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To Assess Prakriti in Sandhigata Vata with Special Reference to Preventive Concept- A Statistical Review:

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Abstract: One of the most crucial ideas is *prakriti,* which is chosen at the moment of conception. The *doshika* constitution is established based on the *dosha* that was prevailing at the time of the union of *sukra* and *sonita.* It is an expression of bodily functions, manifested in an individual's morphology, physiology, and behavior. The phenotypic and genotypic constitutions are indicated by *Prakriti. Prakriti* comes in seven varieties: *Vataj, Pittaj*, *Kaphaj*, three for each *dosha*, three for the combination of two *doshas* (*Dwandwaj*), and one for all three *doshas* together (Samadoshaj). Because of the dosha's homeostatic state, samadoshaj is regarded as the best of these. Each *prakriti* has unique physical and mental traits that are entirely dependent on the *dosha's* involvement. Ayurveda includes all arthritic conditions in connection with *asthi dhatu pradoshaj vikaraj.* Since *sandhigat vata* osteoarthritis is by far the most prevalent type of arthritis, we can correlate it with ayurveda.It is a leading source of pain and disability in the elderly and is closely linked to aging. Pathologically, it can be described as a disorder of the synovial joints when inflammation is not a significant clinical feature and there is focal loss of articular hyaline cartilage with proliferation of new bone and remodeling of the joint shape.

Objective: To diagnose osteoarthritis based on the WOMAC score and *sandhigata vata* based on the diagnosis as stated in many classical texts. A validated *Prakriti* Performa will be used to evaluate *Prakriti* and to ascertain how *Prakriti* and osteoarthritis are related.

Materials and Methods: Regardless of gender or socioeconomic status, the subjects in CBPACS OPD and IPD will be chosen at random. Patients with osteoarthritis who have been diagnosed will be chosen from the CBPACS Hospital's OPD and IPD. The recruited subjects will get written consent and an information sheet explaining the study, and their participation will be requested. Following the patients' written assent, we will use the Performa, which is based on symptoms listed in several *samhitas,* to grade the presence of osteoarthritis and determine its severity. The WOMAC score will be used to determine the severity of the condition.

Results: Study shows satisfactory positive assessment between *prakriti* and *sandhigata vata*, i.e. osteoarthritis by using WOMAC SCALE and *prakriti* assessment proforma.

Keywords: Ayurveda, *prakriti, sandhigata vata, vata dosha, vyayama, kha- vaigunya, strotorodha.*

INTRODUCTION:

What is *prakriti* and sandhigata vata? Is there any association between them?

Prakriti, which means "knowledge" in Sanskrit, was the first to introduce personalized and preventive care. Ayurveda provides a customized approach to maintaining health and treating *vyadhi*. The three primary *doshas* are *Pitta, Kapha*, and *Vata.* There are three basic *prakriti* categories, each called after a dominant *dosha* that is based on the relative importance of the other *doshas*. The *vata* are these. *Kapha* and *Pitta*. There are others who believe that the mother's lifestyle, food, and womb conditions determine the *prakriti* at conception. *Dosha* Their physical, psychological, and physiological qualities all exhibit similar traits. More rapidly than ever before, the field of global health is developing and changing. "Personalized medicine" is a branch of medicine that is founded on the unique genetic and environmental data of *prakriti.*

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Every arthritic condition is related to *asthi dhatu pradoshaj vikaraj* in *Ayurveda*. According to Ayurveda, osteoarthritis is associated with *sandhigata vata*. Osteoarthritis is by far the most common kind of arthritis. It is strongly associated with aging and is one of the main causes of discomfort and disability in the elderly. Pathologically, it is a synovial joint disease characterized by the production of new bone and localized loss of articular hyaline cartilage. The condition known as osteoarthritis (OA) mostly affects some minor and large joints. It is better understood as the dynamic process of synovial joint healing, which can be initiated by a variety of assaults, not all of which result in clinical joint failure. It is not a singular disease.

There are two types of osteoarthritis: primary and secondary. Despite sharing similar symptoms, these two forms of OA have different Etiologies. Both primary and secondary OA cause cartilage breakdown in joints, which results in bones rubbing against one another. In India, osteoarthritis affects 22% to 39% of people. The most prevalent joint disease and the second most prevalent rheumatologic problem.

