

Variation in skin hydration on the basis of *Deha Prakriti* (body constitution): A cross-sectional observational study

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Abstract

Background: *Prakriti* (body constitution) is an important concept of Ayurveda which is decided at the time of birth. It shows differences in physical, physiological and psychological characteristics of an individual. Variation in skin characteristics is found as per *Prakriti*. **Aim:** The aim of the present work was to study hydration of skin over volar forearm in people with different *Prakriti* with the help of skin diagnostic SD 27 instrument. **Subjects and Methods:** This was a cross-sectional study conducted at Cosmetic Technology Department in unmarried healthy female students of (18–30 years). A total of 904 volunteers were screened, of which 621 volunteers were further examined for *Deha Prakriti* for screening of single *Dosha* dominant *Prakriti*. 58 *Vata*, 70 *Pitta* and 61 *Kapha* dominant *Prakriti* were eligible for further study, but on actual day of skin examination, 50 volunteers in each group completed the study. Skin hydration was measured by skin diagnostic SD 27 instrument. **Results:** It was found that maximum people with *Vata* (92%) and *Pitta* dominant *Prakriti* (70%) had less hydration while (48%) *Kapha* dominant *Prakriti* volunteers had normal to dehydrated skin. Chi-square test was used for analysis. The Chi-square value is 45.9 and $P = 0.0001$, which is highly significant. **Conclusion:** The skin of *Vata* and *Pitta* dominant *Prakriti* had less hydration while hydration was well maintained in *Kapha* dominant *Prakriti* than that of *Vata* and *Pitta* *Prakriti* people.

Keywords: *Kapha*, *Pitta*, *Prakriti*, skin diagnostic 27, skin hydration, *Vata*

Introduction

Ayurveda is an ancient science of life. It attributes primary aim towards prevention of disease and maintenance of health.^[1] *Prakriti*, an important concept of Ayurveda, is a combination of physical, physiological and psychological characteristics. *Prakriti* means overall nature of an individual. According to *Sushruta*, *Prakriti* remains inherited throughout the life.^[2] In Ayurveda concepts of personality and beauty are explained under the heading of *Prakriti*, *Sara* (state of excellence of body constituents) and *Pramana* (optimum desirable measurement of the body constituents).^[3] *Prakriti* has been one of the most notable basic feature of Ayurved health-care philosophy; it fundamentally explains biological specificity operating at cellular and genomic level, held largely responsible for distinctions among individuals in various aspects such as function and appearance.^[4] [Ayurveda identifies the best set of substrate such as *Aahara* (dietary pattern) and *Vihara* (routine behavior) to be useful to optimize the system performance in regards to *Prakriti*

subtypes]. It is, therefore, clear that knowledge of *Prakriti* subtype may go a long way in health maintenance by making one aware of suitable and unsuitable substances applicable on one to one basis.^[5] Based on predominance of individual *Dosha* at the time of conception, there are three major types of *Prakriti* named as per the predominance *Dosha*, i.e., *Vata*, *Pitta* and *Kapha*. The *Prakriti* is believed of to be determined at the time of conception and along with it is influenced by the milieu interior of the womb, the dietary habits, and lifestyle of the mother.^[6] Variation in skin characteristics are found as per the predominance of *Deha Prakriti*.^[7] Cosmetic field is gaining wide importance, in view of upliftment of health standards and awareness. The skin problems are also increasing which cause damage to beauty due to modified

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lifestyle and polluted atmosphere. The overuse and misuse of cosmetics is also affecting skin health.^[8] According to Sante, the prevalence of skin disorder associated with cosmetic use was 69.2%.^[9] This study was conducted to evaluate occurrence of cutaneous complication among women who used bleaching cosmetics in Lome in 1997. Scope of Ayurveda in the field of cosmetology is mainly due to its unique concepts of maintenance of beauty with lesser side effects. It requires knowledge of *Prakriti* along with cosmetic science while choosing any cosmetic formulation; otherwise, random use of cosmetic may cause adverse effect to beauty.

