The Pharma Innovation

Srivastava Kumar Niraj
Associate Professor, Department
of Kaumarbhritya, Bal-Roga,
Government Ayurvedic PG
College & Hospital,
Sampurnanand Sanskrit
University, Varanasi,
Uttar Pradesh, India

Gehlot Sangeeta
Professor and Head, Department
of Kriya-Sharir, FOAY, IMS,
BHU, Varanasi, Uttar Pradesh,
India

Singh BM
Professor and Head, Department
of Kaumarbhritya, Bal-Roga,
FOAY, IMS, BHU, Varanasi,
Uttar Pradesh, India

Relationship between *KALA* (Season) at conception, *KALA* (Season) at delivery and age of mother with Prakriti of infants (Cross-sectional study)

Srivastava Kumar Niraj, Gehlot Sangeeta and Singh BM

Abstract
Background: *Prakriti* is one of the distinctive and elementary concepts of *Ayurveda* that explain the uniqueness, which is decided at the time of conception and later nurtured during the intrauterine life. There are so many aspects that influence the *Prakriti* of an infant; *Kala- Garbhasaya Prakriti* (season at conception) is one of them.
Material and Methods: *Prakriti* of 226 infants was assessed thru PRS-IPA (Prototype Research Software-Infant *Prakriti* Assessment), while *Kala* (season) at conception of mother, *Kala* (season) at delivery of mother, time at delivery of mother and age of mother at the time of delivery were gathered by demographical data of research case sheet.
Observation and Result: Total 226 infants were registered on the basis of inclusion and exclusion criteria of study after proper screening and consent. *Prakriti* of registered infants was assessed by software IPS-PRA and its relation was explored in relation to *Kala* (season) at conception of mother, *Kala* (season) at delivery of mother, time at delivery of mother and age of mother at the time of delivery.
Discussion and Conclusion: Variation in incidence of infant's *Prakriti* in relation to season at the time of conception may be attributed to other factors which play important contributory role in deciding the individual's final *Prakriti*. *Acharya Charak, Sushruta* and *Vagbhata* have described that *Vata, Pitta and Kapha Prakopa* takes place in *Varsha*, *Sharad and Basanta Ritu*. This study showed more percentage of *Kaphaja* and *Pittaja Prakriti* of infants when mother conceive in *Basanta* and *Sharada Ritu*. This validated the concept of *Ayurveda* because *Basanta Ritu* is period of *Kapha Prakop* and *Sharada Ritu* is period of *Pitta Prakop*.

Keywords: Prakriti, Ritu, Kala, Season, Dosha

Introduction
Every man and women on the earth born with some or other physical and mental peculiarities which will remain with him or her through the life. Such features which required by birth itself are called *Prakriti*. These specific types of *Doshika Prakriti* can be identified in growing individuals [1].The knowledge about the *Prakriti* is helpful in diagnosis of diseases [2], management of disease [3] and forecast of *Dosha* dependent disorders in future [4]. Knowledge of *Prakriti* can guide the parents for prevention of expected disorders and deciding career of their wards at a very early age [5].

Formation of *Deha Prakriti*
Acharya Charaka has described these factors influencing the *Prakriti* determination as [6] –
1. *Sukra-Shonita Prakriti* (Characteristics of sperm and ova)
2. *Kala-Garbhasaya Prakriti* (Time factor and condition of uterus)
3. *Maturaharavihara Prakriti* (Diet and code of conduct of mother)
4. *Panchamahabhuta-vikara Prakriti* (Condition of *Panchamahabhuta-vikara*).

Acharya Sushruta [7] emphasizes mainly on the genetic factors such as
1. Status and *Dosha* of sperm
2. Status and *Dosha* of ovum are responsible for formation of *Prakriti* (Constitution)

Apart from the above mentioned factors, *Acharya Charaka* [8] describes some other factors for *Prakriti* determination such as
1. *Jati-Prasakta* (Racial/ Caste)
2. *Kula-Prasakta*(Familial)

Correspondence
Srivastava Kumar Niraj
Associate Professor, Department
of Kaumarbhritya, Bal-Roga,
Government Ayurvedic PG
College & Hospital,
Sampurnanand Sanskrit
University, Varanasi,
Uttar Pradesh, India

3. *Desh-anupatinee* (Country)
4. *Vayo-nupatinee* (Natural change according to age)
5. *Kala-nupatini* (Time)
6. *Pratyatmaniyata* (Individual specific character)

Vagbhata [9] has added seventh as strength (*Bala*) in this list. The present study was planned to find out the relationship of *Kala* (season) at conception, *Kala* (season) at delivery, time at delivery *and* mother's age at the time of delivery on infants' *Prakriti*.

