

## PRAKṚTI AS A RISK FACTOR IN MEDOROGA (DYSLIPIDEMIA): A NIDĀNĀTMAKA STUDY INCORPORATING WHO STEPS APPROACH

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### ABSTRACT

**Context:** Prakṛti determines the response of an individual to environmental factors, drugs and susceptibility to diseases making it one of the earliest known concepts of predictive, preventive and personalized medicine. Changing life style of an individual by neglecting the suitability of āhāra and vihāra according to ones Prakṛti has led to many life style disorders. **Aim:** Present study was intended to assess the association of Prakṛti (Constitutional types) as a risk factor in Medoroga with special reference to Dyslipidemia. **Methods:** A Nidānātmaka study was conducted at NIA Jaipur in which 513 subjects of either sex were included after informed consent and the data were collected to measure the risk factors of non-communicable diseases in terms of Prakṛti with special reference to Medoroga (Dyslipidemia) by incorporating WHO STEPS Approach. **Results:** Most of the subjects i.e. 47.17% were of Pitta- Kapha Prakṛti and total 78.74% subjects were of Kapha dominant Prakṛti in the current Nidānātmaka survey. In this study 113 subjects were found Dyslipidemic in which most of the subjects i.e. 41.59% were of Pitta- Kapha Prakṛti and total 77.86% subjects were of Kapha dominant Prakṛti. **Discussion:** In this study it was concluded that Kapha dominant Prakṛti predisposes to Medoroga (Dyslipidemia) and can be considered as an important risk factor in its etiology. So Prakṛti helps us to become aware of the disease we may become prone to, and accordingly helps us to follow a preventive lifestyle.

**KEYWORDS:** Medoroga, Prakṛti, WHO STEPS Approach.

### INTRODUCTION

Prakṛti are discrete phenotypes and they are determined on the basis of physical, psychological, physiological and behavioral traits, and independent of social, ethnic and geographical variables.<sup>[1,2]</sup> Prakṛti of human being depends on genetic and acquired factors. The genetic constitution depends upon Śukra (sperm) and Ōṇita (ovum), while acquired constitution depends on environmental factors like age, gender, race, heredity, climate, season, and region.<sup>[3]</sup>

Prakṛti are classified into Śarīra (body) and mānasa (Psychological) types. The Śarīra Prakṛti is of seven varieties namely vāta, Pitta, Kapha, Vāta-Kapha, Vāta-pitta, Kapha-Pitta and SamaPrakṛti, among which, the first three are considered as extremes. The mānasa Prakṛti is mainly of three types namely Sattva, Rajasa and Tāmasa, among which Sattva Prakṛti is of seven types, Rajasa is of six types and Tāmasa is of three types.

Each doṣa has been ascribed distinct properties and functions. For instance, Vāta contributes to movement, cell division, signaling, excretion of wastes, cognition

and also regulates the activities of Pitta and Kapha. Pitta is primarily responsible for metabolism, thermo-regulation, energy homeostasis, pigmentation, vision, and host surveillance Kapha is responsible for anabolism, growth and maintenance of structures, storage and stability.<sup>[4]</sup>

Prakṛti analysis is the first step of Daśavidha Parīkṣā which is an important tool of clinical examination for the diagnosis and to determine the bala (strength) of the patient. Prakṛti helps us to determine the Agni bala of the patient which in turn helps in dose determination of the drug for the particular patient.

Prakṛti helps us to understand the nature and severity of disease, reaction of body to the drugs (pharmacogenomics), selection of drugs and their doses, prognosis of the disease and preventive measures such as diet, diurnal and seasonal regimes. Prakṛti also determines the response of an individual to environmental factors, drugs and susceptibility to diseases making it one of the earliest known concepts of predictive, preventive and personalized or genomic

medicine. So Prakṛti emphasizes on the individuality and plays an important role in diagnosis, preventive medicine, and therapeutics.

