



Etiopathological Study Of *Sthaulyagata Vikrita Kleda* With Special Reference To Laboratory Parameters

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ABSTRACT: Background: *Kleda* is a fundamental yet underexplored concept in Ayurvedic pathophysiology, representing the functional expression of *Jala Mahabhuta* responsible for tissue moisture, lubrication, and metabolic fluid balance. In its vitiated state (*Vikrita Kleda*), it plays a crucial role in the development of Kapha-dominant disorders, eg. *Sthaulya* and *Prameha*. Classical texts describe *Sthaulya* as a *Medo-pradoshaja* and *Santarpanajanya Vyadhi*, wherein deranged *Meda Dhatu* and impaired *Medodhatwagni* lead to excessive internal moisture and metabolic imbalance. However, *Kleda* has rarely been assessed as a measurable etiopathological entity using objective parameters. **Aim:** To evaluate *Sthaulyagata Vikrita Kleda* as an etiopathological factor and to explore its correlation with selected laboratory parameters. **Methods:** A clinical observational study was conducted on 100 subjects, comprising 20 patients each of *Prameha*, *Sthaulya*, *Sotha*, *Kushta*, and *Vrana*. Assessment was performed using a specially designed proforma based on classical Ayurvedic features of *Kapha Vriddhi* and *Ama*, supported by laboratory investigations including serum cholesterol and body mass index (BMI). A diagnosis of *Vikrita Kleda* was considered when four or more predefined features were present. **Results:** *Sthaulya* patients exhibited the highest prevalence of *Vikrita Kleda* features, particularly *Swedadhikya* (100%), *Kshuda Adhikya* (95%), and *Pipasa Adhikya* (90%). *Prameha* subjects showed overlapping *Kleda* manifestations, indicating a shared metabolic pathology. Elevated serum cholesterol was predominantly observed in *Sthaulya* and *Prameha*, while BMI analysis confirmed severe obesity in the majority of *Sthaulya* patients. Other disease groups demonstrated localized or minimal *Kleda* involvement. **Conclusion:** The study validates *Sthaulyagata Vikrita Kleda* as a central etiopathological factor in *Sthaulya* and allied metabolic disorders. The observed correlation between classical *Kleda* features and modern laboratory parameters highlights the

potential of integrative assessment in understanding disease pathogenesis and supports the clinical relevance of *Kleda* as a functional marker of metabolic derangement in Ayurveda

Keywords: Ayurveda, *Kleda*, *Sthaulya*, *Prameha*, *Vikrita Kleda*, Serum Cholesterol, BMI

INTRODUCTION:

The concept of *Kleda* occupies a central yet often understated position in Ayurvedic pathophysiology. Derived from the Sanskrit root “*Klid*” (to moisten or dampen), *Kleda* represents the functional expression of *Jala Mahabhuta* within the living body and is responsible for maintaining *Snigdhatta*, *Mardavata*, and *Picchilata* of tissues. In its physiological state (*Prakrita Kleda*), it supports tissue nourishment, lubrication, and normal *Srotasa* function, whereas in its pathological state (*Vikrita Kleda*), it becomes a significant contributor to disease manifestation¹. Classical Ayurvedic texts repeatedly highlight the role of deranged *Kleda* in the etiopathogenesis of disorders such as *Sthaulya*, *Prameha*, *Sotha*, *Kushta*, and *Vrana*, indicating its importance as a functional marker in disease *Samprapti*. *Sthaulya* is described as a *Medo-pradoshaja Vikara* and a *Santarpanajanya Vyadhi*, resulting from excessive nourishment, sedentary lifestyle, and impaired *Medo-dhatwagni*. The pathological accumulation of *Meda Dhatu*, along with *Kapha Prakopa* and *Agnimandya*, leads to increased internal moisture and fluid retention, thereby creating a state of *Sthaulyagata Vikrita Kleda*. Although *Sthaulya* is clinically evident as obesity, its deeper pathogenesis lies in the qualitative derangement of *Meda*, *Rasa*, and associated *Kleda*, which further predisposes the individual to metabolic disorders like *Prameha*². Thus, *Vikrita Kleda* acts as a connecting pathological link between *Sthaulya* and other *Kapha*-dominant systemic diseases. Despite its repeated mention in classical literature, *Kleda* has not been systematically assessed as a measurable etiopathological entity. Modern laboratory parameters such as serum cholesterol and body mass index (BMI) offer an objective window to understand the metabolic correlates of *Vikrita Kleda* in clinical settings. The present study is undertaken with this integrative vision to evaluate *Sthaulyagata Vikrita Kleda* as an etiopathological entity and to explore its association with laboratory parameters across different disease conditions.

