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CRITICAL STUDY OF CONCEPT OF KALA (TIME) IN AYURVED AND JYOTISH SCIENCE AND ITS INFLUENCE ON HEALTH & DISEASE

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Abstract: The Jyotish science is complimentary and contemporary to the Ayurvedic medical science. The principles of Jyotish science have been applied in Ayurvedic science at various places. Time is one such important concept which influences both the science. The Kala is divided into minute divisions like *Gati*, *pala* to broad divisions like day and night, months and years. The *Sthula Kala* [broad timings] is decided on the basis of sunrise and sunset, similarly the *sukshma Kala* [minute timings] is decided on the basis of time required to pronounce the one word or to close the eye (*Nimesha*). The critical review of Ayurvedic and Jyotishiya literature shows that the concept of division of Kala in Jyotish science is utilized by Ayurvedic science, for deciding the diurnal (*Ahoratra*), seasonal (*Ritu Anusar*) aggravation and alleviation of Doshas. Similarly this concept has also been utilized to decide the strength offered by the seasons (*Ritu Bala and Ayan bala*). Also this concept of *Kala* is utilized in Ayurvedic science to administer the specific *doshahar* purifying therapies like *Vamana* (emesis) in *Vasanta ritu*, *Virechana* (purgation) and *Raktamokshana* (blood letting) in *Sharda ritu* (autumn) and *Basti* (enema) in *Varsha ritu* (rainy season). Similarly it is also used to administer special drugs for special purposes like '*Punsanvahan Vidhi*' (Sex change therapy).

Keywords: Kala, Nava (acute), Jirna (chronic), doshaprakopa (aggravation of doshas), dosha shamana (alleviation of doshas).

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INTRODUCTION:

The concept of time is important in disease treatment also for e.g. the shodhana (bio purification) should be given in Jwara after 3 weeks (trisaptahe Vyatite Jware). Similarly in surgery also concept of time is used. For.e.g. Raktaj Gulma (hematometra) is removed surgically after nine months. The time divides any disease into acute and chronic stage and treatment varies as per the stage. Jwara become Niram (non toxic) in a week time. In Aama (toxic) stage of Jwara (fever) Langhana (fasting) is employed as therapeutic measure. The concept of Kala is also utilized to decide the prognosis of the disease also. For e.g. the Ardit and Pakshaghata (facial palsy and hemiplegia) of above 3 years is incurable. The Vatarakta (gout) of more than 1 year is also incurable. The concept of Kala is also utilized in collection and storage of the drug for its maximum efficacy.

The critical comparison of Ayurvedic and Jyotish shastrokta, Kala concept showed marked similarities. It is concluded that the concept of Kala is important in deciding the doshik aggravation, physical strength, staging the disease, treating the disease, in deciding the prognosis of the disease and in deciding the collection and storage of the drugs.

MATERIAL & METHOD

Literary method of research was adopted in the present study. Critical and comparative study of Ayurvedic literature and Jyotish science literature was done to come to logical conclusion.

REVIEW OF LITERATURE**Review of Ayurvedic Literature****Definition of Kala**

As per acharya Sushruta, the unit which does not stop even for a while is a 'Kala' (time).^[1]

Division of Kala As per Ayurveda

As per acharya Sushruta, the movement of sun divides the time into many divisions like *Nimesh, Kashtha, Kala, Muhurta, Ahoratra, Paksha, Masa, Ritu, Ayana, Sanwatsara/varsha, Yuga and Mahayuga*.^[2]

Nimesh [0.30 seconds]

As per *acharya* Sushruta, the time required to pronounce the smallest word is 'Nimesha'.^[3]

Kashtha [4.5 seconds]

As per acharya Sushruta, the 15 such Nimeshas constitute 1 Kashtha.^[3]

Kala [135 seconds or 2.25 minutes]

As per *acharya* Sushruta, 30 Such Kashthas constitute 1 Kala.^[3]

Muhurta [45 minutes]

As per *acharya* Sushruta, 20 Kala constitute 1 Muhurta.^[3]

Ahoratra/ [Day & Night] [1350 minutes or 22.5 hours]

As per *acharya* Sushruta, 30 Muhurtas constitute 1 Ahoratra (day & Night).^[3]

Paksha [Fortnight]

As per *acharya* Sushruta, 15 Ahoratras constitute 1 Paksha (There are 2 Pakshas – Shukla & Krushna).^[3]

Masa [Month]

As per *acharya* Sushruta, 2 Paksha constitute 1 Masa (There are total 12 masas).^[3]

Ritu [Season]