According to Ayurveda Medoroga is a disease of Medovaha srotasa involving meda dhātu. Abnormal accumulation of meda dhātu in the body is known as medoduṣṭi. Medoduṣṭi includes several numbers of other medovikāra, which are collectively known as Medoroga. Most of the Ācārya have stressed upon the role of an unbalanced diet combined with sedentary habits as the important cause of Medoroga. Two types of meda vṛddhi occurs in the body namely badha (poṣya) and abadha (poṣaka) meda vṛddhi. The badha meda vṛddhi leads to adiposity (Obesity) and abadha meda vṛddhi leads to Dyslipidemia.

Dyslipidemia is a disorder of lipoprotein metabolism, including lipoprotein over-production or deficiency. Dyslipidemia may be manifested by elevation of total cholesterol, the bad low density lipoprotein (LDL) cholesterol and triglyceride concentrations and decrease in good high density lipoprotein (HDL) cholesterol concentration in the blood<sup>[5]</sup> i.e. presence of one or more than one abnormal serum lipid concentration. Dyslipidemia is an important risk factor for coronary heart diseases and stroke.

NCEP ATP III define dyslipidemia as total cholesterol (TC) > 200 mg/dl and LDL cholesterol (LDL-C) > 100 mg/dl, triglycerides (TG) > 150 mg/dl and HDL cholesterol (HDL-C) < 40 mg/dl.<sup>[6]</sup>

Dyslipidemia is one of the major modifiable factors for the development of type 2 diabetes,<sup>[7]</sup> atherosclerosis,<sup>[8]</sup> stroke<sup>[9]</sup> and cardiovascular diseases.<sup>[10]</sup> With rapid socioeconomic development and associated lifestyle changes, the prevalence of dyslipidemia has increased dramatically over the past decade.

Increasing obesity and dyslipidemia in south Asians is primarily driven by nutrition, lifestyle and demographic transitions, increasingly faulty diets and physical inactivity, in the background of genetic predisposition. It is becoming one of the major problems leading to metabolic syndrome such as Obesity, diabetes, atherosclerosis, cardiovascular diseases, cerebrovascular diseases, Hypertension and so on. Cardiovascular diseases are measure cause of morbidity and mortality in our society with dyslipidemia contributing significantly to atherosclerosis. Dyslipidemia alone currently affects approximately 10% of global population.

Changing life style of an individual by neglecting the suitability of āhāra and vihāra according to ones Prakṛti has led to many life style disorders. So this study was undertaken to do a Nidānātmaka study of Medoroga (Dyslipidemia) and its clustering with the other risk factors especially Prakṛti of an individual. The clustering of risk factors such as overweight and obesity (BMI

>25), age (>40 years), sedentary habits, smoking, alcoholism, hypertension etc. were studied. Early diagnosis and intervention of Dyslipidemia and related cluster of risk factors can prevent the cardiovascular events and various complications.

WHO STEPS methodology, provides a framework for the surveillance of risk factors of NCDs.<sup>[11]</sup> Settings approach has been recommended as a strategy by WHO, for targeting large groups of population at a time.<sup>[12]</sup> General societies having productive populations need special attention owing to their higher vulnerability for NCDs. Thus the present study was planned with an objective to identify the risk factors of NCDs in all categories of the society with special reference to Prakṛti as a risk factor in Medoroga (Dyslipidemia).

### AIMS AND OBJECTS

1. To Conduct a Survey to gather data for measurement of risk factors of non-communicable diseases, in terms of Prakṛti with special reference to Medoroga (Dyslipidemia).
2. To understand Nidānātmaka role of Prakṛti as a risk factor in Medoroga (Dyslipidemia).

### MATERIALS AND METHODS

The population of 513 subjects of age group 18 – 60yrs of either sex was included in the Nidānātmaka study. The participants were selected from the pool of the patients reporting to OPD/ IPD/ Laboratory of National Institute of Ayurveda SSBH Kishanpole, and Satellite Hospital Jawaharnagar Jaipur and various camps organized by NIA. Informed Consent was taken from the respondents before initiation of the study. A structured questionnaire was administered to each subject of Nidānātmaka survey to collect data on Prakṛti, Socio-demographic profile, āhāra-sātammya (Dietary Pattern) and Sattva (Mental status) and other Ayurvedic variables.

Anthropometric measurements were taken by standard methodology. Weight and Fat percentage was recorded using Omron body Fat monitor. Blood glucose and Lipid profile was also measured by standard methodology.