AIM and Objectives:

a) AIM:

- To establish the concept of *Sthaulyagata Vikrita Kleda* and its role in the etiopathogenesis of different *Vyadhi*.

b) OBJECTIVE:

- To assess the *Sthaulyagata Vikrita Kleda* as an etiopathological entity in *Sthaulya*
- To explore the probable correlation of *Sthaulyagata Vikrita Kleda* with different laboratory parameters in *Sthaulya*

MATERIALS AND METHODS:

Study Design and Selection of Subjects: This clinical observational study was conducted at the Government. Ayurvedic College and Hospital, Jalukbari, Assam. Literary references were drawn from classical Ayurvedic texts, modern literature, recent journal articles, and credible online sources. A total of 100 patients (20 each of *Prameha*, *Sthoulya*, *Sotha*, *Kustha*, and *Vrana*) were selected randomly from the OPD and IPD. Both male and female patients, aged 18 to 70 years, exhibiting clinical features associated with *Sthaulayagata Vikrita Kleda*, and who provided informed consent, were included.

Clinical Assessment: A specially designed clinical proforma and validated questionnaire were used to assess both subjective and objective parameters of *Sthaulayagata Vikrita Kleda*. The questionnaire was developed from classical Ayurvedic descriptions and translated into patient-friendly language, featuring binary response options (Yes = 1, No = 0). Laboratory parameters were graded as usual (0), high (1), or low (2).

Diagnostic and Laboratory Investigations

Each patient underwent the Serum Cholesterol and BMI examination.

Vikrita Kleda Assessment Framework: Since classical texts lack direct descriptions of *Kleda* features, assessment was based on Ayurvedic concepts of *Kapha Vriddhi and Ama*. A level was considered positive for *Vikrita Kleda* if four or more out of seven identified features were present. The proportion of subjective vs. objective findings and the dominance of specific types of *Kleda* were calculated accordingly.

Kleda: *Kleda* denotes moisture or wetness in the body and is derived from the Sanskrit root *Klid*, meaning to moisten. In Ayurveda, it represents the functional expression of *Jala Mahabhuta* and the *Drava Guna*, responsible for maintaining softness, unctuousness, lubrication, and smooth flow within tissues. Functionally, *Kleda* supports fluid balance, *Dhatu Poshana*, *Srotasa* patency, and metabolic harmony, while also acting as a carrier of nutrients. Though not a distinct *Dhatu* or *Mala*, it is a vital functional entity associated mainly with *Meda Dhatu*, carried by *Rasa*, and eliminated through *Mootra* and *Sweda*. In its normal (*Prakrita*) state, *Kleda* sustains tissue integrity and physiological secretions, but in its vitiated (*Vikrita*) form—often due to *Agnimandya*, *Ama*, or *Kapha Prakopa*—it accumulates and contributes to the pathogenesis of disorders such as *Prameha*, *Sthoulya*, *Sotha*, *Kushta*, and *Vrana*. Thus, *Kleda* serves as an important functional and diagnostic marker in understanding disease *Samprapti* in Ayurveda^{1,2,3}.