SOME KEY POINTS WHICH SHOW RELATIONSHIP BETWEEN VATA DOSHA AND SANDHIGATA VATA:

We can regard the common *Nidana* for *Vata Vyadhi*, *Asthi* and *Majjavaha Srotodusti Karana* as the *Nidana* for *Sandhigata Vata*. since the *Acharyas* have not explicitly specified *Janu-Sandhigata Vata*. *Sandhigata Vata* is considered to be a part of *Vata vyadhi*. Because *Vyana Vayu* controls all body functions, including *Gati, Aksheepana, Utksepana, Nimesa*, and *Unmesa*, the activities of *Sandhi* and *Vata* are particularly comparable. Given the close relationship between these processes and joints, joint functions may also be impacted by a disrupted *Vyana Vayu. Hetu Sevana* vitiates *Vata*, which builds up in *Rikta Srotas* and causes a range of localized and widespread ailments, according to *Acharya Charaka*. According to commentator *Chakrapani, Samprapti* of *Sandhigata Vata* employs one of two approaches in connection with the *Nidana* of *Vata Prakopa*. The *Samprapti* of *Vata Vyadhi*, according to *Acharya Vagbhata*, is that *Dhatukshaya* vitiates *Vata,* which travels throughout the body and becomes trapped in the *Rikta Srotas*. This further vitiates the *Rikta Srotas*, which leads to the expression of *Vata Vyadhi*. They are *Avarana Janya* and *Dhatukshya Janya*. To learn about *sandhigata vata samprapti.*

OBJECTIVES:

According to numerous classical literature, osteoarthritis can be diagnosed using the WOMAC score, and *sandhigata vata* can be determined using the diagnosis.

To assess *Prakriti* and determine the relationship between *Prakriti* and osteoarthritis, a validated *Prakriti* Performa will be employed.

CONCLUSION:

If a study produced no results, it would not have achieved its objectives. Without a doubt, any empirical or theoretical investigation grounded in shastras would produce some enlightening results. Some conclusions can also be reached from this study thanks to a thorough discussion, data collection, and observations. The results of the study showed that *Prakriti* and *sandhigata vata* were correlated. The H_1 hypothesis of the investigation is accepted. We draw the conclusion that the WOMAC score, disease severity, and *sandhigata vata* and *prakriti* are statistically correlated. This implies that patients with *vata-kaphaja prakriti* are more likely to have *sandhigata vata*. The body deteriorates in middle and later age because to *sandhigata vata.*

MATERIAL AND METHODS USED:

Individuals who can independently provide their medical history and information for evaluation were selected for study. Individuals which were of age group 40-60 years were selected irrespective of race, religion and socioeconomical status with the help of non randomized convenient method. 100 subjects were selected for the study by using inclusion and exclusion criteria. The study was open to anyone who was willing to take part and willingly filled out the necessary information on the English language proformas. The generated data was collated into an excel sheet.

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ETHICAL CONSIDERATION AND INFORMED CONSENT:

The participants must voluntarily consent to participate in the study before they can fill out the proformas. Participation in the study was restricted to individuals who gave their consent. The user received assurances that their confidentiality and anonymity would be protected and that the material they submitted would only be utilized for study. The users were also told that they were contributing significantly to the nation's literature and public health studies by opting to fill out the Google form. The participants' voluntary consent to the use of their data for research purposes was made known at the outset of the study. This project received ethical approval from the institutional ethics committee.

Clearance from ethical committee for the study was issued via institute with the reference number of **IEC/2022/KS/MD/27** and the study was registered clinical trial registry with the CTRI number of **CTRI/2024/02/062936**

PROFORMAS USED FOR THE STUDY:

1.   WOMAC SCALE
2.   *PRAKRITI* ASSESSMENT PROFORMA(DR KISHOE PATWARDHAN BHU)

WESTERN ONTARIO AND MCMASTER OSTEOARTHRITIS INDEX (WOMAC)

PATIENT NAME		DOB

Please circle the appropriate rating for each item.

