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Studies on *Vishada Guna* of *Vata Dosha* and validation of its assessment criteria

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ABSTRACT

Vata possesses the *Vishada* property which is assessed through its action of *Kleda Achusan* and *Ropan*. Action of *Vishada Guna* of *Vata Dosha* is *Kshalana Karma*. The causative factor for *Medavaha Srota Dushti* is *Avyam, Diva Swapno, Meda Bhakshan* and *Varuni Ati Seban*. Objectives of the study was to evaluate the etymological and syntactical derivation of the *Guna* of *Vata Dosha*, to evaluate the biophysical and molecular basis of the *Vishada Guna*. The study was conducted over 25 healthy volunteers (16 -70 years) who had the *Dhatu Samya Lakshanas* and 25 patients having the *Meda Kshaya Lakshans*. The healthy volunteers (Group-A) were taken under the control group for the assessment and standardization of the normal value of IL-1, IL-8 and TNF- α in the blood. Group-A with normal level of IL-1, IL-8 and TNF- α signify a specific range of objective parameters i.e. the activity of RE system with *Dhatu Samya Lakshanas* in healthy volunteers. Group-B the same objective parameters were recorded of the patients presenting with the *Sandhi Sphutan*, as a characteristic of *Meda Kshaya Lakshana*. Significant increase in the blood level of IL-1, IL-8 and TNF- α in comparison to healthy personality reveals that aggravation of *Vishada Guna* causes *Kshalana Karma* reflecting *Sandhi Sphutan*. Hence, those three parameters may be significant criteria for the assessment of *Sandhi Sphutan*.

Key words: *Vishada, Sandhi Sphutan, blood level of IL-1, IL-8 and TNF- α*

INTRODUCTION

All the diseases are produced due to some specific pathogenesis under which *Dosha-Dushya Sammurchana* plays the prime role.^[1] According to Ayurveda, in human body all the biological processes are controlled by *Vayu Pitta* and *Kapha*.^[2] Out of which *Vayu* plays the most important role.^[3] No diseases can be occurred without the vitiation of *Doshas*.^[4] The complex mechanism of the aggravated

Dosha and the diminished *Dhatus* leads to the production of different diseases.^[5] All the *Acharyas* have mentioned an opposite *Guna* for *Gurvadi Gunas*, like *Guru-Laghu, Manda-Tikshna, Hima-Ushna, Vishada-Picchila*^[6] and so on. These *Gunas* have their specific actions on cells, which is counteracted by the opposite *Gunas*, for cellular homeostasis. *Vata* possesses the *Vishada* property which is assessed through its action of *Kleda Achusan* and *Ropan*.^[7] *Vishada Guna* is explained as the property of scavenging and removal of necrotic debris, pus material and expose the wound surface to undergo healing measures.^[8] In the present era, maximum fatal diseases or life style related disorders are associated with *Medo Dushti*. Here *Medo Dushti* is implied for *Meda Kshaya*, which is characterized by *Sandhi Sphutan, Glanirakshno, Ayasa Along With Tanu Udar*.^[9] The causative factor for *Medavaha Srota Dushti* is *Avyam, Diva Swapno, Meda Bhakshan* and *Varuni Ati Seban*^[10] or precisely excessive intake of fatty substances, leading sedentary life and intake of alcohol like substances. As a result of *Medo Dushti, Ati*

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Sthaulya and *Prameha* are common disorders.^[11] In the physiological state the subjective parameters of *Vishada Guna* are *Sphutita Angabayaba*, *Shatata Sandhi Shabdagamini*.^[12]

Concept of Vishada Guna

According to *Ayurveda Tridosha* and constituent *Gunas* act together and spontaneously within the cellular limit to sustain the biological process. *Vishada Guna* is counted under *Doshas* of *Vata Guna*.^[13] Action of *Vishada Guna* of *Vata Dosha* is *Kshalana Karma*.^[14] The term *Kshalana* literally means “washing or wiping off” and may be interpreted by the cellular function of uptake of debris from the cell matrix in this context. Further *Kshalana* may be interpreted by the cellular function of uptake of debris from the cell matrix. *Vishada Guna* indicates the property of scavenging and removal of Necrotic debris, pus material and expose the wound surface to undergo healing measures.^[15] *Acharya Hemadri* illustrates an excellent concept regarding the action of the *Gunas* in fundamental cell organization.^[16]

AIMS AND OBJECTIVES

1. To evaluate the etymological and syntactical derivation of the Guna of *Vata Dosha*.
2. To evaluate the biophysical and molecular basis of the *Vishada Guna*.
3. To validate the assessment criteria of *Vishada Guna*.

