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Cross Sectional Study

DOSHA CHARACTERISTICS INTERPRETED IN ULNAR NERVE CONDUCTION METRICS AND ITS ASSOCIATION ACROSS *DEHA PRAKRITI* TYPES (BODY CONSTITUTIONS)-A CROSS SECTIONAL STUDY.

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ABSTRACT :

Introduction: *Prakriti* (somatic constitution) is a novel A*yurvedic* concept that stresses each person's individualized treatment. The clinical significance of these *gunas(attributes)* can be co-related with the range of nerve conduction. Nerve conduction studies assist in the evaluation of predisposition of neuromuscular diseases by providing a physiologic assessment of the peripheral nerves. This study aims to correlate *the dosha* characters with neuro-muscular conduction study parameters and further study its association with *deha prakriti* types. **Methodology:** This was a cross sectional study where the healthy volunteers of age group between 18-60 years were included and the subjects with a history of neuro-muscular disorders, psychiatric medicines, diabetes, hypothyroidism, hyperthyroidism and any other illnesses which may affect the neurological functions were excluded. The *prakriti* evaluation was done using a standardized CCRAS *prakriti* web portal followed by nerve conduction tests with calibrated OCTOPUS-4 channel Electromyography (EMG) machine. The study parameters were *prakriti* (questionnaire), latency of nerve (milliseconds), nerve amplitude (millivolt), Nerve Conduction Velocity (NCV) (meter per second) on 213 healthy volunteers divided into 10 groups of *prakriti.* Data was analysed using one-way ANOVA followed at p<0.05. **Results**: The Ulnar MNCV of the *vata pradhana prakriti* was higher (78.8 ± 14 m/s), followed by the *kapha pradhana prakriti (*86.91 ± 7 m/s*)*, the *vatakapha pradhana prakriti* had the third highest MNCV followed by *kapha vata pradhana prakriti*. One-way ANOVA showed statistically significant difference between types of *deha prakriti* with consideration of Motor latency 1 and Motor Latency 2 at wrist, which was demonstrated by one-way ANOVA (F(8,204) = 514, p = 0.001) and (F(8,204) = 2.307, p = .022) respectively. **Conclusion**: This study has observed a difference in ulnar motor nerve conduction parameters across *deha prakritis* establishing objective parameters for *kapha dosha-sandra* (thickness), *snigdha* (lubricated) nerve fibres exhibiting faster motor nerve conduction.

KEYWORDS: Ulnar nerve, Nerve conduction, Prakriti, Amplitude, Electromyography, Ayurgenomics.

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1. INTRODUCTION

Prakriti (somatic constitution) represents the unique coding that is valued in an individual's physical, mental, social, and spiritual characteristics. *Prakriti* is the result of the *guna(attributes)* predominance in *doshas* (regulatory functional factors of the body) exhibited by the body anatomically and physiologically. The basic elements that control the body functions are called *doshas*. The *pitta dosha* with *tikshna (sharpness) guna* is in charge of metabolic and chemical activity, the *kapha dosha* causes build-up due to *manda (mildness/slow) guna*, and the *vata dosha* with *chala guna* (mobility/ instability) has quick and rapid movements, which are observed in nerve and muscle action potentials.[1] Comprehending disease prevention, diagnosis, treatment planning, and future illness prognosis are all aided by *prakriti*. This is an innate quality of a person that is established at the moment of conception that reflects each person's distinct physical and mental makeup, which doesn't alter over the course of their lifetime, which can be correlated to phenotypic traits. [2] People with a particular physical constitution (*deha prakriti*) have a particular style of gait and activity. It outlines unique traits that are dictated by a specific and long-lasting *dosha* configuration in an individual.

Nerve conduction tests are one of the novel areas which can be correlated with *prakriti* types. The normal values of ulnar Motor Nerve Conduction Velocity (MNCV) are 50-70 m/sec for a middle-aged healthy individual, but the NCV of the nerve may vary according to genetics and BMI of an individual. Nerve Conduction Studies (NCS) can be used to evaluate peripheral nerve functioning and dysfunctions. According to *Ayurveda,* individuals with *Vata pradhana prakriti* are more active physically and mentally, hence more prone to degeneration than those with *pitta pradhana* and *kapha pradhana prakriti*. [3] Early degeneration can result from lifestyle choices such as increased consumption of fast food, increased quantity of dry food, excessive dieting, sleep disturbances, screen time, and environmental health problems. Nerve conduction parameters are influenced by a wide range of physiological elements, such as nerve diameter and myelination, as well as standardized measurements, temperature, height, gender, and age of healthy individuals. [4] Nerve conduction test values can be linked to the clinical relevance of *gunas* in Ayurveda. In *Ayurvedic* philosophy understanding, *gunas* is very important to know the traits or attributes of diseases like diabetic neuropathy and motor neuron diseases. Through a comprehensive strategy, this correlation of *gunas* with nerve conduction test parameters can improve therapeutic efficacy and diagnostic accuracy.