Material and Methods
Selection of patients
This cross-sectional study was completed on *Kaumarbhritya/ Balroga*, O.P.D., Sir Sunderlal (S.S) Hospital, Institute of medical sciences (I.M.S), Banaras Hindu University (B.H.U) after obtaining approval from the institutional ethics committee. Written informed consent was taken before include the infant in study. Assessment of infants *Prakriti* was done on 10th day of life thru PRS-IPA (Prototype Research Software-Infant *Prakriti* Assessment). Infants were selected on following inclusion criteria and exclusion following inclusion criteria and exclusion Criteria-

Inclusion criteria
1. If attendant give written consent for the participation in the study,
2. Full term and appropriate gestational age [FT (AGA)]
3. Infants who delivered by uncomplicated SVD (spontaneous vaginal delivery) or LSCS (lower segment Cesarean section) without showing any sign of fetal distress.

Exclusion criteria
1. If attendant was not willing for the participation.
2. Preterm, post term or full term [Small Gestational age (SGA)/ Large gestational age (LGA)] baby.
3. If congenital anomalies associated at registration.
4. If suffering from any life-threatening disease.

Ethical clearance
The ethical committee clearance number is dean/2011-12/392-A dated on 12/12/2011.

Assessment of *Prakriti*
For this study, a questionnaire of software was prepared on the basis of *Prakriti* characteristic described in different textbooks of *Ayurveda viz. Charaka Samhita* [10], *Sushruta Samhita* [11], *Ashtanga Samgraha* [12], *Ashtanga Hridya* [13], *Bhava Prakash* [14], *Sharangadhar Samhita* [15], *Harita Samhita* [16] and *Bhela Samhita* [17]. Characteristic related to the infants was mainly taken for questionnaire in this software while the others characteristics related to the adults were not considered.

Assessment was done by *Darshan* (Inspection), *Sparshana* (Palpation) and *Prasana* (questionnaire) *Pariksha* (examination) [18, 19]. Scores of *Vata*, *Pitta* and *Kapha* in an infant was scored by using a 0/1 against V/P/K for each of the questions depending on a no or yes answer respectively and cumulative scores of V, P and K are calculated in each individual through the software [20].

In this cross sectional study a significant relationship appear between *Prakriti* of Infant and *Kala* (season) at conception of mother, *Kala* (season) at delivery of mother, time at delivery of mother, and age of mother at the time of delivery. *Kala* is important factor which influences *Prakiti* determination. *Ayurveda* has given great importance to the *Kala* (time) for the *Swastha* (healthy) as well as the *Roga* (disease). According to *Acharya Charaka*, *Kala* have been divided into *Uttarayana* and *Dakshinayana*. *Uttarayana* or *Adana Kala* composed by *Sishir, Basanta, Greesma* and *Dakshinayana* or *Visarga Kala* is composed by *Varsha, Sharad, Hemanta*. *Tridoshas* when get affected by external forces as *Kala* (season), it also reflects upon the corresponding *Doshaja* or genetic *Prakriti* [21]. *Sanchay* (Accumulation of *Dosha*), *Prakop* (Aggravation of *Dosha*) and *Prasara* (Rehabilation of *Dosha*) dependent *on Kala* (Season). Contribution of season on the infant's *Prakriti* was assessed on the basis of expected month of conception which was calculated by the LMP and history from mother.

Table 1: Effect of *Ritukala* on *Tridoshas*

Dosha	*anchaya*	*Prakopa*	*Prashara*
Vata	*Grishma*	*Varsha*	*Sharad*
Pitta	*Varsha*	*Sharad*	*Hemant*
Kapha	*Shishira*	*Basanta*	*Grisma*

Table 2: *Doshic* Rhythms in Different (*Kala*) Seasons

Season(*Kala*)	English month	*Sanchaya*	*Prako a*	*Prasha a*
Sishir	January - February	*Kapha*	… … …	*Pitta*
Basant	March – April	*Kapha*	… … … … … .	… … … ..
Grisma	May - June	… … … … … .	*Kapha*	… … … … .....
Varsha	July – August	*Vata*	*Pitta*	*Kapha*
Sharad	September- October	*Pitta*	*Vata*	*Kapha*
Hemant	November- December	*Pitta*	*Vata*	*Vata*