Good skin hydration is essential to maintain a healthy and youthful complexion. The most important factor that regulates the hydration in stratum corneum are lipids, sebum, natural moisture factor and aquaporin in skin. The water content of skin also varies widely from site to site, palm << forehead < back and abdomen < forearm and upper arm. The appearance of wrinkles on the skin of the aged individual gives rise to the notion that aged skin is drier than the skin of young adults.^[10]

Stratum corneum should contain more than 10% of water to look normal. Usually, when water is lost due to evaporation the moisture is restored from the lower epidermal layer and dermis. Thus, to maintain healthy skin, the phenomenon of water loss and replenishment should be balanced. Water content of stratum corneum depends on four key processes - stratum corneum water binding capacity, stratum corneum barrier properties, water gradient across the stratum corneum, and viable epidermal stratum corneum transporter function.^[11]

In the present study, skin hydration was measured with the help of skin diagnostic SD-27 instrument. The main aim was to study skin according to different predominant *Deha Prakriti* with respect to skin hydration at volar forearm.

Subjects and Methods

This was a cross-sectional study conducted at Government Ayurved College and Cosmetic Technology Department of other colleges. In this study, volunteers were studied single time. A total of 904 volunteers were initially screened with the help of screening proforma (consisting of inclusion and exclusion criteria). Total 621 volunteers fulfilling screening criteria were further examined for *Prakriti* analysis until getting dominant *Prakriti* (>65% criteria of single *Prakriti*). Total 58 people with *Vata*-dominant *Prakriti*, 70 *Pitta*-dominant *Prakriti* and 61 *Kapha*-dominant *Prakriti* were eligible for further study; however, on actual day of skin examination, 50 volunteers in each group completed the study and remaining dropped out during washout period. In washout period, 10 days before skin examination all volunteers were instructed not to apply any cosmetics on skin. The volunteers who could not follow instructions were excluded from the study.

Inclusion criteria

The following criteria were considered for inclusion:

Unmarried healthy females volunteer, mostly students having age between 18-30 years, residing in 50 km periphery area from the study site for past 6 months and from middle socioeconomic class and willing for consent.

Exclusion criteria

The following criteria was considered for exclusion:

Volunteers who had participated in any other clinical trial 4 weeks before enrollment in this study, volunteers with a history of anemia, any allergic disorder or family history of congenital or hereditary disorders, with a history of traveling in another environment in the past 4 weeks, volunteers with premature signs of skin aging and volunteers with addiction of smoking and chronic alcohol intake.

The volunteers fulfilling the eligibility criteria were enrolled for further study after signing consent form.

Skin examination

In this study, skin hydration was measured with the help of skin diagnostic SD-27 instrument.^[12] This instrument is manufactured by Courage + Khazaka Electronic GmbH, Germany. SD-27 is a type of skin testing instrument enabling beauty therapist, pharmacist to inform patients their actual skin condition on the basis of various parameters. This instrument has gained special attention from the researcher because of its easy handling, accuracy and short measurement time. Due to its small size and battery based operation, it is possible to use it anywhere. The device analyzes oil and moisture content of the skin surface. The measurement principle of this instrument is based on for oil: photometric (scale 0–9) and for hydration: capacitance (scale 0–99). The probe of SD-27 was kept on the volar forearm for few seconds and its result was displayed in linear value between 00 and 99. The value obtained by this instrument was categorized as in Table 1.

In the present study, the observations of skin hydration were interpreted as per Table 1. To avoid the effect of weather, the study was carried out only in one season. The mean maximum temperature was 29.36°C and mean relative humidity was 56.81 (data obtained from Indian Metrology Department, Nagpur) during actual skin examination period in the study area. After enrollment, 10-day washout period was given to all volunteers. Volunteers were instructed not to apply any cosmetics on their hands. The skin hydration was measured from volar forearm of both the hands. Three readings from each hand were taken and the mean of all six readings was considered as final result.