Researchers from throughout the world have turned their attention to the Indian medical system, or Ayurveda because of increased multiple drug toxicity that affects essential organs. This has made it possible to do integrative medicine research. NCS helps define the quantity and pattern of neural lesions and distinguishes between two primary types of peripheral nerve diseases: demyelination and axonal degeneration. Many studies have been published pertaining to the normative data for the nerves in the upper and lower limbs. However, there has been no investigation into the relationship between nerve conduction and bodily constitutions (*deha prakriti*). Conversely, while the integration of Ayurveda concepts with nerve conduction parameters has shown promising results, it is essential to recognize the applications and limitations of Ayurveda practices. For the best patient care, Ayurvedic and mainstream medicine should continue to work together. Hence, our study aimed to interpret dosha characteristics in ulnar nerve conduction tests. Here the null hypothesis states that there was no difference in ulnar nerve conduction test parameters across *Prakriti, and* further, the alternate hypothesis states the variations in ulnar nerve conduction parameters across different deha prakriti types.

2. MATERIAL AND METHODS:

Study design and site: This is a cross sectional study following the STROBE guidelines. This study was carried at the Hospital screening OPD along with the NCV experts during February to May 2023.

Ethical considerations: In addition to CTRI registration CTRI/2024/03/064326, the Institutional Ethics Committee clearance (BMK/24/SP/01) was acquired.

Eligibility Criteria: The study comprised healthy participants between the ages of 18 and 60 years who voluntarily consented with written document to neurophysiological testing and an evaluation of the Prakriti through CCRAS web portal. Exclusion criteria included diabetes, hypothyroidism, hyperthyroidism, psychiatric medication, neuro-muscular diseases and any other condition that can impair nerve conduction.

3. Methods: The CCRAS *Prakriti* web portal online Version.2 was used for *Prakriti* Evaluation. OCTOPUS-4 channel Electromyography, Nerve conduction study, Evoked Potentials (EMG, NCS, EP) Instrument manufactured at Punjab, India, a computerized calibrated device was used for the ulnar nerve conduction tests.

Procedure for Nerve Conduction Study: The classic twofold stimulation method was used to conduct nerve conduction tests. Keeping the dominant hand on the wooden table, the patient was instructed to sit on a wooden chair. Electrodes were applied to the skin at particular locations along the Ulnar nerve in order to conduct Ulnar Nerve conduction tests. For ulnar motor nerve conduction test, the recording electrode was placed over the belly of muscle being tested while reference electrode was placed distally on the area of little finger with less muscle or bone with the ground electrode placed between the stimulating and recording electrodes. For ulnar sensory nerve conduction test, recording electrode was placed on the distal phalanx of ring finger while the stimulating electrode was placed at the wrist about 10-14 cm proximal to the recording electrode. The ground electrode was placed between the stimulating and recording electrodes , thus EMG graph was obtained as shown in figure no.1 and figure no.2.[5]

Measurement and Stimulation: Surface stimulating electrodes were used to apply square pulses with a wavelength of 0.1 ms and a high enough strength at each stimulus location. For motor Nerve conduction study, the stimulus impulse duration was 0.2 ms, while for sensory it was 0.1 ms. The action potential was picked up by the recording electrodes. For sensory and motor NCV, the ulnar nerve's electrical signal transmission time between the stimulating and recording electrodes were measured [figure no.1]. [6]