Table 3: *Doshic* Rhythms in the day and night

Day/Night	Time	Time (AM/PM)	*Sanchaya*	*Prakopa*	*Prashara*
Day	Morning	6.00 AM to 10.00 AM	*Pitta*	*Kapha*	*Vata*
	Noon	10.00 PM to 2.00 PM	*Vata*	*Pitta*	*Kapha*
	Afternoon	2.00 PM to 6.00 PM	*Kapha*	*Vata*	*Pitta*
Night	Evening	6.00 to 10.00 PM	*Pitta*	*Kapha*	*Vata*
	Midnight	10.00 to 2.00 AM	*Vata*	*Pitta*	*Kapha*
	Early morning	2.00 to 6.00 AM	*Kapha*	*Vata*	*Pitta*

Observation and Result

Total 226 infants were registered on the basis of inclusion and exclusion criteria of study after proper screening as per predesigned proforma. *Prakriti* of infants was assessed by software IPS-PRA and its relation was explored to *Kala* (season) at conception of mother, *Kala* (season) at delivery of mother, time at delivery of mother and age of mother at the time of delivery.

Table 4: Relation between *Kala* / Season of Conception (SOC) with incidence of infants *Prakriti*

Season of conception (SOC)	*Prakriti* of infants (Total n=226)					
	Vata (n=5)	*Pitta* (n=27)	*Kapha* (n=31)	*Vata-Pitta* (n=48)	*Vata-Kapha* (n=53)	*Pitta-Kapha* (n=62)
Sishir	0 (0.0%)	2 (4.35%)	3 (6.52%)	11 (23.91%)	11 (23.91%)	19 (41.30%)
Basant	0 (0.0%)	4 (8.33%)	9 (18.75%)	9 (18.75%)	11 (22.92%)	15 (31.25%)
Grisma	2 (13.33%)	1 (6.67%)	1 (6.67%)	2 (13.33%)	4 (26.66%)	5 (33.33%)
Varsha	1 (5%)	4 (20%)	5 (25%)	5 (25%)	3 (15%)	2 (10%)
Sharad	1 (1.26%)	13(16.46%)	10 (12.66%)	18 (22.78%)	20 (25.32%)	17 (21.51%)
Hemant	1 (5.55%)	3 (16.67%)	3 (16.67%)	3 (16.67%)	4 (22.22%)	4 (22.22%)

This table reveals that the maximum mothers conceived in season of *Sharad* (*35%*) while minimum in season of *Grisma* (*6.6%*). Maximum infants whose mother conceived in *Sishira* belonged to *Pitta-Kapha Prakrti* (41.30%).

The mothers who conceived in *Sharad* their infants were of *Pitta Prakriti* (16.46.1%). Further details can be seen from Table No 4.
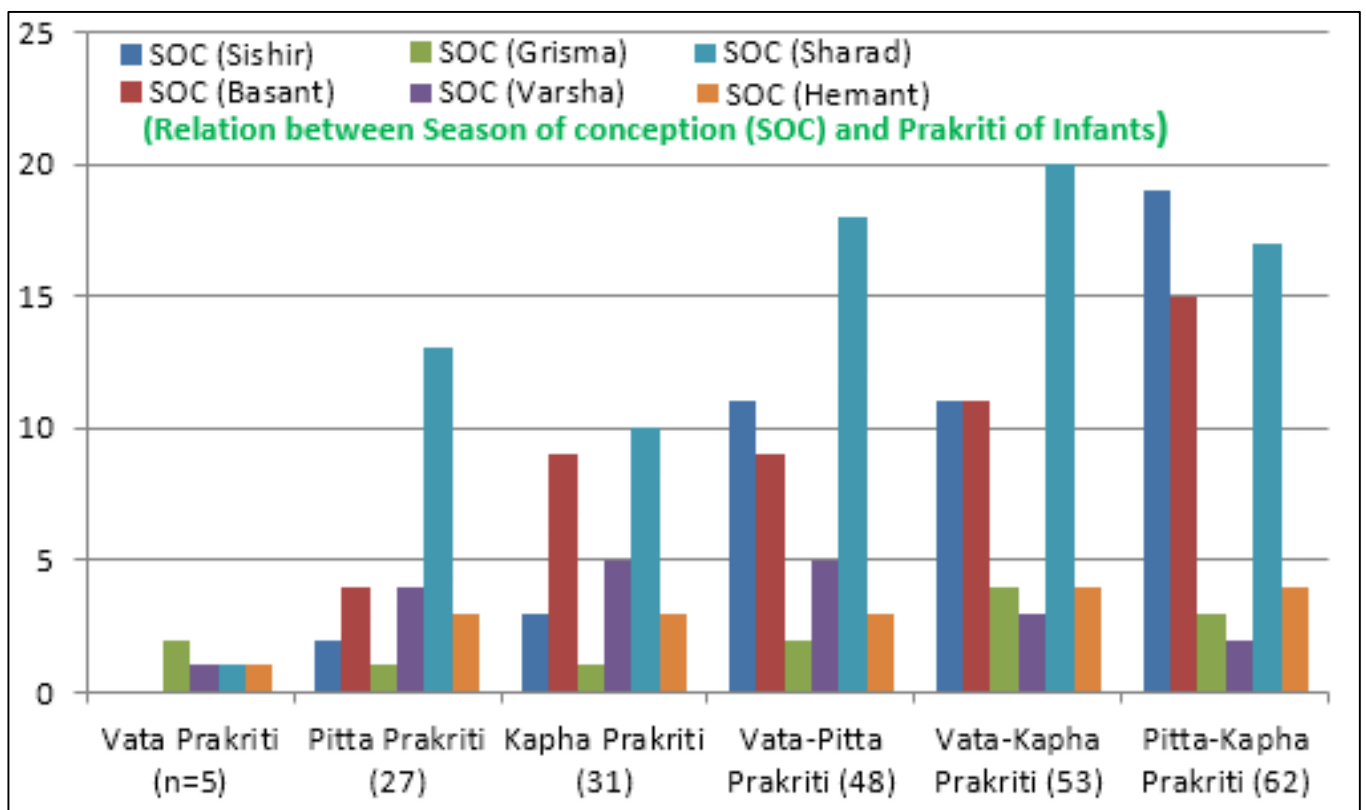