Table 1: Interpretation of results by skin diagnostic SD 27 instrument

Skin condition	Results
Very dry	0-40
Normal to dry	41-60
Normal	61-99

Results

Out of total 150 volunteers, the age-wise distribution of 50 volunteers of *Vata Prakriti* showed that 39 (78%) were from 21–23 years age group, 7 (14%) were from 24–26 years, and 4 (8%) were from 27–29 years age group. Out of 50 volunteers of *Pitta Prakriti*, 42 (84%) were from the age group of 21–23 years, 6 (12%) were from 24–26 years, while 1 (2%) was from 27–29 and 2% were of 30 years. Out of 50 volunteers of *Kapha Prakriti*, 44 (88%) volunteers were from 21–23 years age group and 6 (12%) were from 24–26 years age group [Tables 2-4].

Skin hydration of *Vata Prakriti* showed that 92% of volunteers had very dry skin and 8% had normal to dehydrate skin. Analysis of skin examination of *Pitta Prakriti* revealed that 70% of volunteers had very dry skin, 26% had normal to dehydrated skin and remaining 4% had normal skin hydration. Skin examination of *Kapha Prakriti* people revealed that, 48% of volunteers had normal to dehydrated skin, 30% had very dry skin and 22% had normal skin [Table 5].

For statistical analysis, Chi-square test was applied. The Chi-square value was 45.9 and $P < 0.0001$ showed high statistical significance.

Discussion

In the present study, out of 150 volunteers, maximum volunteers, i.e., 125 (83.33%) were from 21 and 23 years age group. In this study, the mean age of volunteers was 22.14 years. This may be due to awareness of skin health in the young college-going students. Age has direct relationship with *Dosha* predominance. In pediatric age, *Kapha Dosha* dominance is observed; in young age, *Pitta Dosha* dominance is observed while *Vata* dominance is observed in old age. As age advances physiologically *Vata* predominance occurs. Hence, this study was conducted on 18–30 years volunteers occurs. The female volunteers were selected because gender wise variation of skin is well known.^[13]

In the present study, out of 150 volunteers, maximum volunteers, i.e., 97 (64.66%) were pursuing their graduation and 107 (71.33%) volunteers had normal body mass

Table 2: Age-wise distribution of enrolled volunteers (n=150)

Age (years)	Number of volunteers			Total, n (%)	P
	<i>Vata Prakriti</i> (n=50), n (%)	<i>Pitta Prakriti</i> (n=50), n (%)	<i>Kapha Prakriti</i> (n=50), n (%)		
18-20	0	0	0	0	0.179
21-23	39 (78)	42 (84)	44 (88)	125 (87.75)	df=2
24-26	7 (14)	6 (12)	6 (12)	19 (12.73)	
27-29	4 (8)	1 (2)	0	5 (3.33)	
Up to 30	0	1 (2)	0	1 (0.67)	
Total	50 (100)	50 (100)	50 (100)	150 (100)	

Table 3: Education-wise distribution of enrolled volunteers (n=150)

Education	Number of volunteers			Total (%)	P
	<i>Vata Prakriti</i> (%)	<i>Pitta Prakriti</i> (%)	<i>Kapha Prakriti</i> (%)		
Higher secondary	11 (22)	12 (24)	10 (20)	33 (22.00)	0.886
Graduate	34 (68)	30 (60)	33 (66)	97 (64.68)	df=4
Postgraduate	5 (10)	8 (16)	6 (12)	19 (12.66)	
Doctorate	0	0	1 (2)	1 (0.66)	
Total	50 (100)	50 (100)	50 (100)	150 (100)	

Table 4: Agni wise distribution of enrolled volunteers (n=150)

Agni	Number of volunteers			Total (%)
	<i>Vata Prakriti</i> (%)	<i>Pitta Prakriti</i> (%)	<i>Kapha Prakriti</i> (%)	
<i>Vishamagni</i> (Irregular digestion)	45 (90)	0	6 (12)	51 (34.00)
<i>Tikshanagni</i> (Increased digestion)	3 (6)	50 (100)	8 (16)	61 (40.68)
<i>Mandagni</i> (Decreased digestion)	2 (4)	0	35 (70)	37 (24.66)
<i>Samagni</i> (Normal digestion)	0	0	1 (2)	1 (0.66)
Total	50 (100)	50 (100)	50 (100)	150 (100)

Table 5: Skin hydration wise distribution of enrolled volunteers (n=150)