Sthoulya: *Sthoulya* is *Medo Pradoshaja Vikara*, where we can observe excess abnormal *Medo Dhatu* in the individual⁴. As per Madhavakara, *Sthoulya* is also known as *Medoroga* (a condition where *Medo Dhatu* is excessively and abnormally increased)⁵. As per *Charaka*, it is categorised under *Santarpanjanya Vikara* i.e. disease caused by over nutrition of the body⁶. This is particularly common among persons who lead sedentary lifestyles. In other words, to say, when an individual is having more input or intake than output or work, then the person will have excess deposition of *Medas* (fat) in various portion of the body. When one analysis the *Dosha* vitiation, this is manifested as increase of *Kaphadosha* inside the body. *Sthoulya* is

categorised in *Sharirika* (somatic disease) category of *Vikara* under the subheading of *Doshabala Pravritta Vikara* which is categorised under *Adhyatmika Vikara*. This is having *Udbhava Sthana* as *Amashaya*, *Sanchara Sthana* as *Sarva Sharira* (whole body) and *Vyakta Sthana* as *Twak* (skin), *Sphik* (buttocks), *Udara* (abdomen) and *Stana* (breasts) ⁷.

Kleda as a Dushya in Sthaulya Samprapti: *Sthaulya* refers to “*Sthulya Bhava*” being bulkiness” i.e. abnormal increase in *Medadhatu* and *Mamsadhatu*. In the *Samprapti* of *Sthaulya*, *Meda Dhatu Vikriti* takes place. *Kledaka Kapha*, *Pachaka Pitta* and *Vyana Vayu* are the factors that cause the *Samprapti* of *Sthaulya*. *Sthaulya* results as the dysfunction of *Medadhatwagni* ⁸. Due to the *Nidana Sevana*, formation and movement of excess *Madhura Snigdha*, *Ama Anna Rasa* takes place, which leads to increased *Sneha Amsha* in *Dhatus*. The formed *Anna Rasa* which are travelling by the *Srotas* gets *Srotorodha* in leading to *Kha-vaigunya* due to *Sharira Shaitilya* and *Bija Svabhava* and combines with the *Meda Vikrita Vyanavayu* propels this augmented *Meda Dhatu* to its seat viz. *Udara*, *Sphika*, *Stana*, *Gala* etc. resulting in *Sthaulya* ⁹. The references of *Kleda* in *Sthaulya* is mentioned in Table 1.

Obesity: Obesity is described as an abnormal accumulation of body fat (*adipose tissue*) to an extent that it poses a risk to overall health. When an individual’s body weight exceeds the ideal weight for their age, sex, and height by more than 20%, it is regarded as a significant health concern¹⁰.

Table 1: References of Kleda in Sthaulya

STHOULYA			
Charaka Samhita	Sushruta Samhita	Astang Hridaya	Madhava Nidana
<i>Charaka Samhita Sutra Sthana - 21 Astha Ninditiya Adhaya</i>	<i>Sushruta Samhita Chikitsa Sthana- 11 Prameha Chikitsa</i>	<i>Astanga Hridaya Chikitsa Sthana -12 Prameha Chikitsa</i>	<i>Madhava Nidana- 34 Medoroga Nidanam</i>
<i>Charaka Samhita Sutra Sthana-16 Chikitsa Pravritiya Adhaya</i>	<i>Sushruta Chikitsa Sthana- 12 Prameha Pidika Chikitsitam</i>		

RESULTS AND OBSERVATION: In this study, total 100 pre-diagnosed subjects with 20 subjects each of *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana* were taken for the study.

Table 2: Incidence of *Sthauliyagata Vikrita Kleda*

<i>Sthauliyagata Vikrita Kleda</i>	<i>Prameha</i>		<i>Sthoulya</i>		<i>Sotha</i>		<i>Kustha</i>		<i>Vrana</i>	
	(n=20)		(n=20)		(n=20)		(n=20)		(n=20)	
	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%
<i>Chala Sphik – Udara – Stana</i>	3	15	15	75	1	5	2	10	0	0
<i>Kriccha Vyavata</i>	4	20	3	15	0	0	2	10	1	5
<i>Angagandha</i>	3	15	16	80	0	0	8	40	0	0
<i>Swadadhikya</i>	13	65	20	100	1	5	14	70	1	5
<i>Kshuda-Adhikya</i>	14	70	19	95	3	15	4	20	0	0
<i>Pipasa-Adhikya</i>	14	70	18	90	3	15	3	15	0	0
<i>Kshudra Swasa</i>	7	35	7	35	0	0	1	5	2	10