Figure no.1 Procedural setting for Ulnar Nerve Conduction test

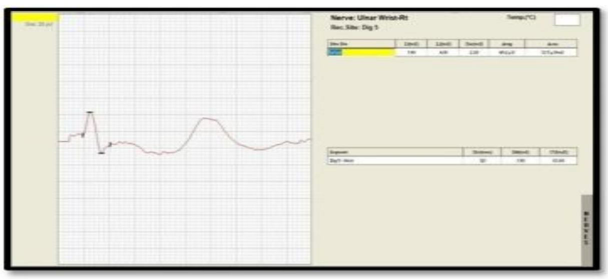

Figure no.2: Ulnar Nerve conduction graph

Parameters for Ulnar nerve conduction: 1. The amplitude of the compound muscle action potential (CMAPA), Conduction velocity of nerves (NCV), Average delay time (milliseconds), Onset/distal latency (DL) 1 and 2, the distal delay, sensory nerve conduction velocity (SNCV), sensory nerve conduction amplitude were recorded from the peak of the negative potential to the peak of the positive potential, sensory latency in order to assess sensory ulnar nerve conduction as shown in Table no.1.

The above parameters of nerve conduction tests are dependent variables which are affected by confounders like BMI, gender, temperature, patient anxiety. Hence to reduce the anxiety the procedure was well explained to the volunteers. All NCV tests were conducted in air-conditioned rooms to maintain a standard temperature of 20°C -27°C. The EMG machine was calibrated on 2 subjects with repeated twice testing on the same volunteers before collected actual data collection. The volunteers were examined and interrogated as per CCRAS prakriti questionnaire by the *Ayurveda* physician to avoid bias in *prakriti* type.

Table no.1 Normative Values of Ulnar Nerve Conduction Studies

Sl. No.	Parameters	Definitions	Normal Range
1	Motor Nerve Conduction velocity-Ulnar (MNCV)	Motor nerve conduction velocity is the velocity of impulse conduction through ulnar nerve. NCV is calculated by dividing the distance by latency. The distance travelled is between the recording electrode and the stimulating electrode's cathode.[4]	49.4 m/s to 63.2m/s
2	Sensory Nerve Conduction velocity- Ulnar (SNCV)	Sensory nerve conduction velocity of ulnar nerve is the somatosensory-induced sensory nerve action potentials (SNAP)[4]	55.22 ± 5.6 m/sec
3	Onset/distal latency (DL) 1 and 2	It is the time taken for the electrical impulse to travel from stimulation site to the recording site. It is measured in	2.97± 0.62 ms

		milliseconds(ms) 2.97± 0.62 ms[4]	
4	The compound muscle action potential (CMAP) amplitude	The size of the response is called amplitude. It is measured in millivolts(mv). Decreased amplitude of CMAP at the wrist is usually sign of an axonal lesion. It is an indication of the number of functional axons and muscles (provided by the area under the peak) which is proportional to the number of depolarized muscles fibers. 7.2 ± 1.4 mV[4]	7.2 ± 1.4 mV

Sample size: Based on the prevalence (p) of neurodegenerative diseases in diabetes in South India (32.2), q=100-p at 95% of C.I., with 5% attrition and a 20% allowable error, 213 healthy participants, both male and female, participated in this study. [7] This is a primary study focusing on collection of normative data on healthy volunteers of various *prakritis.* The ultimate goal would be to develop a diagnosis and management of neurodegenerative diseases like peripheral neuropathy in diabetes.

Participant Groups: All the healthy volunteers were assessed for *Deha Prakriti* types using CCRAS Prakriti web portal online Version.2 under the supervision of Ayurveda Physicians. Based on the type of *deha prakriti,* the 220 volunteers were screened and recruited in the study. Among the total number of participants, 5 volunteers were excluded as they denied for the completion of prakriti assessment and 2 volunteers didn't agree for NCV tests as shown in Figure no.3. This process was monitored by the laboratory assistant who sent these volunteers further for NCV testing.

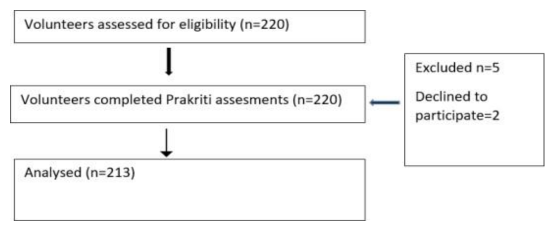

Figure No.3. Subject flow chart through the study.