RATE YOUR PAIN WHEN...	NONE	SLIGHT	MODERATE	SEVERE	EXTREME	HOSPITAL USE ONLY
Walking	0	1	2	3	4	
Climbing stairs	0	1	2	3	4	
Sleeping at night	0	1	2	3	4	
Resting	0	1	2	3	4	
Standing	0	1	2	3	4	TOTAL

RATE YOUR STIFFNESS IN THE...	NONE	SLIGHT	MODERATE	SEVERE	EXTREME	HOSPITAL USE ONLY
Morning	0	1	2	3	4	
Evening	0	1	2	3	4	TOTAL

RATE YOUR DIFFICULTY WHEN...	NONE	SLIGHT	MODERATE	SEVERE	EXTREME	HOSPITAL USE ONLY
Descending stairs	0	1	2	3	4	
Ascending stairs	0	1	2	3	4	
Rising from sitting	0	1	2	3	4	
Standing	0	1	2	3	4	
Bending to floor	0	1	2	3	4	
Walking on even floor	0	1	2	3	4	
Getting in/out of car	0	1	2	3	4	
Going shopping	0	1	2	3	4	
Putting on socks	0	1	2	3	4	
Rising from bed	0	1	2	3	4	
Taking off socks	0	1	2	3	4	
Lying in bed	0	1	2	3	4	
Getting in/out of bath	0	1	2	3	4	
Sitting	0	1	2	3	4	
Getting on/off toilet	0	1	2	3	4	
Doing light domestic duties (cooking, dusting)	0	1	2	3	4	
Doing heavy domestic duties (moving furniture)	0	1	2	3	4	TOTAL

PATIENT SIGNATURE	DATE	
REVIEWED BY PHYSICAL THERAPIST	DATE	WOMAC TOTAL SCORE ___ /96

YAVAPAI REGIONAL MEDICAL CENTER
PHYSICAL REHABILITATION SERVICES

WOMAC OSTEOARTHRITIS INDEX QUESTIONNAIRE

REHABILITATION SERVICES
PT THA/TKA WOMAC QUESTIONNAIRE
MR-1433 (11/15)

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Maximum score-96

Minimum score -0

Criteria	Grade
Mild	1-24
moderate	25-49
Severe	50-74
Very severe	75-96

PRAKRITI PROFORMA:

Name of the individual: Age:

Sex: Address:

VATA

Sl. No.	Question/statement	Guna	Is your answer the following?	Scores to be allotted if your answer is the one that is mentioned in the previous Column	Allot the Scores in this column
1.A.	Whether your skin remains dry throughout the year in comparison to others?	Ruksha	Yes	30	
1.B.	Is your body undernourished/ emaciated?	Ruksha	Yes	30	

1.C.	Have you got rough, low, broken or obstructed voice?	Ruksha	Yes	30	
1.D.	Does Your sleep last less than 6 hours per day? Or Can your sleep be disturbed easily?	Ruksha	Yes	30	
2.A.	Do you change walking speed & style from time to time?	Laghu	Yes	40	
2.B.	Do you keep changing your food habits from time to time?	Laghu	Yes	40	
2.C.	Do you keep changing your walking / jogging habit from time to time?	Laghu	Yes	40	

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3	Do you keep your joints, eyes, eyebrows, jaw, lips, tongue, head, Shoulder, hands & feet frequently moving?	Chala	Yes	120	
4.A.	Are you considered a talkative among your friends?	Bahu	Yes	60	
4.B.	Do you have prominent veins & tendons all over the body?	Bahu	Yes	60	
5.A.	Do you generally start the work assigned to you immediately?	Shighra	Yes	15	
5.B.	Do you get irritated easily? (E.g., when you do not get breakfast on time in your hostel or when the power goes off while watching a cricket match or your favourite movie over television)	Shighra	Yes	15	
5.C.	Do you get frightened easily?	Shighra	Yes	15	
5.D.	Do you make friends easily & also lose them easily?	Shighra	Yes	15	
5.E.	Do you generally learn things quickly? Or Do you have a good grasping power?	Shighra	Yes	15	

5. F.	Is your long-term memory week? (E.g., you can remember only few names of your friends at your primary school).	Shighra	Yes	15	
5.G.	Are you more comfortable in summer? Or Do you prefer hot/warm drinks over cold drinks?	Shighra	Yes	15	
5.H.	Do you generally develop symptoms immediately after exposure to common causative factors? (You are easily caught by diseases like flu, allergy during seasonal changes).	Shighra	Yes	15	
6.A.	Do you shiver in winter season more than your friends?	Shita	Yes	60	
6.B.	Do you often feel stiffness in your body after exercise, travelling?	Shita	Yes	60	
7.	Are your nails, teeth, hands, feet and hairs on your body	Parusha	Yes	120	

