

Association of Vital Signs into Particular Types of *Prakriti* in Healthy Infants

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ABSTRACT

Background: "*Prakriti*" is a basic clinical denominator in our traditional system of medicine, which defines physiological, physical and psychological traits of an individual and it is also the template for individualized lifestyle, diet, and treatment. There are many parameters to assess *Prakriti* of infants, vital signs is one of them because vital signs are often considered to be the baseline indicators of an individual health status.

Objective: This study explore the association of vital signs into particular types of *Prakriti* in healthy infants

Method: *Prakriti* of 96 infants was assessed through PRS-IPA (Prototype Research Software for Infant *Prakriti* Assessment) software, The temperature, heart rate (HR) and respiratory rate (RR) were assessed by inspection/ palpation method and manually, The data of each infant was recorded on infant assessment Performa and categorized on Microsoft excel 2010 after that final statistical analysis was done by SPSS 20.

Observation and Result: The mean temperature of *Vata* and *Pitta Prakriti* has shown statistically significant variation in all follow-ups. However the *Vata Prakriti* infants has shown minimum mean temperature during the study period, while maximum mean temperature has been seen at registration in *Pitta Prakriti*, FU1 in *Kapha Pitta*, FU2, FU3 and FU 4 in *Vata Pitta Prakriti*.

In case of single *Prakriti* infants, significant and consistent decline in respirator rate was observe in infants of *Kapha Prakriti*, *Kapha-Pitta*, *Vata-Pitta* and *Vata-Kapha*, while infants of *Vata Prakriti* shows relatively less decline Respiratory Rate during the first 9 months. The mean respiratory rate at birth has shown higher in *Vata Prakriti* than infants of other types of *Prakriti* at registration and was sustained till final follow ups

Discussion and Conclusion: The present study exemplifies the association of vital and *prakriti* of infants, which is in conformity with textual references in Ayurveda. For example, the higher temperature and heart rate of baby may belong to *Pitta* and *Kapha* characteristics, *pitta Prakriti* have *Ushnamukha* and *Ushnasharira*, while *Kaphaja Prakriti* infants have *Alpa Santapa* (low temperature) and shows that of *Kapha* resulting low heart rate while increased temperature along with high heart rate occurs in *Pitta Prakriti* and the ayurvedic physician has a good correlation with PRS-IPA measurements, thereby providing an effective and quantitative instrument to assess the *prakriti* of infants.

Key words: Vital signs, infants, *Prakriti*, *Vata*, *Pitta*, *Kapha*

INTRODUCTION

Prakriti (psychosomatic constitution), which is very specific to every individual, is responsible for health or disease pattern in an individual. According Ayurveda¹, *Prakriti* is a formed by relative

contribution of *Pitta Vata*, and *Kapha* which is known as *Tridosha*², it is determined by genetically, with influenced to diet pattern and life style of mother, environment, and *Kala- Garbhashaya*³.

In Ayurveda seven types Prakriti described among them *Pitta, Vata, Kapha* is single and 3 *Dwandaja Prakriti Pitta-Vata, Kapha-Vata, kapha-Pitta and tridoshh Pitta-Vata-Kapha*, among single *Prakriti* known as extreme and more prone to disease⁴.

Recently many studies carried out related to the important parameters of *Prakriti* viz., genetic, molecular, biochemical and anthropometry parameters etc.⁵⁻¹³ in adults but very less study were carried out in children's or infants¹⁴⁻¹⁹. The present study described to association between vital signs and *Prakriti* in healthy an infants. In this study most common vital signs heart rate, respiratory rate and temperature¹ were assessed in infants.

Recently in 2017 *Srivastava N. et. al.*²⁰ have studied the relation between *Prakriti* & vital sign (Heart rate, Respiratory rate, Temperature and Oxygen saturation) in healthy children's and shows that the higher temperature and heart rate of baby may belong to *Pitta* and *Kapha* characteristics, *Pittaja Prakriti* have *Ushnamukha* and *Ushnasharira*, while *Kaphaja Prakriti* childrens have *Alpa Santapa* (low temperature) and shows that of *Kapha* resulting low heart rate while increased temperature along with high heart rate occurs in *Pittaja Prakriti*.

MATERIAL AND METHOD

1. Selection of Patients:

Total 96 healthy FT (AGA) infants were registered at 4th day of life and examined on subsequent follow ups at 3rd, 6th, 9th and 12th month, after considering following inclusion and exclusion criteria.