As per *acharya* Sushruta, 2 Masa constitute 1 Ritu. The *Bhadrapada* and *Ashwin* months constitute *Warsha ritu* (Rainy season), The *Kartika* and *Margashirsha* months constitute *Sharad ritu* (Autumn season), *Pausha* and *Magha* months constitute *Hemant ritu* (Winter season), *Falgun* and *Chaitra* months constitute *Vasanta ritu* (Spring season),

Vaishakh and *Jyeshtha* months constitute *Greeshma ritu* (Summer season), *Aashadh* and *Shrawan* months constitute *Pravrut ritu* (Pre-monsoon season).^[4]

Ayana [Solstice]

As per acharya Sushruta, 6 *Ritus* constitute 1 *Ayana*. There are 2 such *Ayanas* (solstice) which divides the year into two halves such as *Uttarayana* and *Dakshinayana*. The 3 *ritus* *Shishir*, *Vasanta* and *Greeshma* represents *Uttarayana* (northern solstice) whereas other 3 *ritus* such as *Varsha*, *Sharada* and *Hemanta* represents *Dakshinayana* (Southern solstice).^[5]

Sanwatsara [Year]

As per acharya Sushruta, 2 *Ayana* constitute 1 *Sanwatsara* (Year).^[5]

Yuga [Era]

5 *Sanwatsaras* constitute 1 *Yuga*.^[5]

As per acharya Kashyapa

Kala samuha is referred as *Kala*.^[6]

Types

A] 1. *Shubha/ Utsarpini* (Auspicious time), 2. *Ashubha / Avasarpini* (Inauspicious time)

B] 1. *Bhuta* (Past), 2. *Vartaman* (Present), *Bhavishya/Anagata* (Future)

C] *Utsarpini kala* [Progressive time] is further divided into :

1. *Aadiyuga* [Evolutionary Era], 2. *Devayuga* [Era of Gods], 3. *Krutayuga* [Kruta Era]

Avasarpini [Regressive time] is further divided into :

1. *Tretayuga* [Treta Era], 2. *Dwaparyuga* [Dwapar Era], 3. *Kaliyuga* [Kali Era]

Interrelationship of Graha-Rashi & Ritu [Planets & Seasons]

As per acharya Sharangdhara and Bhavamishra, When sun is in Aries and Taurus

(*Mesha, Vrushabha*), there is *Greeshma ritu* (summer). When sun is in Gemini and Cancer (*Mithun, Karaka*), there is *Pravrut ritu*. When sun is in Leo and Virgo (*Sinha, Kanya*), there is *Warsha ritu* (Rainy season). When sun is in Libra and Scorpio (*Tula, Vrushik*), there is *Sharad ritu* (Autumn). When sun is in Sagittarius and Capricorn (*Dhanu, Makara*), there is *Hemant ritu* (winter). When sun is in Aquarius and Pices (*Kumbha, Meena*), there is *Vasanta ritu* (Spring).^{[7][8]}

Kala and Aggravation of Doshas

There is accumulation of Vata in *greeshma* (summer) and aggravation in *Varsha* (rainy season) and natural alleviation in *Sharada* (autumn). There is accumulation of Pitta in *Varsha ritu*, aggravation in *Sharad ritu* and natural alleviation in *Hemant ritu* (winter season). Similarly there is accumulation of Kapha in *Hemant ritu*, aggravation in *Vasanta ritu* (Spring season) and alleviation (*shamana*) in *Greeshma ritu* (Summer).^[9]

Kala and Doshik Bio Purification

There is aggravation of Vata in *Varsha*. Hence, it should be cleaned with *Basti* (enema) in *Varsha ritu* (rainy season). There is aggravation of Pitta in *Sharad ritu* (autumn) hence, it should be cleaned with *virechana* (purgation) therapy in *Sharada ritu*. Similarly there is aggravation of Kapha in *Vasanta* (spring), hence, it should be cleaned out of the body in *Vasanta ritu* through *Vamana* (emesis) therapy.^[10]

Ayana and Bala

In *Dakshinayana* (southern solstice) there is increase in *Amla* (sour), *Madhura* (sweet), *Lavana* (salty) *rasas* in the environment and the vegetables. Hence, this period promotes

the health of the peoples. In *Uttarayana* (northern solstice), there is increase in *Tikta* (bitter), *Kashaya* (astringent), *Katu* (Acrid) *rasas* in the environment and the vegetables. Hence, this period demotes the health of the peoples.^[11]

Kala -Bio-Clock & Doshas

As per acharya Vagbhata, during the onset, middle and end of the day, meal and age there is predominance of Kapha, Pitta and Vata respectively.^[12]