MATERIAL AND METHODS

Criteria for selection of the patients

The study was conducted over 25 healthy volunteers (16-70 years) who had the *Dhatu Samya Lakshanas* and 25 patients having the *Meda Kshaya Lakshanas* (16-70 years) had been selected from OPD and IPD of IPGAE&R at SVSP hospital irrespective of their sex, occupation, religion etc.

Inclusion Criteria

The healthy volunteers (Group-A) were taken under the control group for the assessment and standardization of the normal value of IL-1, IL-8 and TNF- α in the blood. Group-A with normal level of IL-1,

IL-8 and TNF- α signify a specific range of objective parameters i.e., the activity of RE system with *Dhatu Samya Lakshanas* in healthy volunteers. In Group-B the same objective parameters were recorded of the patients presenting with the *Sandhi Sphutan*, as a characteristic of *Meda Kshaya Lakshana*. In group-B diagnosed patients of *Meda Kshaya Lakshana* (*Sandhi Sphutan* in specific) were taken for assessment of increased *Vishada Guna* of *Vata Dosha*. Aggravation of *Vishada Guna* of *Vata Dosha* in respect to *Sandhi Sphutan* is found in different diseases, but for the clinical purpose to assess the aggravated *Vishada Guna* of *Vata Dosha*, disease phenomena was not considered, whereas the *Meda Kshaya Lakshana* is not a significant disease phenomenon, but merely the sign and symptoms of *Meda Kshaya* (*Sandhi Sphutan* in specific) has been accounted. Therefore, under this study the selected patients presented with *Meda Kshaya Lakshana*, were not having significant pathological and biochemical altered state of blood in respect to blood sugar, lipid profile etc. *Sandhi Sphutan* is also found in *Meda Kshaya* and subsequently *Sandhi Sphutan* is the characteristics of *Vishada Guna*. As the main criteria were to assess the *Vishada Guna*, therefore the patient with *Meda Kshaya Lakshana* in terms of *Sandhi Sphutan* were included in this study.

Inclusion Criteria for Group - A

Apparently healthy volunteers of age group 16-70 years and having the sign and symptoms of *Dhatu Samya*.

Inclusion Criteria of Group - B

Patients were having *Meda Kshaya Lakshanas*, *Sandhi Sphutan Lakshan* in specific. Primarily detected *Meda Kshaya* patients were not taking any medicines. Patients satisfying the maximum subjective criteria for *Meda Kshaya*.

Exclusion Criteria

Volunteers those who are not willing to include themselves in the study and suffering from any other systemic diseases like hepatic failure, renal failure, cardiac disorder, diabetes mellitus, and malignancy and thyroid disorders.

Questionnaire

The questionnaire contains questions related with *Sandhi Sphutan* (i.e., crepitations in joints) and *Meda Kshaya Lakshana* were selected on the basis of *Guna, Karma* and *Lakshana* of *Vata Dosha* and *Lakshana* (i.e., sign and symptoms) of *Meda Dhatu Kshaya* (i.e., disorder related to decreased *Meda Dhatu*) described in Ayurvedic classics and modern texts.

History Proforma: It contains complete history and questions related with healthy volunteer and patient with *Meda Kshaya Lakshana*.

Grading Criteria: Following are the grading criteria were used to assess the subjective criteria of Group-A and Group-B.

Instruments

For the study, three instruments were used (ELISA kit for IL-1, ELISA kit for IL-8, ELISA kit for TNF- α) to assess the parameters. These parameters are indicators of activity of reticuloendothelial system in both healthy (with *Dhatu Samya Lakshana*) and *Sandhi Sphutan* condition (as patients with *Meda Kshaya Lakshana*). There is marked difference is seen in these parameters in both healthy and diseased condition. To compare this difference in both the condition, this study was conducted. This human TNF alpha ELISA kits uses pre-titrated, matched pairs of coating and detection antibodies to achieve sensitive and accurate measurement of tumor necrosis factor alpha (TNF- α) in samples at 50 to 100 μ L per well. Also included are calibrated recombinant protein standard, streptavidin-HRP, TMB substrate solution and stop solution.