Inclusion Criteria: The FT (AGA), healthy newborn babies, who were delivered by uncomplicated SVD and elective lower segment cesarean section (LSCS) without showing any sign of fetal distress with Infants, whose parents have given written informed consent for the participation in the study, were only considered for the study

Exclusion Criteria: Preterm, post term or full term (SGA/LGA) baby at registration,

Any associated congenital anomalies at registration with Infant who was suffering with any disease at registration or any life threatening disorder observed on subsequent follow ups and Whose parents were not willing to participate in the study, were excluded from the study

2. **Prakriti assessment of infant.** *Prakriti* assessment in every infant was done thru a predesigned software i.e. PRS-IPA²¹ (Prototype Research Software-Infant Prakriti Assessment)

3. Assessment of vital signs in infants.

The temperature, heart rate (HR) and respiratory rate (RR) were assessed by inspection/ palpation method and manually. The data of each infant was recorded on infant assessment Performa and categorized on Microsoft excel 2010 after that final statistical analysis was done by SPSS 20.

Statistical analysis of data:

(IBM SPSS) Statistics software version 22.0 was used for statistical analysis of data. As per *Prakriti* of infants, vital signs data were categorized through statistical analysis. The result of statistical analyses data is written as mean \pm standard deviation of mean (Min – Max), One Way ANOVA test, and Post-Hoc pairs (Bonferroni tests) was applied to find out the significant relation between two *Prakriti*.

OBSERVATION AND RESULTS

1. Distribution of infants into different *Prakriti* groups at registration and on subsequent follow-ups based on the result of *Prakriti* deciding subjective parameters through PRS-IPA software.

Distribution of infants (n=96) into different *Prakriti* groups was done after calculating *Prakriti* at registration, and on subsequent follow-ups by PRS-IPA software (table number-01), and six type of *Prakriti* was observed except *Sama* i.e. *Tridoshaja Prakriti*.

Table No. 01: Distribution of infants into different Prakriti groups after calculating Prakriti at registration and on subsequent follow ups by PRS-IPA software.

(n= 96)	At registration, 3-month, 6-month, 9-month and 12 months					
	Vata	Pitta	Kapha	Kapha-Pitta	Vata-Kapha	Vata-Pitta
	10 (10.42%)	28 (29.12%)	18 (18.76%)	10 (10.42%)	13 (13.54%)	17 (17.74%)

2. Association between Vita Signs of infants with different Prakriti at registration, 3rd, 6th, 9th and 12th month-

➤ Temperature

Table No. 02: Showing association between Temperature (⁰C) of infants with different Prakriti at registration, 3rd, 6th, 9th and 12th month-

Prakriti (n=96)	Temperature (⁰ C)				
	Mean ± SD (Min- Max)				
	Registration	3month (FU1)	6month (FU2)	9 th month (FU3)	12 month (FU4)
1.Vata (n=10)	36.60±0.01 (36.20–37.00)	36.82±0.16 (36.60–37.20)	36.82±0.24 (36.50–37.60)	36.87±0.22 (36.41–37.40)	36.92±0.22 (36.60–37.40)
2.Pitta (n=28)	36.71±0.06 (37.0–37.0)	37.03±0.31 (36.80–37.90)	36.88±0.12 (36.70–37.10)	37.00±0.14 (36.70–37.20)	37.11±0.11 (36.90–37.20)
3.Kapha (n=18)	36.68±0.08 (37.00–37.00)	36.93±0.06 (36.80–37.00)	37.02±0.13 (36.70–37.30)	37.10±0.12 (36.90–37.40)	37.15±0.11 (37.00–37.50)
4. Kapha pitta (n=10)	36.72±0.18 (36.00–37.00)	37.50±0.55 (36.80–37.70)	37.10±0.44 (36.40–37.80)	36.97±0.28 (36.60–37.60)	37.01±0.38 (36.50–37.90)
5. Vatapitta (n=17)	36.66±0.08 (37.00–37.00)	37.13±0.08 (37.00–37.20)	37.27±0.09 (37.20–37.40)	37.33±0.12 (37.10–37.40)	37.43±0.07 (37.20–37.50)
6.Vata Kapha (n=13)	36.65±0.08 (37.00–37.00)	37.08±0.25 (37.10–37.1)	36.92±0.08 (36.80–37.10)	37.06±0.18 (37.70–37.30)	37.10±0.17 (36.80–37.30)
One Way ANOVA (Between Prakriti comparison)	F=4.296 P=0.001	F=2.953 P=0.016	F=12.321 P=0.000	F=15.519 P=0.000	F=17.673 P=0.000
Post Hoc test Significant pairs Bonferroni test (<0.05)	V vs. P (0.025) P vs. K (0.050) P vs. KP (0.005)	V vs.KP (0.097) P vs.KP (0.021) K vs.KP (0.037) VP vs. KP (0.021) KP vs. VP (0.021)	V vs. VP (0.000) P vs. K (0.033) P vs. KP (0.009) P vs. VP (0.000) K Vs. P (0.033) K vs. VP (0.007) VP vs. VK (0.000)	V vs. VP (0.000) P vs. K (0.002) P vs. VP (0.000) P vs. VK (0.052) K Vs. P (0.002) K Vs. VP (0.002) VP vs. VK (0.001) VP vs. VK (0.000) KP vs. VP (0.000)	V vs. VP (0.000) P vs. K (0.003) P vs. VP (0.000) K vs. VP (0.000) VP Vs. KP (0.000) VK Vs. VP (0.000)