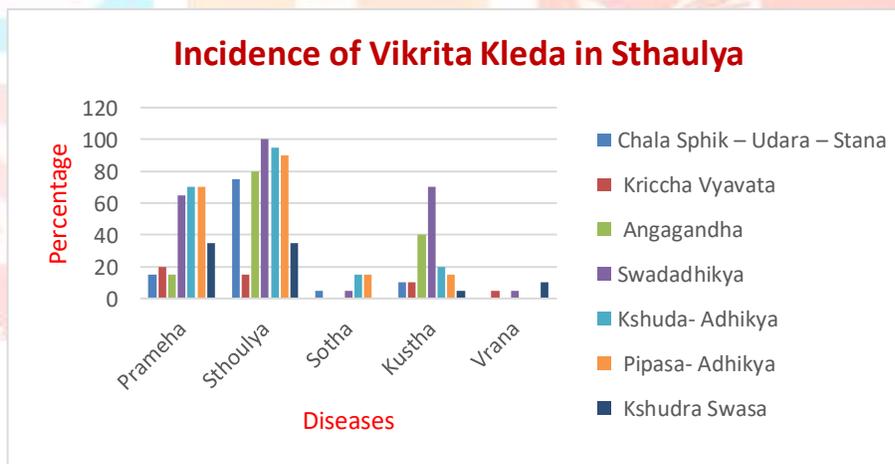


Fig. 1: Incidence of *Vikrita Kleda* in *Sthaulya* in 20 subjects of *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana* (n=100)

The study reveals that *Sthoulya* subjects shows the highest prevalence of all the *Vikrita Kleda* symptoms comprising *swedadhikya* (100%), *Kshuda adhikya* (95%), *Pipasa Adhikya* (90%). Subjects have also shown moderate occurrence of *Prameha* symptoms with most prevalence of *Kshuda* and *Pipasa* (70% each), minimal representation of *Sotha* symptoms, *Angagandha* (40%) is notable among the *Kustha* symptoms with others are marginal (less than 20%) and *Vrana* symptoms were very low incidence across all parameters.

Table 3: Incidence of Serum cholesterol in *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana*

Serum Cholesterol	<i>Prameha</i>		<i>Sthoulya</i>		<i>Sotha</i>		<i>Kustha</i>		<i>Vrana</i>	
	(n=20)		(n=20)		(n=20)		(n=20)		(n=20)	
	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%
Within Normal Limit	17	85	6	30	20	100	18	90	20	100
High	3	15	14	70	0	0	2	10	0	0
Low	0	0	0	0	0	0	0	0	0	0