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	and face rough?				
8.A.	Do you have cracks on the body especially on the heels?	Vishada	Yes	60	
8.B.	Are some crackling sounds produced in your joints during movements?	Vishada	Yes	60	
				960	Total =

PITTA

Sl. No.	Question/statement	Guna	Is your answer the following?	Scores to be allotted if your answer is the one that is mentioned in the previous column	Allot the Scores in this column
1.A.	Are you more comfortable in winter than summer?	Ushna	Yes	17	

1.B.	Among your family members, is your complexion considered fairer?	Ushna	Yes	17	
1.C.	Does your temperature of oral cavity remain towards upper limit of normal range?	Ushna	Yes	17	
1.D.	Do you have excessive black moles, Freckles etc on your skin? Or Have you noticed new appearance of black moles often on your skin?	Ushna	Yes	17	
1.E.	Do you feel excessive hunger & thirst in comparison to others?	Ushna	Yes	17	
1.F.	Have you experienced premature graying, wrinkling of skin & early baldness?	Ushna	Yes	17	
1.G.	Do you have soft, scanty, brown hair on your face, body & head?	Ushna	Yes	17	

2.A.	Do you involve yourself in risky & heroic activities requiring physical strength often?	Tikshna	Yes	24	
2.B.	Do you have ability to digest large quantities of food easily?	Tikshna	Yes	24	
2.C.	Do you take large quantities of food & drink in comparison to others?	Tikshna	Yes	24	
2.D.	Do you get easily irritated for small/negligible problem in day-to-day life?	Tikshna	Yes	24	
2.E.	Do you consume food more frequently than others? (5-6 times/day)	Tikshna	Yes	24	
3.A.	Do you have soft & loose muscle bulk especially around the joints?	Drava	Yes	60	
3.B.	In comparison to others do you pass urine & stool in	Drava	Yes	60	
	large quantities and do you perspire more?				
4.	Do your friends complain of bad smell being emitted from your body & mouth?	Visra	Yes	120	
5.	Do you think you have intense sexual desire?	Amla+ Katu	Yes	120	
				600	Total =

KAPHA

Sl. No.	Question/statement	Guna	Is your answer the following?	Scores to be allotted if your answer is the one that is mentioned in the previous column	Allot the Scores in this column
1.	Whether your skin remains oily throughout the year in comparison to others?	Snigdha	Yes	120	
2.	Are your body-hairs & skin shiny, even when no oil or moisturizer is used?	Shlakshna	Yes	120	
3.A.	Are you considered attractive among your friends?	Mridu	Yes	40	

3.B.	Do even mild or trivial injuries on your body make you upset?	Mridu	Yes	40	
3.C.	Among your family members, is your complexion considered fairer?	Mridu	Yes	40	
4.	Do you think you have intense sexual desire?	Madhura	Yes	120	
5.A.	Have you got well-built muscles?	Saara	Yes	60	

5.B.	Do you change your body posture frequently? (You cannot manage yourself in a stable posture for a long duration.)	Saara	No	60	
6.	Do you have a well- nourished & normally developed body? (You are neither malnourished nor obese.)	Sandra	Yes	120	
7.A.	Are you lazy and disinterested in activities like morning walk/ jogging, swimming or any type of outdoor games?	Manda	Yes	40	
7.B.	Are you slow in consuming the food? (Even after all have left the dining hall, you are still consuming the same amount of food).	Manda	Yes	40	
7.C.	When you go to morning walk or college or office, do you walk slowly in comparison to others?	Manda	Yes	40	
8.A.	If you are assigned any work, do you take some extra time to start it?	Stimita	Yes	40	
8.B.	Do you get irritated easily? (For example, when you don't get breakfast on time in your hostel or when the power goes off while watching a cricket match or your favourite movie on television).	Stimita	No	40	
8.C.	Are you late to develop/ suffer from symptoms after exposure to common causative factors? (For example, during seasonal changes, when your friends are easily caught up with flu etc., you are still healthy among them).	Stimita	Yes	40	