Fig 1: Relation between season of conception (SOC) and Prakriti of Infants

Table 5: Relation between Seasons of delivery (SOD) with incidence of infants *Prakriti*

Season of delivery (SOD)	*Prakriti* of Infants Total (n=226)					
	Vata (n=5)	*Pitta* (n=27)	*Kapha* (n=31)	*Vata-Pitta* (n=48)	*Vata-Kapha* (n=53)	*Pitta-Kapha* (n=62)
Sishir	0 (0.0%)	3 (6.81%)	8(18.18%)	8 (18.18%)	11 (25.00%)	14 (31.81%)
Basant	2 (11.11%)	2 (11.11%)	3 (16.67%)	4 (22.22%)	3 (16.67%)	4 (22.22%)
Grisma	2 (5.28%)	8 (21.05%)	6 (15.78%)	9 (23.68%)	7 (18.42%)	6 (15.78%)
Varsha	1 (1.38%)	11(15.27%)	9(12.50%)	15 (20.83%)	19 (26.38%)	17 (23.61%)
Sarad	0 (0.0%)	1 (5.56%)	0 (0.0%)	5 (27.78%)	4 (22.22%)	8 (44.44%)
Hemant	0 (0.0%)	2 (5.55%)	5(13.88%)	7 (19.44%)	9 (25.00%)	13 (36.11%)

This table shows that overall incidence of infants born in *Varsha* was maximum (31.9%) while it was minimum in 8% in *Sharad*. Further details can be seen from Table No 5.
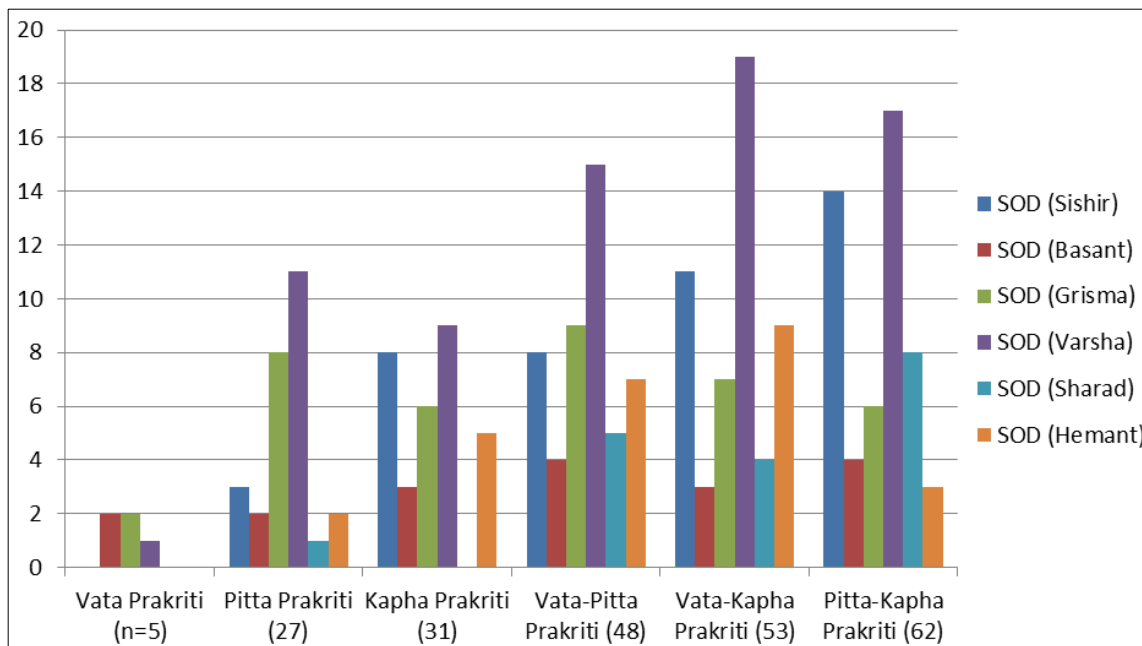
Fig 2: Relation between Season of delivery (SOD) and Prakriti of Infants

