

STUDY OF ETIOPATHOGENESIS OF SHOTHA WITH SPECIAL REFERENCE TO SERUM ELECTROLYTE

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ABSTRACT

Hetu & Samprapti of *Shotha* has been described in all the *Samhita*, but in today's era the *Samprapti* of *Shotha* may vary according to *Hetu*. To the best of our knowledge direct references which establish clearly relationship between types of *Shotha* and according variation in Serum electrolyte values are not readily available. So in this research project, correlation of variation of electrolytes with types of *Shotha* has been done. A Clinical type of observational study has been done on 60 volunteers. Various *Hetu* and *Samprapti* of *Shotha* were studied in detail and Serum electrolyte has been carried out in each patient. Relationship between types of *Shotha* and Serum electrolyte has been seen. **Results-** Study has been carried out irrespective of age, sex, and socio economic status. Various *hetu* and its role in the manifestation of disease have been studied. Individual *Samprapti* has been mentioned according to the types of *shotha*. Also, the relationship between types of *shotha* and serum electrolyte has been observed. Consumption of *Katu*, *Lavan*, *Amla & Tikta Rasa* and *Viruddha ahara*, *Tridosha Prakopaka Ahar*, *Mamsaharsevan & Madya-pan* were the leading causes for *Shotha*. *Pitta pradhan Tridoshadushti*, *Rasa and Rakta Dhatu-dushti*, *Rasavaha*, *Udakavaha*, *Raktavaha Srotodushti* was predominantly seen. There were Sodium and Chloride depletion in *Pitta Vataj Shoth*.

Keywords: *Shotha*, *Pitta Vataj Shotha*, *Hetu*, *Samprapti*.

INTRODUCTION

There are many potential *Vyadhi* which creates substantial disturbance in healthy condition. *Shotha* is one of such *Vyadhi* which has a considerable importance regarding its prevalence and its ability to show severity of disease. Approximately 4.4 million people who are exposed annually. In National Health survey (India) extrapolated prevalence of *Shotha* is 6.25% *Shotha* is described in the *Samhita* as *Shotha*, *Shwayathu*, and *Shopha*. *Charakacharya* defines that which exhibits elevation on the surface of skin is called as *Shotha*¹.

Sushrutacharya defines the *Shotha* as a swelling which may appears at any one part of the body which is round, elevated, even or uneven in its surface. It restrict its locality between *twaka* and *mamsa*². Oedema is an abnormal and excessive accumulation of free fluid in the interstitial tissue spaces and serous cavities³. In Oedema imbalance in Serum electrolyte can occur. Serum electrolytes are electrically charged minerals that help to move nutrients into and wastes out of the body's cell. It maintains a healthy water balance and help to stabilize the body's acid

level. *Hetu & samprapti* of *Shotha* has been described in all the *samhita*. But in today's era the *samprapti* of *shotha* may varies according to *hetu*. So in proposed research project, to correlate variation of Serum electrolytes with types of *Shotha*. Hence the study is aimed to study the Etiopathogenesis of *Shotha* and to identify the relation of Serum Electrolytes with types of *Shotha*.

Materials & Methods: A Clinical type of observational study has been done on 60 volunteers. *Hetu* and *Samprapti* of *Shotha*

were studied in detail and Serum electrolyte has been carried out in each patient. Relationship between types of *Shotha* and Serum electrolyte has been observed. The observations of the study include the epidemiological and etiological factors of the disease. The observations and results are presented in the form of table and graphs.

Observations:

Table No.1-Division of volunteers according to *Hetu*, type of *Shotha*:

Type of <i>Shotha</i>	No. of Volunteers	Percentage
I) Nija Shotha	48	80%
1. <i>Vata-Kaphaj</i>	19	40%
2. <i>Vata-Pittaj</i>	7	15%
3. <i>Pitta-Kaphaj</i>	6	13%
4. <i>Kapha-Pittaj</i>	6	13%
5. <i>Pitta- Vataj</i>	6	13%
6. <i>Kapha-Vataj</i>	4	8%
II) Agantu Shotha	12	20%

Nija shotha was found in 80% of volunteers along with *Agantu Shotha* i.e. 20%. *Vata-Kaphaj* type of *Shotha* was found in 40% along With *VataPittaj* i.e.15%

Table No.2-Division of volunteers according to types of *Shotha*:

Type of <i>Shotha</i>	No. of Volunteers	Percentage
Swatantra	12	20%
Paratantra	48	80%
1. <i>Yakrutodar</i>	15	31%
2. <i>Prameha</i>	9	19%
3. <i>Vataj pandu</i>	8	18%
4. <i>Kaphaj pandu</i>	5	10%
5. <i>Pittaj Hridroga</i>	4	8%
6. <i>Vataj Hridroga</i>	3	6%
7. <i>Kaphaj-Hridroga</i>	2	4%
8. <i>Pittaj Pandu</i>	1	2%
9. <i>Agnidagdha</i>	1	2%

Paratantra type of *Shotha* was found in 80% followed by 20% *Swatantra Shotha*. 31% volunteers had *Shotha* as a *Lakshana* in

Yakrutodar as well as 19% volunteer of *Pramehavyadhi* had *Shotha*.

Table No.3-Division of volunteers according to Lakshana:

Lakshana	No. Of Volunteers	Percentage
<i>Pada Shotha</i>	53	88%
<i>Aruchi</i>	33	55%
<i>Daurbalya</i>	30	50%
<i>Jwara</i>	23	38%
<i>Shwaskrucchrata</i>	22	37%
<i>Trushna</i>	20	33%
<i>Mukhashotha</i>	17	28%
<i>Udarvidhi</i>	16	27%
<i>Alpamutrata</i>	15	25%
<i>Malavstambha</i>	11	18%
<i>Ayasenshwasa</i>	8	13%
<i>Hridashoola</i>	7	12%

Pada Shotha as *lakshana* was found in 88% volunteers & *Aruchi* & *Daurbalya* found in 55% & 50% volunteers resp. Table No.4-Division of volunteers according to *Aharaj Hetu* :

Aharaj Hetu	No. of Volunteers	Percentage
<i>Viruddhahar</i>	41	68%
<i>Rukshanna</i>	19	32%
Outside food	10	17%

As an *Aharaj Hetu* 68% volunteers had *Viruddhahar* & 32% *Rukshanna sevan*, which causes *Tridoshaprakopa*.

Table No.5-Division of volunteers according to *Vyasana* :

Vyasana	No. of Volunteers	Percentage
<i>Madyapan</i>	26	43%
Smoking	3	5%
Tobacco chewer	9	15%
Nil	22	37%

43% volunteers had *Madyapan* as a *Vyasana* along with 15% are Tobacco chewer.

Table No.6-Division of volunteers according to *Rasa as a Hetu* :

Rasa as a Hetu	No. of Volunteers	Percentage
<i>Madhura</i>	4	7%
<i>Amla</i>	14	23%
<i>Lavana</i>	17	28%
<i>Katu</i>	54	90%
<i>Tikta</i>	14	23%
<i>Kashaya</i>	2	3%

Volunteers were observed to have *Shotha*, along with 90% *Katu*, 28% *Lavana* & 23%

Amla & Tiktarasatmak Ahar as a major Hetu , above Rasa are Vata and Pitta Prakopaka.

Table No.7-Division of volunteers according to Viharaj Hetu :

Viharaj Hetu	No. of Volunteers	Percentage
Atishrama	20	33%
Atapasevan	3	5%
Divaswapa	3	5%
Driving	2	3%

33% Atishrama, 5% Atapasevan & Divaswapa as a major Viharaj Hetu were found, causing Tridosha Prakopa in Shotha.

Table No.8-Division of volunteers according to Doshadushti:

Samprapti Ghatak-Dosha	No. of Volunteers	Percentage
Pittapradhan Tridosha	31	52%
Vatapradhan Tridosha	18	30%

In 52% of volunteers had Pitta pradhan Tridosha & 30% Vatapradhan Tridosha was found.

Table No.9-Division of volunteers according to Dhatu & Srotodushti:

Samprapti Ghatak- Dhatu	Samprapti Ghatak-Srotas	No. of Volunteers	Percentage
Rasa	Rasavaha	60	100%
Rakta	Raktavaha	33	55%
Mamsa	Mamsavaha	9	15%
Meda	Medavaha	9	15%
Majja	Majjavaha	3	5%
	Pranavaha	28	47%
	Annavaha	24	40%
	Udakavaha	57	95%
	Mutravaha	18	30%
	Purishavaha	12	20%
	Swedavaha	12	20%

In 100% of volunteers Rasa Dhatu Dushti & rasavaha srotodushti that causes Srotorodha which leads to Vimargagaman along with 55% Rakta Dhatu Dushti & Raktavaha

srotasushti was found followed by 95% Udakavaha srotasushti.