OBSERVATION & RESULTS

In Group-A maximum number of healthy individuals were found in 26-30 years age group i.e., 72%. Whereas 24% of individuals belongs to 21-25 years and 4% were found in 46-50 years age group. In Group-B maximum number of patients were found in 26-30 years of age group i.e., 32%. Whereas 21-25-year age consists 12%, 31-35 years group consists 16%, 36-40 year consists 12%, 41-45 year group

consists 20%, 46-50 year consists 2% of all the patients. (Table 1)

In Group-A the maximum number of individuals were found in male subject i.e., 64% whereas 36% were found in female group. In group-B the maximum number of individuals was found in male subject i.e., 84% whereas 16% were found in female group. (Table 2)

Objective assessment of Interleukin -1 (IL-1 (pg/ml))

In group-A total range of blood IL-1 level found in between 21.4 – 189.4 and maximum percentage of person (i.e., 48%) were found in between the range of 77.5-133.4 pg/ml. (Table 3)

In group-B total range of blood IL-1 level found in between 96.5 – 373.1 and maximum percentage of person (i.e., 44%) were found in between the range of 188.8 - 280.9 pg/ml. (Table 4)

In group-A total range of blood IL-8 level found in between 45 – 144 and maximum percentage of person (i.e., 60%) were found in between the range of 78.1-112 pg/ml. (Table 5)

In group-B total range of blood IL-8 level found in between 111.5 – 300.4 and maximum percentage of person (i.e., 48%) were found in between the range of 174.5 – 237.4 pg/ml. (Table 6)

In group-A total range of blood TNF- α level found in between 55.2 – 133.2 and maximum percentage of person (i.e., 48%) were found in between the range of 55.2 – 81.2 pg/ml. (Table 7)

In group-B total range of blood TNF- α level found in between 156.2 – 312.5 and maximum percentage of person (i.e., 48%) were found in between the range of 156.2 – 208.3 pg/ml. (Table 8)

It was observed that the blood level of IL-1, IL-8 and TNF- α was more in Group-B in comparison with Group-A. (Table 9)

DISCUSSION

Maximum numbers of the healthy volunteers were from the age group of 26-30 years and 21-25 years respectively, due to selection of the healthy

volunteers were made from the PG scholars and staffs of this institute. Maximum numbers of the healthy volunteers were male as number of male PG scholars and staffs are more than that of female PG scholars. Maximum number of the *Meda Kshaya* patient were from the 26-30 years, who were presented with *Meda Kshaya Lakshana* but from 21-50 years of the patients *Meda Kshaya Lakshana* were presented who included themselves under the study as maximum number of the patients attending the OPD were from the low-income group. Therefore, their nutritional deficiency is one of the major factors and at the age group of 26-30 years all are engaged with excessive physical work with malnutrition. Therefore, *Meda Kshaya Lakshana* is very much significant in those age groups. Maximum numbers of the patients presented with *Meda Kshaya Lakshana* were male. The *Medavaha Sroto Dusti* is mainly caused by *Avyayam*, *Diva Swapna*, resulting in *Meda Kshaya*. The people of modern era are mostly habituated in sedentary life style because of which *Meda Dhatu* gets vitiated irrespective of male and female. Hence, it reveals that, sex wise distribution is not significant in this study, but may be due to the number of male patients are more than that of the female patients attending the OPD, the number of male patients is greater.

The study has its due importance to verify the hypothesis that, the validity of *Vishada Guna* in respect to IL-1, IL-8 and TNF- α . All the said parameters are altered with the impaired activation of reticulo endothelial system. The *Vishada Guna* of *Vata Dosha* signify the fundamental cellular activity of *Kshalana Karma*^[17] i.e. the act of scavenging mechanism or the mechanism of activation of Reticulo endothelial system. The *Vishada* quality of *Vata Dosha* was therefore required to justify in the tune of above hypothesis in the perspective of clinical study. Considering this above principle, the study had been carried out with a group of healthy volunteers having the criteria of *Dhatu Samya Lakshana* and observed the relative changes in the level of IL-1, IL-8 and TNF- α level in the blood and the another group with some patients having the *Meda Kshaya Lakshanas*^[18] and observed the relative changes in between the same

parameters mentioned above. *Vata* possesses the *Vishada* property which is assessed through its action of *Kleda Achusan* and *Ropan*.^[19] *Vishada Guna* is counted under *Vata Guna*^[20] and may reasoned by its act of *Kshalana Karma*.^[21] The term *Kshalana* may be interpreted by the cellular function of uptake of debris from the cell matrix. *Vishada Guna* indicates the property of scavenging and removal of Necrotic debris, pus material and expose the wound surface to undergo healing measures.^[22] *Sandhi Sphutan* is the physiological characteristics of *Vishada Guna* in relation to *Vata Prakriti*.^[23] Obese personalities are subjected to face *Sandhi Sphutan* due to overweight as there is accumulation of *Apakwa Meda* resulting the increased *Vishada Guna* in the synovial fluid.^[24] According to *Ayurvedic* concept, Due to the obstruction of the *Srota* by *Meda*, the movement of *Vata* is confined to *Kostha* resulting in the stimulation of the *Agni* and absorption of the food. So, the patient digests food quickly and becomes a voracious eater. If he does not get food when he needs it, he can be subjected to many diseases of serious nature. The *Agni* and the *Vata* are the two most troublesome factors; they burn the corpulent ones as the forest fire burns the forest. In the event of disproportionate increase of *Meda*, diseases of very serious types are caused, all of a sudden by *Vata*, etc. which may lead to instantaneous death. Owing to an excessive increase of *Meda* and *Mamsa Dhatu* the *Sphika*, *Uadara* and *Stana* becomes pendulous and his strength is rendered disproportionate with his physical growth.^[25] In all the above said diseases the *Vayu* gets aggravated resulting in the inflammation in different cells, but the target sites of the activities of *Vishada Guna* are related to the pathogenesis of the above said diseases. The cytokines are released due to over activation of *Vishada Guna*, releasing the IL-1, IL-8 and TNF- α ; therefore the series of changes take place. *Meda Kshaya* is the ultimate result of all the above said diseases and due to altered activities of *Vishada Guna* the *Sandhi Sphutana* is the ultimate outcome in different dimensions, which are characterized in the *Sandhivata*, *Asthi-Majja Gata Vata*, *Medo Gata Vata*, *Prameha* and *Sthaulya*. In *Sandhivata*, *Asthi-Majja*