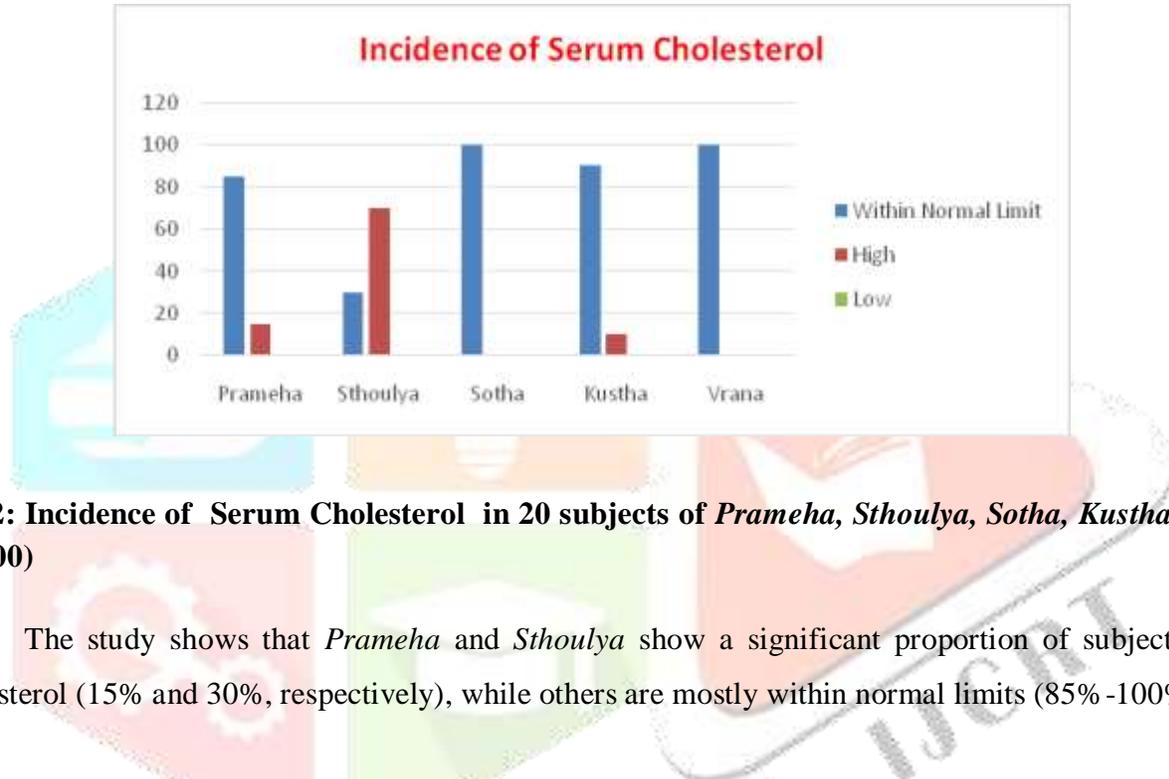


Fig. 2: Incidence of Serum Cholesterol in 20 subjects of *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana* (n=100)

The study shows that *Prameha* and *Sthoulya* show a significant proportion of subjects with high cholesterol (15% and 30%, respectively), while others are mostly within normal limits (85%-100%).

Table 4: Incidence of Body Mass Index in *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana*

BMI	<i>Prameha</i>		<i>Sthoulya</i>		<i>Sotha</i>		<i>Kustha</i>		<i>Vrana</i>	
	(n=20)		(n=20)		(n=20)		(n=20)		(n=20)	
	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%	No of Patient	%
BMI Less than 18.5	0	0	0	0	6	30	6	30	7	35
BMI 18.5 to less than 25	7	35	0	0	14	70	9	45	10	50
BMI 25 to less than 30	13	65	3	15	0	0	3	15	3	15
BMI 30 to less than 35	0	0	5	25	0	0	1	5	0	0
BMI 35 to less than 40	0	0	5	25	0	0	1	5	0	0
BMI 40 or greater	0	0	7	35	0	0	0	0	0	0

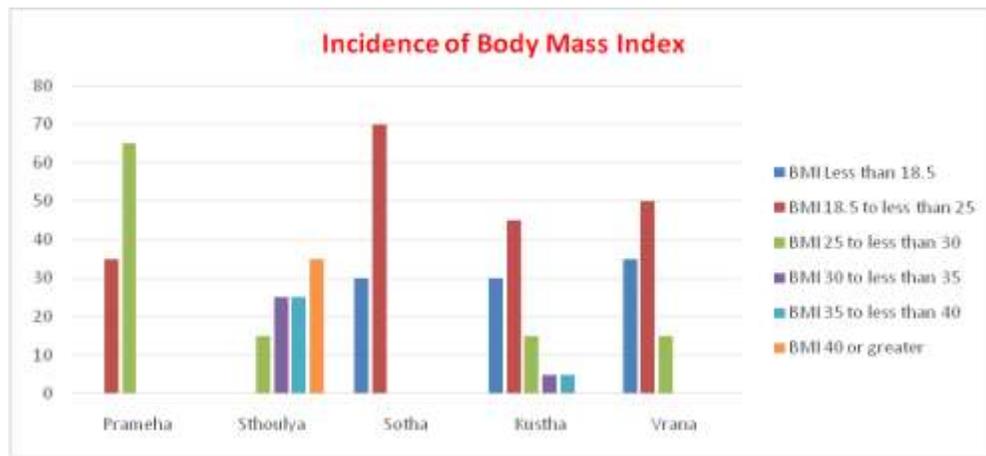


Fig. 3: Incidence of BMI in 20 subjects of *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana* (n=100)

