superolateral part of the cerebrum. If any pathological changes in this artery that leads to pathological changes in cerebrum and leads to contralateral paralysis in body depends upon involvement of the cerebral lobes. In present study among 100 patients 23

patients have pathological changes in MCA and Paralysis or weakness of the contralateral face and arm, Sensory loss of the contralateral face and arm and aphasia were found in above cases.

Among the 100 patients 22% have structural changes in basal ganglia because the basal ganglia are associated with a variety of functions including: control of voluntary motor movements, procedural learning, routine behaviours, eye movements, cognition and emotion movements are initiated by cerebral cortex and controlled by basal ganglia. Injury to basal ganglia leads to movement disorders. Among the 100 patients 17% have structural changes in cerebellum because it receives input from sensory systems of the spinal cord and from other parts of the brain, and integrates these inputs to fine tune motor activity. Cerebellar damage produces disorders in fine movement, equilibrium, posture, and motor learning. The most salient symptoms of cerebellar dysfunction are motor-related—the specific symptoms depend on which part of the cerebellum is involved and how it is disrupted.

Among the 100 patients 16% have structural changes in thalamus because these are situated between the cerebral cortex and the midbrain. Some of its

functions are the relaying of sensory and motor signals to the cerebral cortex, and the regulation of consciousness, sleep, and alertness. A cerebrovascular accident (stroke) can lead to the thalamic syndrome which involves a one-sided burning or aching sensation often accompanied by mood swings.

Among the 100 patients 15% have structural changes in temporal lobe because the temporal lobes are involved in processing sensory input into derived meanings for the appropriate retention of visual memories, language comprehension, and emotion association. Individuals who suffer from medial temporal lobe damage have a difficult time recalling visual stimuli. This neurotransmission deficit is due to lacking perception of visual stimuli and lacking perception of interpretation. The most common symptom of inferior temporal lobe damage is visual agnosia, which involves impairment in the identification of familiar objects. Temporal lobe epilepsy is a chronic neurological condition characterized by recurrent seizures; symptoms include a variety of sensory (visual, auditory, olfactory, and gustation) hallucinations, as well as an inability to process semantic and episodic memories.

Among the 100 patients 14% have structural changes in corona radiate because it is motor and sensory pathways to the body, injury leads to contralateral loss of motor and sensory activity in the body. Corona radiata is a white matter sheet that continues ventrally as the internal capsule and dorsally as the semioval center. This sheet of both ascending and descending axons carries most of the neural traffic from and to the cerebral cortex. The corona radiata is associated with the corticospinal tract, the corticopontine tract, and the corticobulbar tract.

Among 100 patients 13% patients have pathological changes in ventricles, that may lead to increased intracranial pressure or the particular centre may be involved in the pathology. For example involvement of floor of fourth ventricle may lead to respiratory or cardiac problems.

Among 100 patients 8% patients have structural changes in ganglio-capsular region that may lead to signs and symptoms of basal ganglia injury or internal capsule injury.

Among the 100 patients 7% have structural changes in occipital lobe because one occipital lobe is damaged, the result can be homonymous hemianopia vision loss from similarly positioned "field cuts"

in each eye. Occipital lesions can cause visual hallucinations. Lesions in the parietal-temporal-occipital association area are associated with colour agnosia, movement agnosia, and agraphia. Damage to the primary visual cortex, which is located on the surface of the posterior occipital lobe, can cause blindness due to the holes in the visual map on the surface of the visual cortex that resulted from the lesions. Recent studies have shown that specific neurological findings have had an impact on idiopathic occipital lobe epilepsies.

CONCLUSION

All the sense organs and the channels carrying the sensory and vital impulses from the head are like the rays from the sun. This verse truly signifies *Shira* (head) as one of the main *Trimarma* (three vital areas) which is a seat for brain. Thus, if there is any injury or blow to the head may lead to death or disastrous symptoms.

As in the introductory part explained about the body and the comparison of head as the root (*Moola*) and the extremities as branches (*Sakhas*), the diseases affecting the *Moola* (diseases origin from depth) should be treated soon, because it will suddenly affect and destroy the whole body, as the tree destructed by the diseases of its root. Head is the seat for *mastishkaor*

mastulunga (brain). Signs and symptoms of DSMA can be correlated with cerebral infarcts, hemorrhages infective and degenerative pathology of the brain.

Among all the signs and symptoms of DSMA *chestanasha* (immobility), *aksepaka*, *ardita* were found mainly.

The graph showed rate of involvement of the brain structures in DSMA but not number of patients involved. From the observation it can be inferred that Frontal lobe, parietal lobe, basal ganglia and MCA are main structures involved in *DhoshajaShiromarmabhighata*.

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