Table 6: Relation between Time of Delivery (TOD) with incidence of infants *Prakriti*

(Time of delivery)	*Prakriti* of Infants					
	Vata (n=5)	*Pitta* (n=27)	*Kapha*(n=31)	*Vata-Pitta*(n=48)	*VataKapha*(n=53)	*PittaKapha*(n=62)
Group 1 (~2.00 AM to ~6.00 AM) (*Vata Prakop*)	0 (0.0%)	4 (20%)	3 (15%)	6 (30%)	3 (15%)	4 (20%)
Group 2 (~6.00 AM to ~10.00 AM) (*Kapha Prakop*)	1(2.85%)	6 (17.14%)	5(14.28%)	4 (11.42%)	9 (25.71%)	10 (28.57%)
Group 3 (~10.00 AM to ~2.00 PM) (*Pitta Prakop*)	2 (3.07%)	5 (7.69%)	8(12.30%)	14(21.53%)	17 (26.15%)	19 (29.23%)
Group 4 (~2.00 PM to ~6.00 PM) (*Vata Prakop*)	1 (3.57%)	3 (10.71%)	2 (7.14%)	8 (28.57%)	5 (17.85%)	9 (32.14 %)
Group 5 (~6.00 PM to ~10.00 PM) (*Kapha Prakop*)	0 (0.0%)	4 (12.50%)	5(15.62%)	6 (18.75%)	8 (25%)	9 (28.12%)
Group 6 (~10.00 PM to ~2.00 AM) (*Pitta Prakop*)	1 (2.17%)	5 (10.86%)	8(17.39%)	10(21.73%)	11 (23.91%)	11 (23.91%)

Maximum (28.8%) infants were born during 10.00 AM to 2.00 PM and minim infants (8.8%) were born during 2.00 AM- 6.00 AM. Further details can be seen from Table No 6.
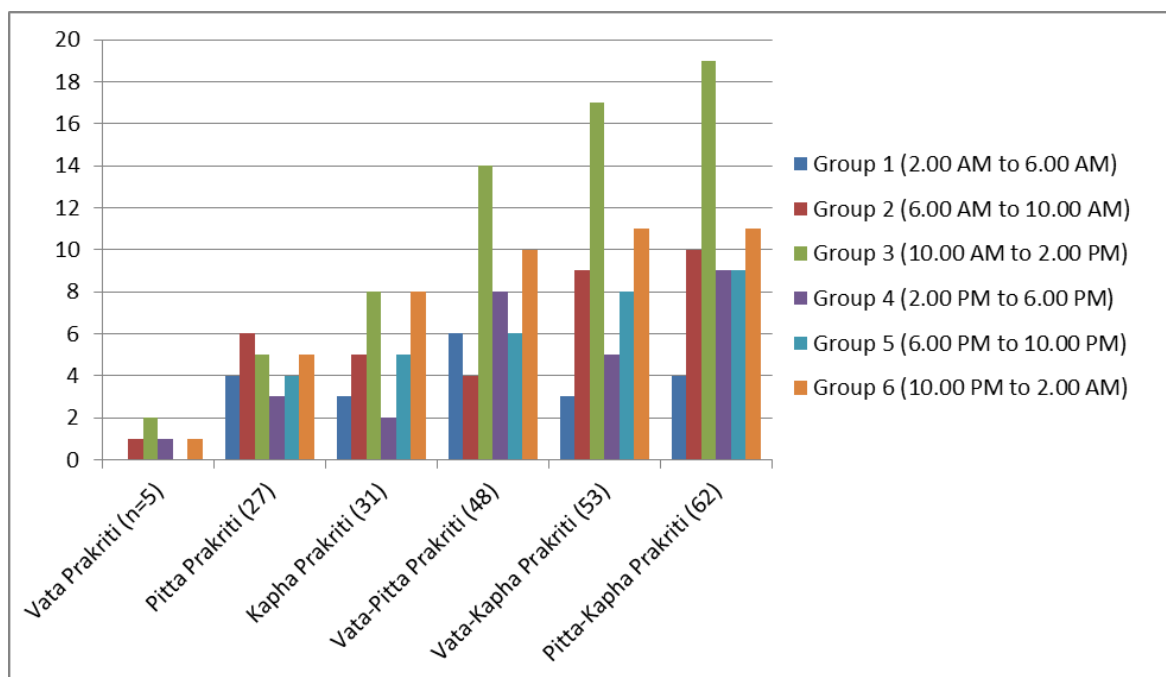