Statistical Methods: One-way ANOVA was used to examine the data, which was then followed with power tests such as Tukey's post-hoc test. The data was presented as Mean ± SD (standard deviation) with a 95% class interval and an expected normal distribution. Analysis was conducted using SPSS software, version 23.0 developed by IBM, Chicago, USA. Management of missing data: The 2 participants who had given written consent and completed *prakriti pariksha* but were not willing for the NCV tests were considered dropouts. There were no missing data in the study.

Results: The final analysis was done on the data collected from 213 healthy participants between the ages of 18 and 60 years, among which 101 were males and 112 were females. They were grouped as per their prakruti types into 10 groups- 8 volunteers belonged to the *Vata Pradhana Prakruti* group, 36 *Pitta Pradhana Prakriti* group, 4 *Kapha Pradhana Prakriti* group, 18 *vatapitta prakritri*, 3 *vata kapha prakriti*, 36 *pittavata prakriti*, 70 *pitta kapha prakriti*,2 *kaphavata prakriti*, 34 *kapha pitta prakriti* and 1 was from *samadhatuja prakriti*. The details of ulnar nerve motor and sensory parameters are shown in Table no.2 and Table no.3 respectively.

Table 2: The Ulnar Motor NCS parameters of 213 study participants

Prakriti	N	LW1*	LW2†	LE1‡	LE2§	AmpW||	AmpE¶	MNCV**
Vata	8	2.61±0.9	13.90±1.1	7.35±1.8	20.19±1.3	2.13±0.1	14.38±1.2	15.94±3.6
Pitta	36	2.23±0.5	13.45±2.2	6.88±1.4	12.66±4.	13.86±1.5	6.66±1.8	19.04±1.2
Kapha	4	3.50±1.6	12.71±4.5	6.34±5.6	2.61±0.	16.66±2.1	7.37±0.8	20.19±1.3
Vata-pitta	18	2.55±1.3	13.93±1.2	7.11±0.9	2.23±0.	13.90±1.1	7.35±1.8	12.66±4.6
Vata-Kapha	3	3.53±1.3	14.30±1.8	7.04±1.1	2.55±1.	13.45±2.2	6.88±1.4	2.61±0.9
Pitta-Kapha	70	2.31±0.7	13.97±1.5	8.88±0.	3.53±1.	12.71±4.5	6.34±5.6	2.23±0.5
Pitta-Vata	37	2.20±0.5	15.00±1.5	7.28±0.9	2.31±0.7	13.93±1.2	7.11±0.9	3.50±1.6
Kapha-Pitta	34	2.30±0.5	14.38±1.2	7.3	2.20±0.5	14.30±1.8	7.04±1.1	2.55±1.3
Kapha-Vata	1	4.50	6.66±1.8	15.94±3.6	2.30±0.5	13.97	7.28	3.53±1.3
V-P-K	2	2.13	7.37±0.8	19.04±1.	4.50±0	15.00±0.1	7.38	2.31±0.7

*Latency1 at wrist, †Latency 2at wrist‡, §Latency 1at Elbow, ||Latency 2 at Elbow,¶Amplitude at Wrist , **Amplitude at Elbow, ††Motor Nerve Conduction Velocity

Table 3: The Ulnar Sensory NCS parameters of 213 study participants

Prakriti		NCV (sensory)	Sensory Latency1	Sensory Latency 2	Sensory Amplitude
Vata	8	2.20±0.58	13.97±1.52	7.28±0.97	3.53±1.31
Pitta	36	2.30±0.53	15.00±	7.38	2.31±0.78
Kapha	4	4.50±0.2	6.66±1.83	15.94±3.60	2.20±0.58
Vata-pitta	18	2.13±1.5	7.37±0.83	19.04±1.21	2.30±0.53
Vata-Kapha	3	13.86±1.56	7.35±1.83	20.19±1.38	4.50±0.2
Pitta-Kapha	70	16.66±2.15	6.88±1.46	12.66±4.61	2.13±0.5
Pitta-Vata	36	13.90±1.12	6.34±5.66	2.61±0.99	16.66±2.15
Kapha-Pitta	34	13.45±2.26	7.11±0.99	2.23±0.54	13.90±1.12
Kapha-Vata	1	12.71±4.56	7.04±1.14	3.50±1.62	13.45±2.26
V-P-K	1	13.93	8.88	2.55±1.31	12.71±4.56

A one-way ANOVA revealed a statistically significant difference in the types of *Prakriti* when taking MNCV into account ($F(8,204) = 4.493$, $p = .000$) as shown in Table no.4