Among Vata Prakriti infants, minimum mean temperature was observed at registration and on subsequent follow ups while maximum mean temperature was seen at registration in Pitta Prakriti, FU1 in Kapha Pitta, FU2, FU3 and FU4 in Vata Pitta Prakriti.

One way ANOVA test and Post Hoc Bonferroni test shows significant variation (p <0.001) at registration and subsequent follows ups. (Table No. 02).

➤ Heart rate:

Variation in heart rate of infants of different Prakriti can be seen from table No. 03 which was found maximum among Vata prakriti while minimum in infant of Kapha Pitta Prakriti at registration, FU1, FU2, FU3, while on fourth follow ups minimum heart rate was found among Vata Kapha Prakriti infant.

Table No. 03: Showing association between heart rate/minute of infants with different *Prakriti* at registration, 3rd, 6th, 9th and 12th month of age-

<i>Prakriti</i> (n=96)	Heart Rate (per/minute)				
	Mean + SD (Min- Max)				
	Registration	3 rd month (FU1)	6 th month (FU2)	9 th month (FU3)	12 th month (FU4)
1. <i>Vata</i> (n=10)	137.80±4.75 (132-146)	125.40±2.83 (122-132)	124.20±2.89 (120-130)	122.80±2.69 (120-128)	120.80±3.19 (118-128)
2. <i>Pitta</i> (n=28)	137.39±6.01 (130-150)	125.14±3.02 (120-132)	124.25±4.00 (116-136)	121.64±3.52 (118-130)	120.14±2.87 (114-128)
3. <i>Kapha</i> (n=18)	137.0±4.86 (132-146)	124.88±2.08 (122-128)	122.77±1.95 (120-126)	121.66±2.14 (120-127)	120.05±3.74 (116-127)
4. <i>Kapha</i> <i>Pitta</i> (n=10)	133.90±3.21 (130-140)	121.40±1.68 (120-124)	121.20±1.68 (120-124)	120.00±2.5 (115-122)	120.00±2.30 (118-124)
5. <i>Vata</i> <i>Pitta</i> (n=17)	137.61±5.20 (130-150)	124.85±3.43 (120-130)	122.66±3.24 (118-130)	121.90±2.99 (118-128)	119.50±2.35 (160-126)
6. <i>Vata</i> <i>Kapha</i> (n=13)	137.53±4.70 (130-144)	124.61±34.51 (121-128)	122.92±2.25 (120-126)	121.69±2.42 (118-126)	120.23±3.21 (118-130)
One Way ANOVA (Between <i>Prakriti</i> comparison)	F=1.179 P=0.325	F=3.429 P=0.007	F=2.110 P=0.071	F=1.507 P=0.195	F=0.432 P=0.825
Post Hoc test Significant pairs Bonferroni test (p<0.05)	-	V vs. KP (0.095) P vs. KP (0.006) K vs. KP (0.021) VP vs. KP (0.016)	P vs. KP (0.089)	-	-

➤ **Respiratory rate/minute**

Table No. 04: Showing association between respiratory rate/minute of infants with different *Prakriti* at registration, 3rd, 6th, 9th and 12th month -