Fig 3: Relation between Time of delivery (TOD) and Prakriti of Infants.

Table 7: Relationship between Mother age group with incidence of infants *Prakriti*

Mother Age group (Years)	*Prakriti* of infants					
	Vata (n=5)	*Pitta* (n=27)	*Kapha* (n=31)	*Vata-Pitta* (n=48)	*Vata-Kapha* (n=53)	*Pitta-Kapha* (n=62)
Group 1 (20-24 yrs)	0(0.0%)	8 (29.6%)	10 (32.3%)	18 (37.5%)	10 (18.9%)	23 (37.1%)
Group 2 (25-28 yrs)	3(60.0%)	12 (44.4%)	13(41.9%)	15(31.2%)	27 (50.9%)	23 (37.1%)
Group 3 (29-32 yrs)	2(40.0%)	5 (18.5%)	3 (9.7%)	13 (27.1%)	10 (18.9%)	12 (19.4%)
Group 4 (>32 yrs)	0(0.0%)	2 (7.4%)	5 (16.1%)	2 (4.2%)	6 (11.3%)	4 (6.5%)

This table reveals that among 20-24 years 37.5% and 37.1% infants were of *Vata-Pitta* and *Pitta-Kapha Prakriti*. Among 25-28 years maximum infants (50.9%) belonged to *Vata Kapha Prakriti*. Further details can be seen from Table No 7.
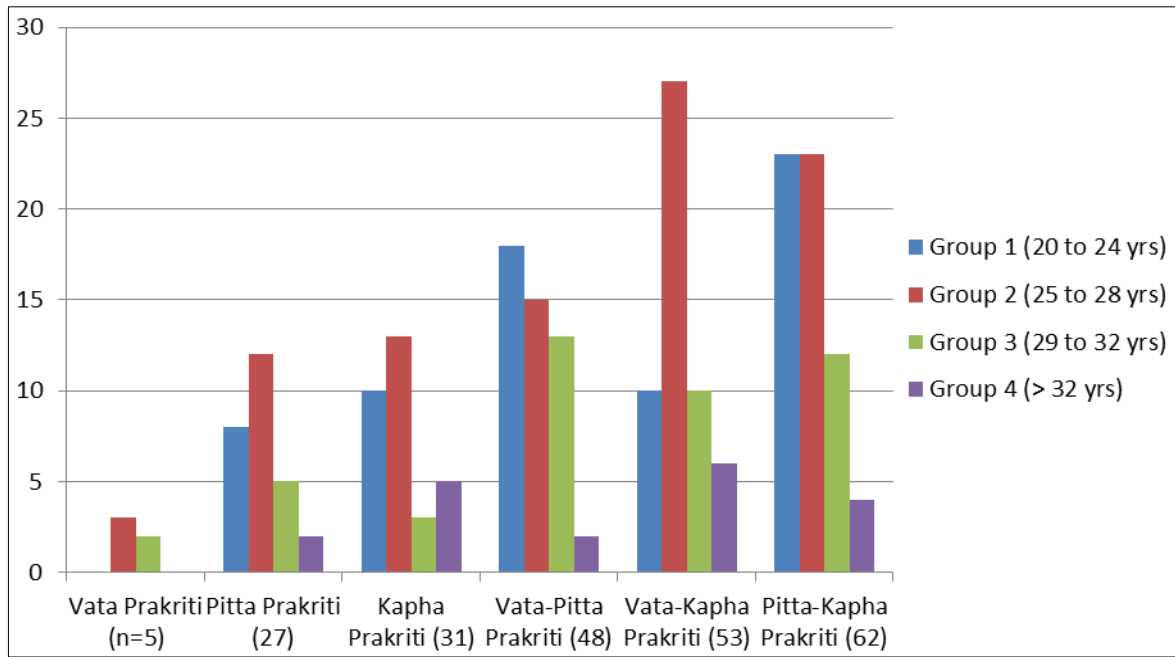