Out of 513 participants only 351 gave their consent for biochemical measurement and rest 162 participants were excluded from the study. About 113 subjects were found Dyslipidemic out of total 351 subjects.

### METHODOLOGY

The World Health Organization (WHO) for years has been promoting a STEP wise approach (STEPS) for chronic disease risk factor surveillance.<sup>[13]</sup> The STEPS approach involves data collection in 3 steps:

- Step 1: Questionnaire
- Step 2: Physical measurements
- Step3: Collection of blood samples for biochemical measurement.<sup>[14]</sup>

### Step I: Questionnaire: Prakṛti, Socio-economic and behavioral risk profile

A structured questionnaire on Prakṛti analysis, Socio-demographic profile, āhāra-sātamya (Dietary Pattern) and Sattva (Mental status) and other Ayurvedic variables was prepared in Microsoft Excel. The researcher collected data from each subject of nidānātmaka survey by interview method.

### Step II: Physical measurements (Anthropometry)

Anthropometric measurements were taken by standard methodology. Weight and Fat and Visceral fat percentage was recorded using Omron body Fat monitor. The following parameters were measured for this study:

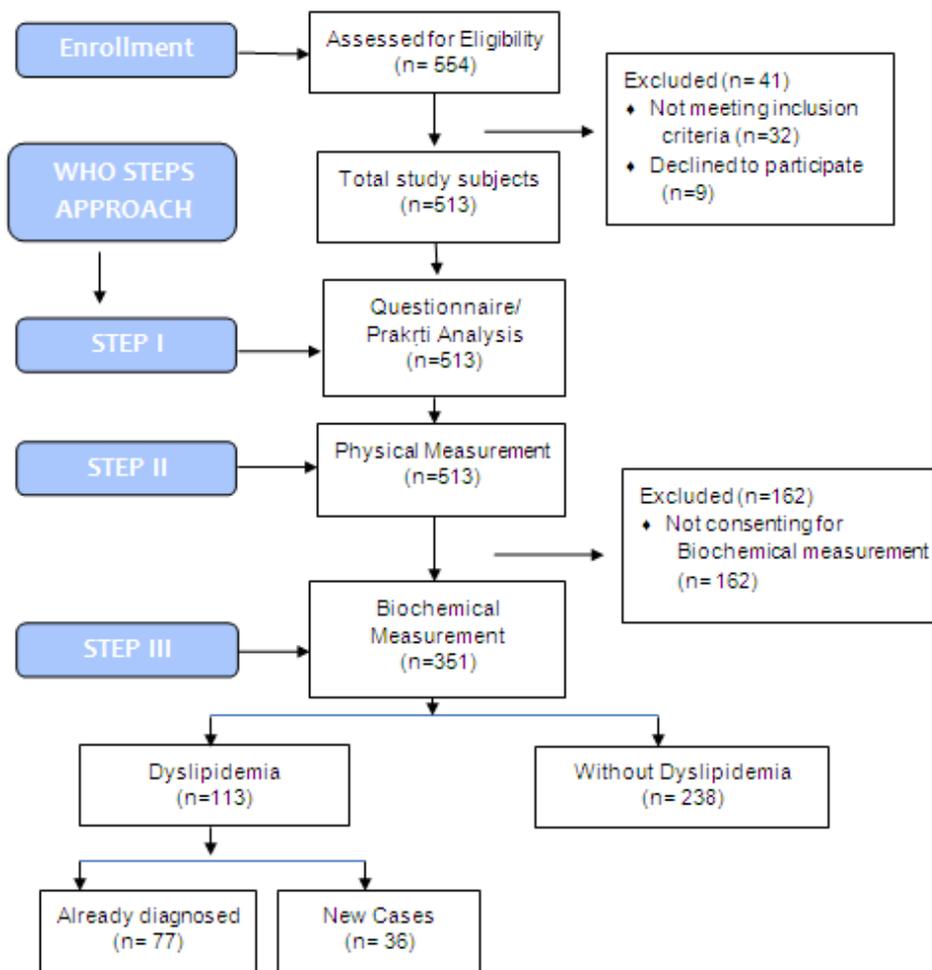
- Height
- Weight

- BMI
- Body Fat Percentage
- Visceral Fat
- Waist Circumference
- Blood Pressure

### Step III: Biochemical measurement: Laboratory Investigations

Biochemical measurements (Fasting Blood glucose and Lipid profile) were also measured by standard methodology. Fasting blood samples were collected after 14 hour fasting. Cholesterol, triglyceride, HDL were measured by using CHOD PAP, LIP/GK, enzymatic clearance method respectively, and LDL and VLDL were calculated by Friedewald formula.