The study shows that In *Prameha*, most subjects (65%) have a BMI of 25 to less than 30, with 35% between 18.5 and 25. No subjects fall below 18.5 or above 30. In *Sthoulya*, The majority (35%) have a BMI of 40 or greater, with 25% between 35 and 40, and 20% between 30 and 35, confirming a high prevalence of obesity. Only 15% fall between 25 and 30, with no cases below 25. In *Sotha* a significant 70% lies at 18.5 to less than 25, with 30% below 18.5. In *Kustha* the BMI distribution is more varied, with 45% between 18.5 and 25, 30% below 18.5, 15% between 25 and 30, and 5% each in 30-35 and 35-40 ranges, indicating no dominant BMI category. In *Vrana*, similar to *Kustha*, the distribution is spread, with 50% between 18.5 and 25, 35% below 18.5, and 15% between 25 and 30, suggesting a mix of normal and underweight individuals.

DISCUSSION:

Assessment of *Vikrita Kleda* in *Sthoulya*: After analysis of the statistical data, we can confirm the classical Ayurvedic understanding of *Sthoulya* as a *Medo-dushti* and *Kleda-pradhana Vyadhi*, with symptoms arising due to increased *Rasa* and *Meda Dhatu*, leading to *Shaithilya*, *Snigdhatta* and accumulation of fluid or *Kleda* in the body. The results with *Prameha* subjects suggest shared pathology with *Sthoulya* subjects, emphasizing the interlinking nature of *Prameha* and *Medo-dushti*, where excess *Kleda* manifests in similar ways. The *Sotha* subjects' results indicates that *Kleda* features of *Sthoulyagata Kleda* may be present, but is localized or less expressed systemically in *Sotha* subjects. Results of *Kustha* subjects reflect that in *Kleda*-dominant skin disorders, malodour due to exudates is the most striking symptom. *Vrana* subjects' results suggests limited *Kleda* features of *Sthoulyagata Kleda* involvement in wound pathophysiology unless chronic or infected. This validates that *Vikrita Meda* and *Ama-Kleda* are central to the pathogenesis of *Sthoulya*. *Prameha* subjects also shares overlapping features, emphasizing a common *Kleda*-oriented pathology. On the other hand, subjects of *Sotha*, *Kustha*, and *Vrana* exhibit more selective or localized *Kleda* symptoms.

Assessment of Serum Cholesterol in *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana*: *Prameha* and *Sthoulya* show a significant proportion of subjects with high cholesterol (15% and 30%, respectively), while others are mostly within normal limits (85%-100%). The elevated cholesterol in *Prameha* and *Sthoulya* highlights a metabolic link.

Assessment of BMI in Urine in *Prameha*, *Sthoulya*, *Sotha*, *Kustha* and *Vrana*: In *Prameha*, most subjects were overweight but not obese, while *Sthoulya* has shown dominance of severe obesity. *Sotha* presents a predominantly normal BMI with a notable underweight group, likely linked to fluid retention or malnutrition. *Kustha* and *Vrana* display mixed BMI distributions, with normal and underweight individuals forming the majority.

CONCLUSION: The present study establishes *Sthauliyagata Vikrita Kleda* as a key etiopathological determinant in *Sthoulya* and related metabolic disorders. Among the clinical features, *Chala Sphik-Udara-Stana* was most prominent in *Sthoulya* patients (75%), reflecting *Meda* predominance and structural looseness, while *Krichha Vyavata* was more evident in *Prameha* (20%), indicating shared but varied expressions of *Kleda* pathology. Features such as *Angagandha* (80%), *Swedadhikya* (100%), *Kshuda Adhikya* (95%), and *Pipasa Adhikya* (90%) were maximally expressed in *Sthoulya*, confirming excessive internal moisture and metabolic imbalance due to impaired *Medodhatwagni* and *Kapha Prakopa*. *Kshudra Swasa* (35%) was equally observed in both *Sthoulya* and *Prameha*, further supporting their common *Kleda*-centric pathogenesis. The strong association of these classical features with elevated BMI and serum cholesterol highlights the metabolic correlate of *Vikrita Kleda* and validates its role as a functional marker of disease.

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