Fig 4: Relation between Mother age group and Prakriti of Infants

Discussion

Ayurveda is an ancient system of personalized medicine documented and practiced in India since 1500 B.C. *Prakriti* (genetic constitution) is basic genetic constitution of the body. *Ayurveda* describes seven broad constitution types of *Prakriti*. *Acharya Charaka* has described four factors influencing the *Prakriti* determination is *Sukra-Shonita Prakriti* (Characteristics of sperm and ova), *Kala-Garbhasaya Prakriti* (Time factor and condition of uterus), *Maturaharavihara Prakriti* (Diet and code of conduct of mother) and *Panchamahabhuta-vikara Prakriti* (Condition of *Panchamahabhuta-vikara*) [22]. The *Kala* (season) has specific impact on *Dosha* predominant during formation of *Prakriti* (genetic constitution). Different *Prakriti* (genetic constitution) of individuals shows diverse reactions towards six *Kala* (season) [23]. *Prakriti* influenced by various factors, out of which time of conception is one of the important factors. *Acharya Charak* [24], *Sushruta* [25] and *Vagbhata* [26] have described that *Vata, Pitta* and *Kapha Prakopa* takes place in *Varsha*, *Sharad* and *Basanta Ritu*.

In present study, a contribution of season on the infant's *Prakriti* was assessed on the basis of expected date of conception which was calculated by the LMP and history from mother.

The data of observation revealed that more percentage *Kaphaja* and *Pitta Prakriti* of infants when mother conceive in *Basanta* and *Sharada Ritu*. This validated the concept of *Ayurveda* because *Basanta Ritu* is period of *Kapha Prakop* and *Sharada Ritu* is period of *Pitta Prakop*. *Vata-Pitta*

Prakriti was born to mothers who had been conceived in *Basanta Ritu*, a *Kapha* aggravating season. However, this trend was not seen in children of *Vata Prakriti* this may be due to less sample size and other contributory factors in respect to *Prakriti*. A study carried out during 1972 to 1990, by Anand K *et al*. 1999, has shown incidence of maximum delivery in month of July to September (35%), while in the present study it is 31.9%, which is in conformity with earlier workers. High incidence of delivery/birth of infants in *Varsha Ritu* is due to aggravation of *Vata Dosha* in mother, who had conceived during the *Sharad Ritu* because *Vata* also affects the mother particularly the uterus in turns the fetus.

Relation between the time of delivery and incidence of infants *Prakriti* was observed. In Ayurveda, no reference is available in regard to effect of season at the time of birth. *Acharya Vagbhata* has described about rhythmic variation as per the predominance of *Dosha* [27] during the course of a day i.e. in twenty four hours. On the basis of data it may be inferred that diurnal variation i.e. *Dosha* dominance at the time of delivery in mother has no role in deciding infant's *Prakriti*. At the time of conception if mother age group is 25-28 yrs then maximum chance of infants *Prakriti* was *Pitta, Kapha* and *Vata-Kapha*. If mother age group is 20-24 yrs then maximum chance of infants *Prakriti* was *Kapha*, *Vata-Pitta* and *Pitta-Kapha*.

Conclusion

Variation in incidence of infant's *Prakriti* in relation to season at the time of conception may be attributed to other factors

which play important contributory role in deciding the individual's final *Prakriti.* This variation seems to be the effect of other factors like *Sukra-Shonit Prakriti, Matura-Ahara Prakriti* and *Panchmahabhuta-vikara Prakriti* and had contributed at the time of conception and during in-utero growth and development of embryo and fetus. *Acharya Charak, Sushruta* and *Vagbhata* have described that *Vata, Pitta and Kapha Prakopa* takes place in *Varsha, Sharad and Basanta Ritu.* This study showed more percentage of *Kaphaja* and *Pittaja Prakriti* of infants when mother conceive in *Basanta* and *Sharada Ritu.* This validated the concept of *Ayurveda* because *Basanta Ritu* is period of *Kapha Prakop* and *Sharada Ritu* is period of *Pitta Prakop.*