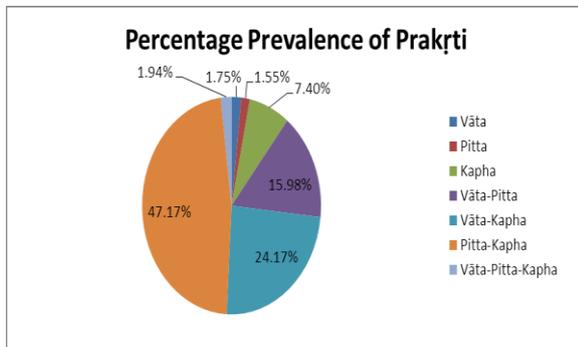
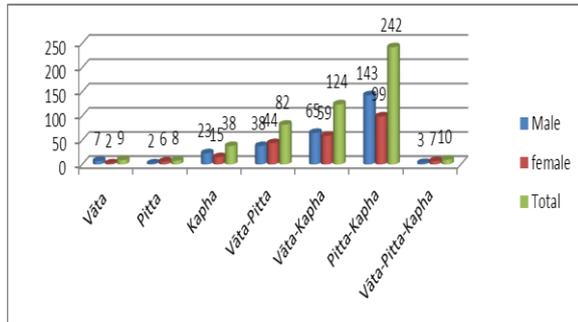
### FLOW DIAGRAM



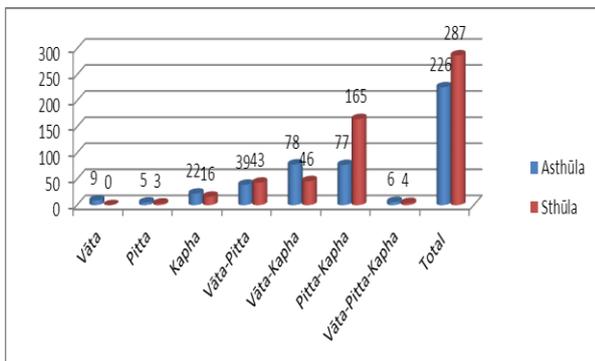
The maximum numbers of individuals (39.37%) were found in the age group 31-45, followed by age group 46-60 (33.33). The percentage prevalence of gender profile shows that 60.23% were males and 39.76 % were females and 57.89% subjects were married.

Percentage prevalence of Prakṛti profile of study subjects (n=513) shows that maximum number of individuals

were found to be Pitta-Kapha Prakṛti 242 (47.17%) followed by Vāta-Kapha Prakṛti 124 (24.17%) and Vāta-Pitta Prakṛti 82 (15.98%) and less percentage was found of Kapha Prakṛti 38 (7.40%), Samadoṣa Prakṛti 10 (1.94%), Vāta Prakṛti 9 (1.75%) and Pitta Prakṛti 8 (1.55%). The maximum number of kapha dominant Prakṛti individuals was found in this study i.e. 404 (78.75%).