Gata Vata, *Medo Gata Vata*, *Prameha* and *Sthaulya*, the *Vayu* gets aggravated, resulting in inflammation in different cells, but the target sites of the activities of *Vishada Guna* are related to the pathogenesis of the above said diseases. The cytokines are released due to over activation of *Vishada Guna*, releasing the IL-1, IL-8 and TNF- α ; therefore, the series of changes take place.

CONCLUSION

Meda Kshaya is the ultimate result of all the above said diseases and due to altered activities of *Vishada Guna* the *Sandhi Sphutana* is the ultimate outcome in different dimensions. Significant increase in the blood level of IL-1, IL-8 and TNF- α in comparison to healthy personality reveals that aggravation of *Vishada Guna* causes *Kshalana Karma* reflecting *Sandhi Sphutan*. In true sense, when blood level of IL-1, IL-8 and TNF- α are increased, definitely due to increased *Vishada Guna* of *Vata Dosha* within the body. Hence, those three parameters may be significant criteria for the assessment of *Sandhi Sphutan*. Therefore, the markers of *Vishada Guna* are assessed by IL-1, IL-8 and TNF- α .

Table 1: Age wise prevalence

Age group (in years)	Group-A No. of persons	Prevalence	Group-B No. of persons	Prevalence
16-20	00	0%	00	0%
21-25	06	24%	03	12%
26-30	18	72%	08	32%
31-35	00	0%	04	16%
36-40	00	0%	03	12%
41-45	00	0%	05	20%
46-50	01	4%	02	8%
Total	25	100%	25	100%

Table 2: Sex wise prevalence

Sex	Group-A No. of persons	Prevalence	Group-B No. of persons	Prevalence
Male	16	64%	21	84%
Female	09	36%	04	16%
Total	25	100%	25	100%

Table 3: Range wise prevalence of IL-1 (Group-A)

IL-1	Number of persons	Prevalence
21.4 – 77.4	11	44%
77.5 – 133.4	12	48%
133.5 – 189.4	02	8%

Table 4: Range wise prevalence of IL-1 (Group-B)

IL-1	Number of persons	Prevalence
96.5 – 188.7	07	28%
188.8 – 280.9	11	44%
281.0 – 373.1	07	28%

Table 5: Range wise prevalence of IL-8 (Group-A)

IL-8	Number of persons	Prevalence
45 – 78	09	36%
78.1 – 112	15	60%
112.1 – 144	01	4%

Table 6: Range wise prevalence of IL-8 (Group-B)

IL-8	Number of person	Prevalence
111.5 – 174.4	08	36%
174.5 – 237.4	12	60%
237.5 – 300.4	05	4%

Table 7: Range wise prevalence of TNF- α (Group-A)

TNF- α	Number of person	Prevalence
55.2 – 81.2	12	48%
81.3 – 107.2	11	44%
107.3 – 133.2	02	8%

Table 8: Range wise prevalence of TNF- α (Group-B)

TNF- α	Number of person	Prevalence
156.2 – 208.3	12	48%
208.4 – 260.3	02	8%
260.4 – 312.5	11	44%

Table 9: Comparative data and analysis of group-A and group-B of blood level of IL-1, IL-8, TNF- α .

Objective parameter	Mean \pm SEM Group A	Mean \pm SEM Group B	t value	p value
IL-1	87.932 \pm 7.971	232.732 \pm 15.275	8.577	<0.001
IL-8	82.748 \pm 5.227	193.864 \pm 9.163	10.751	<0.001
TNF- α	82.448 \pm 3.810	230.448 \pm 11.006	12.972	<0.001

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