Table No. 4: One-way ANOVA comparing the Motor conduction characteristics of the Prakriti and ulnar nerves

Parameters		Sum of Squares	df	Mean Square	F	Sig.
NCV Motor	Between Groups	3768.20	9	471.02	4.49	0.000
	Within Groups	21385.35	204	104.83		
Lat 1 at Wrist	Between Groups	16.70	8	2.08	3.51	0.001
	Within Groups	121.22	204	0.594		
Lat. No.2	Between Groups	45.56	8	5.69	2.30	0.022
	Within Groups	503.62	204	2.46		
Lat 1 at Elbow	Between Groups	11.56	8	1.44	0.94	0.482
	Within Groups	312.60	204	1.53		
Lat 2 at Elbow	Between Groups	92.28	8	11.53	2.33	0.020
	Within Groups	1008.62	204	4.94		
Amplitude at Wrist	Between Groups	81.43	8	10.17	0.87	0.539
	Within Groups	2375.47	204	11.64		
Amplitude at Elbow	Between Groups	168.99	8	21.12	1.96	0.053
	Within Groups	2197.97	204	10.77		

There is a statistically significant difference between types of *prakriti* with consideration of Motor latency 1, Motor Latency 2 at wrist which was demonstrated by one-way ANOVA (F(8,204) = 3.514, p = .001) (F(8,204) = 2.307, p = .022) respectively. There is no significant difference between types of *prakriti* with consideration of Motor Latency 1, Motor latency 2 at Elbow as demonstrated by one-way ANOVA (F(8,204) = .944, p = .482) and (F(8,204) = 2.333, p = .020) respectively. There is no significant difference between types of *prakrit*i with consideration of amplitude (at wrist) as demonstrated by one-way ANOVA (F(8,204) = 0. 874, p = .539) respectively. Statistically significant difference was seen between types of *prakriti* with consideration of amplitude (at elbow) as demonstrated by one-way ANOVA (F(8,204) = 1.961, p = 0.05).

Table.no.5: One-way ANOVA comparing the Sensory conduction characteristics of ulnar nerve with *Prakriti*.

		Sum of Squares	df	Mean Square	F	Sig.
NCV (sensory)	Between Groups	1298.448	8	162.306	1.339	.226
	Within Groups	24730.357	204	121.227		
Lat 1	Between Groups	2.056	8	0.257	2.140	.034
	Within Groups	24.500	204	0.120		
Lat 2	Between Groups	19.484	8	2.435	1.851	.070

	Within Groups	268.395	204	1.316		
Amplitude	Between Groups	2659.395	8	332.424	.809	.595
	Within Groups	83822.169	204	410.893		

*df- degree of freedom

There is no statistically significant difference between types of prakriti with consideration of NCV (sensory), Latency 2 as demonstrated by one-way ANOVA (F(8,204) = 1.339, p =0.226) and (F(8,204) = 1.851, p = .070) respectively. There is a statistically significant difference between types of prakriti with consideration of Latency 1 as demonstrated by one-way

ANOVA (F(8,204) = 2.140, p =0.034). No significant difference between types of prakriti with consideration of Amplitude was seen as demonstrated by one-way ANOVA (F(8,204) = 809, p = .595) as shown in Table no.5.

4. DISCUSSION:

Every Prakriti has its unique features exhibited through the gunas. Though there are 7*prakriti* mentioned as per the permutation and combination of doshas, the predominant *doshas* exhibit their characteristics as *Prakriti*.The *vata dosha* is represented by its *ruksha*(dry), *laghu* (lighter), *chala guna* (fast and swift movements) responsible for movements, circulation, co-ordination as seen in nerve action potentials and conduction, the *pitta dosha* with *tikshna guna* (penetrating), *ushna*(warm), *sara* (downward movement) is responsible for enzymatic activity, digestion and metabolism, and the *kapha dosha* causes anabolic and synthetic functions and is represented by the *manda guna*.