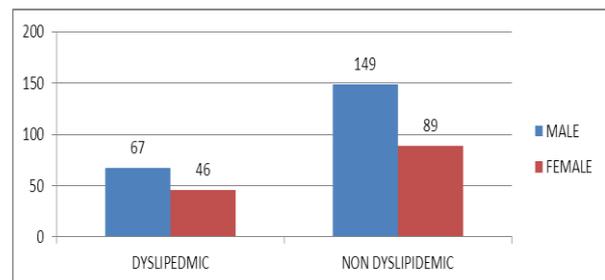
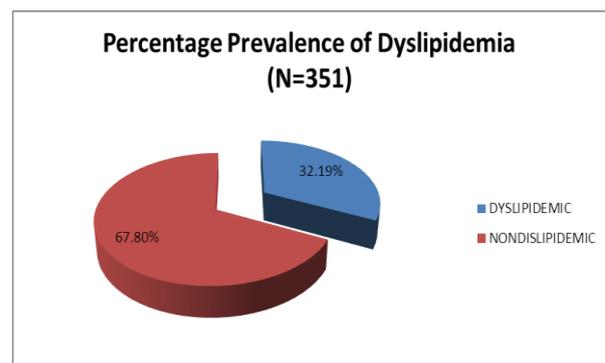
The BMI profile of study subjects shows that 55.94% subjects were found to be Sthūla/Obese (BMI >25). The maximum numbers of Sthūla persons were found in Pitta-Kapha Prakṛti (47.17%) followed by Vāta-Kapha Prakṛti and none of the subject was found Sthūla in vāta Prakṛti. Among the Sthūla persons the highest percentage was found in the age group 30-45 (47.38%), in male gender (62.02%), in middle socio-economic class (55.05%), in married (77.35%), in graduates (28.91%), in jāṅgala deśa (68.64%), in persons with mixed dietary pattern (52.61%), in mild physically active persons (82.92%), and in tea addicts (29.96%).



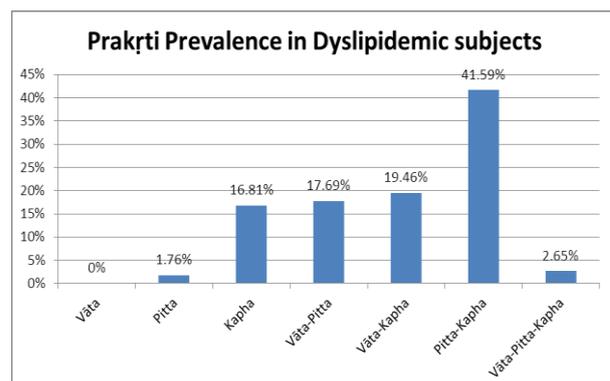
The percentage prevalence of Body Fat % profile of study subjects shows that 41.10% males were at higher risk having body fat percentage greater than 25. While as 21.56% females were at higher risk having body fat percentage greater than 35. The percentage prevalence of Visceral Fat Index (VFI) shows that higher risk (VFI>15) was found in male (8.34%) while as in females it was 6.6%. Percentage prevalence of Waist circumference shows that 40.54% males were having WC > 102 cm while as 23.97% females were having WC >88 cm.

Increased fasting glucose (FBS >110 mg/dl) was found in 21.93% subjects, 68.81% were having SBP of 110-140 mmHg and this was found in maximum number of Sthūla subjects (55.94%), 71.53% were having DBP of 70-90 mmHg and this was found in maximum number of Sthūla subjects (60.23). The family history of Dyslipidemia was present in 22.41% subjects in which 18.12% were Sthūla subjects.

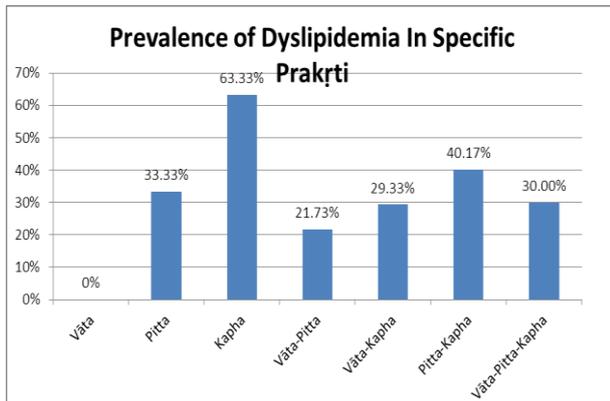
The biochemical measurement was done only in 351 subjects as the rest 162 subjects did not give their consent for the same. Out of 351 study subjects, 113 (32.19%) were found Dyslipidemic. Among the dyslipidemic subjects 87.61% were Sthūla (BMI >25) and males (19.08%) were found more affected than females (13.10%).



Among dyslipidemic subjects 41.59% were of kapha-Pitta Prakṛti followed by vāta-Kapha Prakṛti (19.46%) and none of the subject was found dyslipidemic in Vāta Prakṛti. Total Kapha predominant Prakṛti in dyslipidemic subjects were found to be 80.51%.