Table No.10-Relation between Doshaj type of Shotha & Level of Serum electrolyte

Doshaj Type	Sodium			Potassium			Chloride		
	Normal	Decrease	Increase	Normal	Decrease	Increase	Normal	Decrease	Increase
Vata-pittaj	57%	43%	0%	43%	43%	14%	72%	14%	14%
Pitta-	100%	0%	0%	67%	33%	0%	67%	0%	33%

kaphaj									
Pitta-Vataj	0%	100%	0%	50%	33%	17%	33%	67%	0%
Kapha-Vataj	0%	75%	25%	75%	25%	0%	75%	0%	25%
Vata-kaphaj	68%	26%	6%	63%	21%	16%	79%	5%	16%
Kapha-Pittaj	67%	33%	0%	66%	17%	17%	67%	33%	0%
Agantu j	50%	50%	0%	84%	8%	8%	67%	25%	8%

Normal Sodium level was found in 100% of volunteers in *Pitta-Kaphaj Shotha*. Decreased Sodium level was found in 100% of Volunteers in *Pitta-Vataj Shotha*. Normal Potassium level was observed in most of volunteers. In *Pitta-Vataj Shotha* 67% Volunteers showed decreased Chloride level, while other type showed normal Chloride

level.

Statistical Analysis: **Data was analyzed using chi-square test where required. Multivariate analysis was used for demographic data.**

Table No.11-**Relation between type of Shotha and Serum Electrolyte At significance level of 0.05%**

No.	Type of Shotha	Calculated value (chi-square Test)	Tabulated values	Decision
1	<i>Vata-pittaj</i>	2.63	9.488	Ho Accepted
2	<i>Pitta-kaphaj</i>	8.64	9.488	Ho Accepted
3	<i>Pitta-Vataj</i>	6.32	9.488	Ho Accepted
4	<i>Kapha-Vataj</i>	7.5	9.488	Ho Accepted
5	<i>Vata-kaphaj</i>	4.06	9.488	Ho Accepted
6	<i>Kapha-Pittaj</i>	2.4	9.488	Ho Accepted
7	<i>Agantu</i>	5.8	9.488	Ho Accepted

DISCUSSION:

► **Type:** *Nija* type of *Shotha* was found in 80% of volunteers due to their *Dosha-prakopak Ahar* and *Vihar*, *Vata* reaches the external channels and affects *Kapha*, *Rakta*, *Pitta* as a result the passage gets obstructed which spread to nearby areas leading to development of *Shotha*, along with *Agantu* type which was 20% because of accident and trauma, compromised hygiene being an additional factor.

► *Paratantra* type of *Shotha* was found in 80% of volunteers as it was present as a *lakshana* in maximum no. of volunteers. In *Udara vyadhi*, *Pandu vyadhi*, *Hridroga*, *Shotha lakshana* was found as a *Upadrava* followed by 20% volunteers of *Swatantra Shotha* due to *Tridosha-prakopaka nidana sevana*, *Dosha* gets aggravated and bring abnormality in *Dhatu* leading to development of *Shotha*.

► **Lakshana:** *Pada Shotha* as a *lakshana* was found in 88% of volunteers as it is a dependent part of a body. Along with

this *Aruchi* was also found in 55% of volunteers due to *Agnimandya* & *Daurbalya* in 50% of volunteers.