Hydration#	Number of volunteers			Total (%)	P*
	Vata Prakriti (%)	Pitta Prakriti (%)	Kapha Prakriti (%)		
Very dry	46 (92)	35 (70)	15 (30)	96 (64.00)	<0.0001
Normal to dehydrated	4 (8)	13 (26)	24 (48)	41 (27.34)	
Normal	0	2 (4)	11 (22)	13 (8.66)	
Total	50 (100)	50 (100)	50 (100)	150 (100)	

Very dry: 0–40, Normal to dehydrated: 41–60, Normal: 61–99, *P>0.05 - insignificant, P<0.05 and <0.01 -significant and P<0.001 - highly significant

index (BMI). In this study, all the volunteers were healthy, so BMI of most of the volunteers was normal and it also indicates health awareness in college-going students.

In the present study, out of 50 *Vata* dominant *Prakriti* volunteers, maximum 45 (90%) had *Vishmagani* (variant digestion). In *Pitta* dominant *Prakriti* group, all volunteers had increased digestion pattern; this may be due to *Ushna* (hot) and *Tikshana* (Sharp) property of *Pitta Dosh*. In *Kapha* dominant *Prakriti* group, 35 (70%) volunteers had low appetite.

Stratum corneum hydration has an important role in skin function such as regulating epidermal proliferation, differentiation and inflammation. Marrakchi and Maibach^[14] reported that the old individual has least hydrated skin than younger due to decrease in natural moisturizing factor in old age. Diridollou et al.,^[15] in 2007, reported that hydration of skin is influenced by ethnicity. In the present study, it was found that 46 (92%) of *Vata Prakriti* and 35 (70%) of *Pitta Prakriti* volunteer had less hydration while 24 (48%) of *Kapha Prakriti* volunteer had normal to dehydrated skin. This variation is due to different characteristics of different *Dosha* dominance. *Vata Dosh* has predominance of *Vayu* (air) and *Akasha Mahabhuta* (space elements) which increases dryness of skin. *Vata Dosh* has dryness which causes evaporation of liquid or secretion so that water cannot be retained for longer time, leading to dryness. In *Pitta Prakriti*, *Pitta Dosh* has *Teja Mahabhuta* (fire elements) predominance. *Ruksha* (dry), *Khara* (rough) and *Vishada* are the characteristics of *Teja Mahabhuta*. This *Teja Mahabhuta* is in combination with *Jala Mahabhuta* (water elements) which imparts little unctuousness to skin. *Sushruta* has mentioned that *Pitta* has dry characteristics so these characteristics may be responsible to maintain less hydration in skin. In *Kapha Prakriti*, *Kapha Dosh* has predominance of *Jala* and *Prithvi Mahabhuta* (earth element). *Jala Mahabhuta* (water element) has *Drava* (liquid), *Stimit* (wet or moist), *Shita* (cold) and *Snigdha* property. *Jala Mahabhuta* (water element) is responsible to maintain moisture in body, which performs *Snehana Karma* (maintain oiliness) of *Kapha Dosh*. In *Kapha Prakriti*, the rate at which water reaches to stratum corneum from body is high and evaporation rate is less. Hence, the ability of stratum corneum to hold water is high. According to Hemadri, *Sneha* property causes *Kledana* (water-lodging retention of moisture) that moisturizes the skin. *Kledaka Kapha* maintains adequate hydration.

So it can be said that the skin of *Vata* and *Pitta*-dominant *Prakriti* requires more *Sneha Dravya* (combination of humectants and emollient in equal concentration) while *Kapha*-dominant *Prakriti* requires less *Sneha Dravya* (only humectants).

Conclusion

From the present study, it was observed that maximum number of *Vata* (92%) and *Pitta* (70%) dominant *Prakriti* had very dry skin and *Kapha Prakriti* volunteer had normal (22%) and normal to dehydrated skin hydration (48%). So it can be concluded that the skin of *Vata* and *Pitta*-dominant *Prakriti* healthy individuals had less hydration while hydration was maintained in *Kapha*-dominant *Prakriti* healthy individuals than *Vata* and *Pitta* dominant *Prakriti* person.

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Conflicts of interest

There are no conflicts of interest.

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