Percentage prevalence Prakṛti profile of Dyslipidemic subjects in their respective Prakṛti shows that the maximum prevalence of dyslipidemia in Kapha Prakṛti (63.33%) followed by Pitta-Kapha Prakṛti (40.17%) and zero percent prevalence in vāta Prakṛti.



The study also revealed that the maximum numbers of Hypertensive subjects were found in Vāta-Kapha Prakṛti (50.00%). The maximum prevalence of increased FBS were found in Vāta-Kapha Prakṛti (30.66%) followed by Pitta-Kapha Prakṛti (27.35%). The maximum numbers of subjects with increased Body Fat % were found in Pitta-Kapha Prakṛti (92.97%) followed by Kapha Prakṛti (86.84%). The maximum numbers of subjects with increased Visceral Fat Index were found in Pitta-Kapha Prakṛti (89.66%) followed by Vāta-Kapha Prakṛti (83.47%). The maximum numbers of subjects with increased Waist Circumference were found in Pitta-Kapha Prakṛti (79.75%) followed by Kapha Prakṛti (73.68%).

## DISCUSSION

Prakṛti makes every person unique therefore no person can be exactly like other person. Physical, physiological, psychological characteristics differ from one person to other person depending on his/her Prakṛti. Prakṛti helps us to become aware of the disease we may become prone to, and accordingly helps us to follow a preventive lifestyle.

Most of the subjects were of Pitta-Kapha Prakṛti (47.17%) and about 78.75% subjects were of Kapha dominant Prakṛti. Among Dyslipidemic subjects about 41.59% were of Pitta-Kapha Prakṛti, and 77.86% subjects were of Kapha dominant Prakṛti.

The percentage prevalence of Dyslipidemia in different Prakṛti traits shows that Kapha Prakṛti predisposes more to dyslipidemia (63.33%) followed by Pitta-Kapha Prakṛti (40.17%) and zero percent prevalence in vāta Prakṛti. The prevalence of other risk factors was also found highest in Kapha dominant Prakṛti.

The serum levels of cholesterol, triglycerides, VLDL and LDL cholesterol were higher and less levels HDL cholesterol was found in subjects with Pitta Kapha

Prakṛti. Prasher et al. found high levels of triglyceride, total cholesterol, VLDL and low levels of HDL in Kapha individuals in healthy subjects.<sup>[15]</sup>

The present survey study revealed that kapha Prakṛti is more susceptible to develop Dyslipidemia and with the course of time may cause various complications. It was also observed that kapha Prakṛti persons are more susceptible to gain weight (BMI >25) and central obesity (elevated waist circumferences) which are risk factors to develop Dyslipidemia first and then may lead coronary Heart Disease (CAD).

It may be presumed that dominance of Pitta-Kapha Prakṛti has got some positive relationship with Medoroga (Dyslipidemia) and other cardiovascular risk factors. These factors may be taken as a lead and further studies may be designated to explore this relationship. There were some limitation of the study such as male predominance, more vegetarians, more middle class subjects and more Hindu subjects and less number of cases in some groups of Prakṛti which was due to region specificity. This study was done on less number of subjects and needs further verification by a large metacentric study.

## CONCLUSION

It was concluded from the study that Prakṛti plays an important role as risk factor in Medoroga (Dyslipidemia). Hence identifying an individual with Pitta Kapha and Kapha Prakṛti will help in taking precautionary measures for future risk of Medoroga (Dyslipidemia).

So it was concluded from this survey study that Prakṛti plays an important role in susceptibility of a person towards specific diseases. Prakṛti helps us to become aware of the disease we may become prone to, and accordingly helps us to follow a preventive lifestyle. Prakṛti analysis and modification of āhāra and vihāra i.e., life style of a person may help in prevention of further advancement of the disease. Prakṛti based guidelines for diet and lifestyle result in healthy tissues and homeostasis of Doṣa. Therefore, this unique but paramount important tool of assessment should be considered first before kicking off the proceeding of preventive measures and management. In this way Prakṛti analysis may prove an important tool in predictive, preventive and personalized medicine.

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