- ▶ As a *Aharaj Hetu* 68% volunteers had *Viruddhahar* & 32% *Rukshanna* which causes *Tridosha Prakopa*, leads to *Shotha*.
- ▶ 31% volunteers had *Shotha* as a *Lakshana* in *Yakrutodara* as a result of further *dushti* of mainly *Agni*, *Rasadhatu* and *Udakavaha srotas* in *Yakrutodar* & 19% volunteer of *Prameha vyadhi* had *Shotha* because of *Agnimandya*, *Mutravaha* and *Udakavaha srotodushti*.
- ▶ **Vyasana:** Maximum number of patient's i.e. 43% was addicted to *Madyapana* followed by Tobacco chewer 15%. All these addictions provoke the *Vata* and *Pitta* to manifest the disease.
- ▶ Volunteers were observed to have *Shotha*, along with 90% *Katu*, 28% *Lavana* & 23% *Amla* & *Tikta rasatmaka Ahar* as a major *Hetu*. This *Rasa* may causes *Vata*, *Pitta prakopa* and the main vitiated *dosha* of this disease are *Vata* and *Pitta*.
- ▶ **Vihara** : 33% *Atishrama* & 5% *Atapasevan* & *Divaswapa* as a major *Viharaj Hetu* were found, causing *Tridosha Prakopa* in *Shotha*.
- ▶ **Dosha:** 52% of volunteers had *Pitta Pradhan Tridosha dushti* & 30% volunteers had *Vata Pradhan Tridosha dushti* was found.
Most of volunteers show *tridosha-prakopaka Ahara*, due to these etiological factors *Dosha* get aggravated and bring abnormalities in *Dhatu* leading to *Shotha*.
- ▶ **Dhatu:** *Rasa Dhatu* and *Rakta Dhatu* showed more vitiation in comparison to other *Dhatu*. 100% of volunteers

had *Rasa Dhatudushti* which was due to *Agnimandya* which indicates *Srotorodha Pradhan Samprapti*. & 55% of volunteers had *Rakta Dhatudushti* due to this Vitiated *Rakta* are located in *bahyasira*.

- ▶ **Srotas:** *Rasavaha srotas dushti* was found in 100% volunteers followed by *Udakavaha srotas dushti* in 95% & *Raktavaha* in 55% volunteers. Features of *Rasavaha srotodushti* such as *Ashradha*, *Aruchi*, *Asyavairasya*, *Arasadnyata*, *Hrulhasa*, *Gourava*, *Tandra*, *Angamarda*, *Jwara*, *Panduta*, *Agninasha*, *Srotorodha (Shotha)* were seen in all patients of *Shotha*. *Trishna*, *Jivha*, *talv*, *oshta*, *kantha*, *kloma shosha* were *lakshana* of *Udakavaha Srotodushti*, seen in majority of volunteers. It causes accumulation of *Pitta*, *Rakta* and *Kapha* between *Twaka* and *Mamsa*, which leads to *Shotha*.
- ▶ Normal Sodium level was observed in 100% of volunteers in *Pitta-Kaphaj Shotha*.
- ▶ Decreased Sodium level was found in 100% of Volunteers in *Pitta-Vataj Shotha*.
- ▶ Normal Potassium level was found in most of volunteers.
- ▶ In *Pitta-Vataj Shotha* 67% Volunteers showed decreased Chloride level, while other type showed normal Chloride level.
- ▶ **Statistical Analysis:** In Statistical Analysis using Chi-square test it shows the relation between type of *Shotha* and Serum electrolyte. At significance level of 0.05%, In *Vata-Pittaj Shotha*, *Pitta-Kaphaj Shotha*, *Kapha-Vataj Shotha*, *Vata-Kaphaj Shotha*, *Pitta-Vataj Shotha*, *Kapha-Pittaj Shotha* and *Agantu Shotha* calculated value of Chi-square test is less than tabulated value (9.488) of Chi-

square test. Hence Null Hypothesis is accepted. There were Sodium and Chloride depletion in *Pitta Vataj Shotha* but on the basis of Statistical test (Chi-Square Test) it is not significant.

CONCLUSION

- In *Nija Shotha*, *Vata-Kaphaj* type was predominant.
- In most of the volunteers *Shotha* was found as a *Paratantra Vyadhi*.
- In *Paratantra* types, *Shotha* as a *lakshana* was predominant in *Yakrutodar*.
- Consumption of *Katu, Lavan, Amla & Tikta Rasa, Tridosha Prakopaka Ahar, Mamsahar sevan, Madyapan and Viruddha ahara* were the leading causes of *Shotha*.
- *Padashotha* was predominant *lakshana*.
- *Pitta pradhan Tridosha dushti, Rasa and Rakta Dhatu Dushti, Rasavaha, Uda-kavaha, Raktavaha Srotodushti* were majorly seen.
- Sodium and Chloride depletion in *Pitta Vataj Shotha* but on the basis of Statistical test (Chi-Square Test) it is not significant.

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Source of support: Nil

Conflict of interest: None Declared