The *vata pradhana prakriti* individuals are characterized by more activity, lean body, visible vessels and tendons in the limbs, faster cognitive functions. The *pitta prakriti* individuals are characterised by warm body temperature, moderate built and physical activities, higher metabolism, good at analysis and intelligence. The *kapha pradhana prakriti* are characterised by well-developed built, smooth thick skin, low digestive capacity, less mobility, slow to initate but good at retention. *Dwandwaja prakriti* concept explained by classics explains combined characteristics due to predominance of two doshas.[8]Hence, in the present study as per the *guna* and *lakshan* predominance of *dosha,* 10 groups of *Prakriti* were considered. It was observed that *Vatapitta* predominant *prakriti* have *anushna* (normal body temperature), *ruksha* (dry), *khara*(roughness) qualities when compared to *Pitta Vata Pradhana Prakriti* with *ushna*(warm), *snigdha* (lubricated), *visra*(foul smelling sweating), hence both these prakriti were considered as separate groups. As per the availability of participants and the results of prakriti screening which had to be completed within two months due to study period, equal distribution of samples in each group could not be maintained which becomes the limitation of this study. In the current study, the Ulnar MNCV of the *vata pradhana prakriti* was higher (78.8 ± 14 m/s), followed by the *kapha pradhana prakriti (*86.91 ± 7 m/s*)*. The *vatakapha* *pradhana prakriti* had the third highest MNCV followed by *kapha vata pradhana prakriti*. This indicates that the individuals with *vata* and *kapha* predominance had greater motor nerve conduction. The *vata pradhana prakriti* individuals exhibited the classical characteristics of being faster (*chala*) and having more hand and leg movements (*asthira)* than the *Kapha pradhana prakriti* individuals, who are slower and steadier (*manda*). There are differences in NCV among various *deha prakritis*, as demonstrated by the one-way ANOVA findings showing the association between MNCV and *Prakriti*. We observed some variation in wrist and elbow delay 1 and 2 across several *prakritis.,* MNCV latency 1 at the elbow was noticeably lower in *vata prakriti* which explains the greater MNCV. Previous research by Todnem K., Knudsen G., et al. demonstrated that temperature has an impact on nerve duration. [9] Events at the neuromuscular junction impact latency, and under physiological conditions, a higher temperature can reduce latency. The *pitta prakriti* persons had higher latency 2 at wrist, and latency 1 and latency 2 at elbow, and showing lesser MNCV as compared to others, which could be explained by *pitta's ushna guna*. No other nerve conduction parameters showed any significant association with *prakriti*. The two main factors that determine the forms of *deha prakriti* are height and BMI. Earlier studies observed age and height had a negative impact on amplitude and conduction velocity and a favorable impact on latency, the amplitude and conduction velocities are negatively impacted by higher BMI. [10] A one-way ANOVA revealed a correlation between Prakriti types and ulnar nerve motor conduction velocity. The distal motor latency is a conduction time along the motor axon; it comprises the NMJ (neuro-muscular junction) transmission time, the muscle depolarization time, and the conduction time along the distal motor axon to the NMJ. [4]

The Ulnar nerve motor conduction velocity was faster in *vata pradhana prakriti* and slower in *samadhatuja prakriti*, according to this study. Thus, the study adhered to the objective standards of the *vata dosha's "chala"* (motile) and "*sukshma*" (subtle) *guna* and *Kapha dosha's* having *snigdha* (lubrication) *guna.*

Using one-way ANOVA, our investigation revealed a statistically significant difference between the forms of *prakriti* when amplitude (at the elbow) was taken into account ($F(8,204) = 1.961$, $p = 0.05$). The number of depolarizing muscle fibers is reflected in the CMAP amplitude. Axon loss (as in a normal axonal neuropathy) is the most common cause of low CMAP amplitudes; however, conduction obstruction from demyelination between the stimulation site and the recorded muscle is another possible explanation. In order to diagnose age-related neuropathies, diffuse polyneuropathies, nerve conduction investigations are essential. [11] This study results could not show any clear association between the amplitude and NCV because of lower sample size among each group which was one of the limitations of this study.