Source of support: Nil
Conflict of interest: None Declared

References

1. Agnivesha. Charaka Samhita, English translation by Sharma RK, Dash B. Viman-Sthan, Chaukhambha Sanskrit series office, Varanasi. 2010; 2:8-95.
2. Agnivesha. Charaka samhita English translation by Sharma RK, Dash B. Viman-Sthan Chaukhambha Sanskrit series office, Varanasi. 2010; 2:6-16.
3. Agnivesha. Charaka samhita, English translation by Sharma RK, Dash B. Sutra-Sthan, Chaukhambha Sanskrit series office, Varanasi. 2010; 1:10-11.
4. Vagbhata Astanga Hriday. English translation by Srikantha Murty KR, Sutra sthana, Chaukhambha, Krishnadas Academy Varanasi. 2015; 1:1-10.
5. Srivastava Niraj, Singh Praguna, Gehlot Sangeeta, Singh Sanjay, Singh BM. Basics for the development of prototype research software relevant to infants' Prakriti assessment for Vikriti management and possible future disorders. Int. J Res. Ayurveda Pharm, 2017, 8(1).
6. Agnivesha, Charaka samhita. English translation by Sharma RK, Dash B. Viman-Sthan Chaukhambha Sanskrit series office, Varanasi. 2010; 1:8-95.
7. Sushruta. Sushruta samhita, English translation by Sharma P.V, Sharir-sthan Chaukhambha Vishvabharati, Varanasi. 2005; 2(4):63.
8. Agnivesha, Charaka samhita. English translation by Sharma RK, Dash B. Indriya Sthan, Chaukhambha Sanskrit series office, Varanasi. 2010; 2:1-5.
9. Vagbhata, Astanga Samgraha. English translation by SrikanthaMurty KR, Sharir-sthana, Chaukhambha Orientalia, Varanasi. 2001; 2:8-22.
10. Agnivesha, Charaka Samhita. English translation by Sharma RK, Dash B. VimanSthan, Chaukhambha Sanskrit series office, Varanasi. 2010; 2(8):96-100.
11. Sushruta. Sushruta samhita, English translation by Sharma PV, Sharir-sthan Chaukhambha Vishvabharati, Varanasi. 2005; 2(4):64-76.
12. Vagbhata. Astanga Samgraha. English translation by Srikantha Murty KR, Sharirsthana, Chaukhambha Orientalia, Varanasi. 2001; 2(8):6-14.
13. Vagbhata, Astanga Hridaya. English translation by SrikanthaMurty KR, Sharirsthana Chaukhambha, Krishnadas Academy Varanasi. 2015; 1(3):85-103.
14. Bhavmishra. Bhav Prakasha, commentary and English translation by SitaramBalusu, Chunekar KC Purvakhanda Chaukhambha Orientalia, Varanasi. 2006; 1(4):54-58.
15. Sharangadharacarya. Sharngadhara samhita English translation by Rao G. Prabhakar, 1st edition, Purvakhanda Chaukhambha Sanskrit sansthan, Varanasi. 2013; 6:21-23.
16. Harita. Harita samhita English translation by Pandey Gyanendra, Pratham-sthana Chaukhambha Sanskrit series office, Varanasi. 2016; 1(5):17-22.
17. Bhela, Bhela samhita. English translation by Krishnamurty KH, Viman-sthana Chaukhambha Vishvabharati, Varanasi. Reprint year. 2008; 4:16-25,
18. Sushruta. Sushruta samhita, English translation by Sharma P., Sutra-sthan Chaukhambha Vishvabharati, Varanasi. 2005; 1:10-4.
19. Vagbhata. Astanga samgraha, English translation by Srikantha Murty KR, Sutra sthana, Chaukhambha Orientalia, Varanasi, 2001, 1(1).
20. Srivastava N, Gehlot S, Singh S, Singh BM. Do the anthropometric parameters vary as per Prakriti (Physical constitution) of Infants; International Journal of Innovative Knowledge Concepts, 2017, 5(12).
21. Agnivesha. Charaka samhita, English translation by Sharma RK, Dash B. Viman Sthan Chaukhambha Sanskrit series office, Varanasi. 2010; 2(8):76.
22. Agnivesha. Charaka samhita, English translation by Sharma RK, Dash B. Viman Sthan Chaukhambha Sanskrit series office, Varanasi. 2010; 1(8):95.
23. Bakal Nilesh Ganeshrao, Lode Dattatraya Somaji, Patil Aparna Shrikrishna. Ritu (Season), Ritucharya and Prakriti- A Conceptual Study. Int. J Ayur. Pharma Research. 2014; 2(2):101-110.
24. Agnivesha. Charaka samhita, English translation by Sharma RK, Dash B. Sutra Sthan Chaukhambha Sanskrit series office, Varanasi. 2010; 1(17):114.
25. Sushruta. Sushruta samhita, English translation by Sharma P.V, Sutra-sthan, Chaukhambha Vishvabharati, Varanasi. 2005; 1(6)12-13.
26. Vagbhata. Astanga samgraha, English translation by Srikantha Murty KR, Sutra sthana, Chaukhambha Orientalia, Varanasi. 2001 1(21):9.