<i>Prakriti</i> (n=96)	Respiratory rate (per minute)				
	Mean + SD (Min- Max)				
	Registration	3month (FU1)	6month (FU2)	9month (FU3)	12 month (FU4)
1. <i>Vata</i> (n=10)	42.70±6.49 (30-44)	40.70±3.71 (32-44)	40.40±2.45 (36-44)	40±1.88 (38-44)	37.60±1.83 (36-40)
2. <i>Pitta</i> (n=28)	40.71±4.14 (32-50)	38.00±0.56 (32-44)	37.50±3.59 (28-44)	37.51±3.90 (30-42)	36.17±4.69 (28-42)
3. <i>Kapha</i> (n=18)	41.66±3.71 (38-52)	34.44±0.18 (30-40)	34.66 ±3.56 (30-42)	33.44±4.69 (28-40)	32.00±3.53 (28-40)
4. <i>Kapha- pitta</i> (n=10)	40.90±2.68 (36-46)	34.20±3.18 (30-40)	33.00±2.53 (30-38)	32.80±3.29 (28-40)	31.60±3.23 (28-36)
5. <i>Vata- pitta</i> (n=17)	41.33±4.60 (32-52)	33.04±4.08 (26-40)	31.04±4.17 (22-38)	29.80±4.28 (22-38)	29.10±3.00 (24-36)
6. <i>Vata - Kapha</i> (n=13)	41.23±1.30 (40-44)	32.76±10.15 (26-40)	32.92±3.01 (28-38)	32.46±3.38 (26-40)	30.92±4.29 (24-40)
One Way ANOVA (Between <i>Prakriti</i> comparison)	F=0.394 P=0.852	F=7.269 P=0.000	F=14.760 P=0.000	F=14.936 P=0.000	F=12.485 P=0.000
Post Hoc test Significant pairs Bonferroni test (p<0.05)	-	V vs. VP (0.042) V vs. VK (0.068) V vs. KP (0.000) P vs. KP (0.000) K Vs. KP (0.020) KP vs. VP (0.086)	V vs. K (0.0001) V vs. VP (0.000) V vs. VK (0.000) V vs. KP (0.001) P vs. K (0.010) P Vs. VP (0.000) P vs. KP (0.003) P vs. VP (0.018) K vs. VP (0.067)	V vs. K (0.0001) V vs. VP (0.000) V vs. VK (0.000) V vs. KP (0.000) P Vs. VP (0.001) P vs. VK (0.025) P vs. KP (0.010) P vs. VP (0.025)	V vs. K (0.05) V vs. VP (0.000) V vs. VK (0.001) V vs. KP (0.009)

At registration, minimum mean respiratory rate was observed among *Pitta Prakriti* infants while on FU1 minimum respiratory rate was observed among *Vata Kapha Prakriti* infants and at FU2, FU3, FU4 it was in *Vata Pitta Prakriti* infants.

Among the *Vata Prakriti* infants, maximum mean respiratory rate was observed at registration and on subsequent follow ups.

One way ANOVA test showed significant variation found on subsequent follow ups except registration. ($p < 0.001$).

On applying Post Hoc Bonferroni Test, significant pairs were observed almost in all the pairs on subsequent follow ups except at registration. (Table Number -04).

DISCUSSION AND CONCLUSION

In longitudinal study, $n=96$ healthy FT (AGA) infants, irrespective to sex were registered on 4th day of life, and they were examined five times at registration and on subsequent follow ups.

Distribution of all infants ($n=96$) into different *Prakriti* groups has been done after calculating *Prakriti* at registration, and on subsequent follow-ups by PRS-IPA software and suggest six type of *Prakriti* except *Sama* i.e. *Tridoshaja Prakriti* viz. *Vata* ($n=10$), *Pitta* ($n=28$), *Kapha* ($n=18$), *Kapha-Pitta* ($n=10$), *Vata-Kapha* ($n=13$), *Vata-Pitta* ($n=17$) in which maximum infants belonged to *Pitta Prakriti* (29.12%) followed by *Kapha Prakriti* (18.76%) and *Vata-Pitta Prakriti* (17.74%).

The mean temperature of *Vata* and *Pitta Prakriti* has shown statistically significant variation in all follow-ups. However the *Vata Prakriti* infants has shown minimum mean temperature during the study period, while maximum mean temperature has been seen at registration in *Pitta Prakriti*, FU1 in *Kapha Pitta*, FU2, FU3 and FU 4 in *Vata Pitta Prakriti*. (table number-02)

In case of single *Prakriti* infants, significant and consistent decline in respirator rate was observe in infants of *Kapha Prakriti*, *Kapha-Pitta*, *Vata-Ptita* and

Vata-Kapha, while infants of *Vata Prakriti* shows relatively less decline Respiratory Rate during the first 9 months. The mean respiratory rate at birth has shown higher in *Vata Prakriti* than infants of other types of *Prakriti* at registration and was sustained till final follow ups (table number-04).

In previous study done by *Srivastava N et. al.* (2019) who had shown also the similar result for vital parameters²⁰.

CONCLUSION

The present study exemplifies the association of vital and prakriti of infants, which is in conformity with textual references in Ayurveda. For example, the higher temperature and heart rate of baby may belong to *Pitta* and *Kapha* characteristics, *pitta Prakriti* have *Ushnamukha* and *Ushnasharira*, while *Kaphaja Prakriti* infants have *Alpa Santapa* (low temperature) and shows that of *Kapha* resulting low heart rate while increased temperature along with high heart rate occurs in *Pitta Prakriti* and the ayurvedic physician has a good correlation with PRS-IPA measurements, thereby providing an effective and quantitative instrument to assess the *prakriti* of infants. And this study also suggests the importance of interrogating the important concepts and procedures of Ayurveda by the tools of contemporary science, which may yield new knowledge of value in the modern practice of medicine.

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