It was discovered that *pitta vata pradhana* had a greater mean sensory NCV than both *vata* and *kapha pradhana prakriti.* The ulnar nerve's sensory nerve conduction investigation, however, revealed no correlation between the categories of *prakriti* and NCV (nerve conduction velocity), though in sensory latency 1 and latency 2 (wrist) there was statistical difference between the groups. Compared to motor nerves, sensory nerves have a lower current. Therefore, compared to motor fibers, sensory fibers often have a lower threshold for stimulation. The compound potential known as the sensory nerve action potential (SNAP) is the total of the action potentials of each individual sensory fiber. The potentials of SNAPs are often biphasic or triphasic. Only nerve fibers are evaluated in sensory conduction investigations, and sensory responses are typically quite tiny (typically between 1 and 50 µV). [12] According to Kouyoumdjian JA et al., nerve conduction studies (NCS) can be used to identify the quantity and distribution of neurological abnormalities. It assists physicians in differentiating between the two primary types of peripheral disorders—axonal degeneration and demyelination. [13] According to Awang et al., nerve conduction velocity decreases with age, particularly in the lower limbs in comparison to the upper limbs. [10] Taksande's study showed that advanced ageing is associated with decreased nerve conduction amplitudes, increased latency, and slower conduction velocity. The findings also demonstrated that females have larger sensory amplitudes and higher conduction velocities. [14] The current investigation was able to demonstrate that *vaata prakriti* people have higher MNCV and *pitta prakriti* people have higher Sensory Nerve Conduction Velocity (SNCV), which is consistent with the ideas found in Ayurvedic literature. As the nerve conduction tests use electronic gazettes, safety measures were followed. The EMG machine was rechecked and calibrated by expert technicians before the study. No adverse reactions were found during the study.

Limitations of the study: Increased sample size within the group with gender based analysis can demonstrate better results which is the limitation of this study. Among the participants there 101 were males and 112 were females. Further they were classified into 10 groups as per *prakriti*. However, these participants couldn't be categorized into male and female groups and analyze as the number would be very small for any analysis. There was no equal number of participants in each group due to shorter study period.

Implications: Nerve conduction studies are conducted to get an insight of neuro-muscular system functioning in an individual and detect any nerve dysfunctions.

Generalizability: Nerve conduction parameters are influenced by age, gender, BMI, temperature. This study included healthy middle age volunteers; hence the results of the study cannot be generalized to population of all age groups. However, the normative data obtained from the study can be used for further studies in this field.

5. CONCLUSION: In the present study, higher motor nerve conduction velocity was observed in *vata pradhana prakriti*, followed by *kapha pradhana prakriti*. The higher latency 2 at wrist and elbow was observed in p*itta pradhana prakriti* with lower MNCV. The higher sensory nerve conduction velocity was found in pitta-vata pradhana prakriti. Further, the association in ulnar motor nerve conduction characteristics was found across different forms of *deha Prakriti*. According to

Ayurveda classics, the *Vata pradhana prakriti* is faster in actions and is more prone to degeneration because of its *Chala guna* and *ruksha guna*. This idea can also be linked to the frequency of different neurological conditions in different *deha prakritis*. Early degenerative changes are more likely to occur in *vata pradhana* and *pitta pradhana prakritis*. Individual differences in health and illness can be better understood by using the Ayurvedic ideas of *Prakriti, dosha*, and their *gunas*. These ideas have the potential to improve our comprehension of nerve function and add to contemporary parameters of nerve conduction studies (NCS) and to individualized medical procedures. It is imperative that Ayurvedic knowledge is being integrated with contemporary biomedical science and validated empirically. According to the concepts presented in *Ayurvedic* literature, the present study was able to show that people who were *pitta prakriti* had a larger SNCV (Sensory nerve conduction velocity) and people who were *vaata prakriti* had a higher MNCV(Motor nerve conduction velocity). To comprehend the impact of diverse parameters on the conduction velocities across distinct types of *prakritis*, more research in this area could be necessary. The future scope of this study is to develop preventive procedures, early diagnosis and building management protocol for different *prakritis* suffering from neurodegenerative diseases like peripheral neuropathy with personalized approach.

ABBREVIATIONS:

CCRAS: Central Council for Research in Ayurveda Sciences

NCV: Nerve Conduction Velocity

MNCV: Motor Nerve Conduction Velocity

NCS: Nerve Conduction Studies

OPD: Out Patient Department

EMG: Electromyography

EP: Evoked Potentials

DL: Distal latency

CMAP: Compound muscle action potential

LW1: Latency1 at wrist

LW2: Latency 2 at wrist

LE1: Latency 1at Elbow,

LE 2: Latency 2 at Elbow,

AmpW: Amplitude at Wrist,

AmpE: Amplitude at Elbow

Lat: Latency

NMJ: Neuromuscular junction

SNAP: Sensory nerve action potential

SNCV: Sensory nerve conduction velocity

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