9.	Does your gait (style of walking) change with	Guru	No	120	
	respect to speed or manner frequently?				
10.A.	Do you feel hungry more frequently and do you consume more food in comparison to others?	Shita	No	30	
10.B.	Do you tolerate heat easily?	Shita	Yes	30	
10.C.	Do you consume liquids in more quantity and frequency in comparison to others?	Shita	No	30	
10.D.	Do you perspire less in comparison to others?	Shita	Yes	30	
11.	Are sounds produced frequently in your joints on movement?	Picchila	No	120	
12.A	Have you got a good/ attractive complexion?	Achcha	Yes	60	
12.B.	Have you got sweet & pleasant voice?	Achcha	Yes	60	
				1440	Total =

Total scores scored by an individual for a Dosha ×100 =

Total scores allotted to that Dosha

Final percentage scores for _Vata_ = Final percentage scores for _Pitta_= Final percentage scores for _Kapha_=

Type of _Dehaprakriti_=

OBSERVATIOS AND RESULT:

Table no 1:Comparison of WOMAC Score across _Prakriti_ Types:

Prakriti	WOMAC SCORE		ANOVA	
	Mean	SD	F-value	p-value
PK	29.72	9.59		
VK	39.06	11.70	3.92	**0.023**
PV	33.06	10.63		

Table no 2: Post Hoc Paired Comparisons of WOMAC Score across _Prakriti_ Types

Prakriti Pair	WOMAC SCORE	
	Mean Diff.	p-value
PK vs VK	-9.34	0.026
PK vs PV	-3.34	0.848
VK vs PV	6.00	0.492

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TABLE NO 3: Association of *Sandhishoola* with *Prakriti*:

SANDHISHOOLA	PK		VK		PV		Significance
	No.	%	No.	%	No.	%	
No Pain	0	0.0%	0	0.0%	0	0.0%	chi sq=8.68, p=0.192
Mild Pain	2	16.7%	8	9.6%	2	40.0%	
Moderate Pain, No walking difficulty	6	50.0%	33	39.8%	3	60.0%	
Moderate Pain, walking difficulty	4	33.3%	31	37.3%	0	0.0%	
Severe difficulty	0	0.0%	11	13.3%	0	0.0%	

Table – 4: Association of *Sandhishopha* with *Prakriti*

SANDHISHOPHA	PK		VK		PV		Significance
	No.	%	No.	%	No.	%	
Absent	4	33.3%	16	19.3%	0	0.0%	chi sq=5.16, p=0.523
Less than 10%	4	33.3%	27	32.5%	1	20.0%	
More than 10%	2	16.7%	21	25.3%	3	60.0%	
More than 20%	2	16.7%	19	22.9%	1	20.0%	

STATISTICAL ANALYSIS:

SPSS and Microsoft Excel were used to calculate all of the results. For the study, 100 patients were chosen. One hundred participants participated in the trial.

ANALYSIS OF STATISTICS:

Categorical data were described using percentages and proportions. To investigate relationships, a chi squared test was employed. A p-value that was less than or equal to 0.05 was considered statistically significant. The analyses were conducted using SPSS version 26.0, which was then imported into an MS Excel spreadsheet.

Data summaries were visually represented using bar graphs, doughnut diagrams, and pie charts. ANOVA TEST is used for comparison of prakriti.

CALCULATION AMONG WOMAC SCORE AND PERCENTAGE OF *PRAKRITI* OF SUBJECTS:

While there are some interesting findings about the distribution of *Sandhishopha* (joint swelling) among the various *Prakriti* categories, the overall significance is still unclear (chi-squared = 5.16, p = 0.523). While none of the participants in the PV group reported no Oedema, 33.3% of those in the PK group did, a larger percentage than the 19.3% in the VK group. In terms of Oedema severity, 32.5% of the VK group and 33.3% of the PK group had swelling that was less than 10%. 16.7% of the PK group saw more severe swelling, which was more than 10%. In contrast, the VK group experienced swelling of 25.3%, and the PV with 10%.

DISCUSSION:

A thorough study of the results is being addressed, along with an explanation of their relevance and particular. The debate's objectives are to interpret, explore, and describe the data' significance in light of what the scientific community already understood. It is an essential step in the research process that allows the researcher to communicate the importance and findings of the study.

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