Kala As Aetiological Factor

The common aetiological factors for both psycho somatic doshas are - *Asatmya Indriyatha Samyoga* (over, low and perverted use of sensory organs), *Pragya-apradha* (Indiscretion) and *Parinam* (Effects of time/age/season).^[13]

Kala & Classification of Diseases

The *Kalabala Pravrutta* disease refers to the diseases due to the ill effects of seasonal cold, heat, rain, wind etc. They are further classified as :

1. ***Vyapanna Ritu Kruta/ AKalaj (Untimely diseases)*** – Diseases due to change in nature of the season (*ritu vyapat*) such as hotness in winter and cold in summer.
2. ***A- Vyapanna Ritu Kruta/ kalaj (Timely diseases)*** – Diseases due to natural accumulation and aggravation (*sanchay and prakopa*) of the doshas in respective seasons.^[14]

Review of Jyotish Literature

Definition of Kala

As per ancient astrological book Surya siddhanta, the one which passes and can be counted is a Kala and it is of two types – broad and minute.^[15]

Division of Kala (Kala Chakra As per Jyotish Science)

The movement of sun divides the time into constituent parts such as *Kala*, *Kashtha*, *Muhurta*, *Dina*, *Ratri*, *Paksha*, *Masa*, *Ritu*, *Varsha*, *Yuga*, *Kalpa*.^[16]

Nimesha

The time required to puncture the lotus petal by needle is called as 'Truti' The 100 such Truti constitute 1 Lava. And 30 such lava constitute 1 Nimesha.^[17]

Kala

The 18 such Nimesha constitutes 1 Kashtha. The 30 Kashthas constitute 1 Kala.^[17]

Tithi

As per Surya siddhanta, the 12^o movement of lunar from sun is called as 1 Tithi.^[18]

Paksha [Half of Month]

As per Surya siddhanta, the half period of the month is called as 1 Paksha.^[18]

Chandra Masa [Lunar Month]

The 30 Tithis constitute 1 Chandra Month. .^[18]

Ritu [Season]

As per astrological book Surya siddhanta, the total of two months constitute 1 Ritu.^[19]

Ayana [Solstice]

As per astrological book Surya siddhanta, the time of 6 months from *Makar sankrata* is called as 'Uttar Ayana' (northern solstice) whereas the period of 6 months from *Karka Sankranti* is called as ' Dakshin Ayana' (southern solstice).^[19]

Sanwatasara [Year]

As per astrological book Surya siddhanta, the total 12 months constitute 1 year.^[20]

As per Sidhhanta Shiromanikar Bhaskaracharya

As per the author Bhaskaracharya of Siddhanta Shiromani book,

1 *Tatpar* constitute 100 *Truti*, 300 *Truti* constitute 1 *Nimesha*, 18 *Nimesha* constitute 1 *Kashtha*

30 *Kashtha* constitute 1 *Kala*, 30 *Kala* constitute 1 *Ghati/Nadi*, 2 *Ghati* constitute 1 *Muhurta*.^[21]

As per Rajmartandakar Bhoja

As per author King Bhoja of text Rajmartanda, 18 *Nimesh* constitute 1 *Kashtha*, 30 *Kashtha* constitute 1 *Kala*, 30 *Kala* constitute 12 *muhurtas*

1 day night is *Ahoratra*, 15 *Ahoratra* constitutes 1 *Paksha*, 2 *Paksha* is 1 month, 30 *Ahoratra* constitute 1 month, 12 month constitute 1 Year.

Movement of Surya gives rise to four Yugas.

Kali Yuga [Kali Era] consists of 432000 years

Dwapar Yuga is $432000 \times 2 = 864000$ years

Treta Yuga is $432000 \times 3 = 1296000$ years

Kruta Yuga is $432000 \times 4 = 1728000$ years

1000 *Mahayuga* of Devas = 1 *Bramha Kalpa*

71 *Mahayuga* constitute 1 *Divya Manwantara*.^[22]

As per Aryabhata

Utsarpini kala [Progressive time] contains half portion (*mahayugardha*) of total 6 yugas i.e. 1. Aadi-yuga, 2. Deva-yuga, 3. Kruta-yuga and *Avasarpini kala* contains rest half portion i.e. 4. Treta-yuga, 5. Dwapar-yuga, 6. Kali-yuga. In *Utsarpini kala* there is increase in lifespan, strength and vigour of peoples whereas in *Avasarpini kala* [Regressive time], there is decline in lifespan, strength and vigour of peoples. In middle *yugas* (eras) there is balance between inclination and decline.^[23]

Relationship between the Planets and the Ritus

As per acharya Parashara, the planet Venus (*shukra*) rules the *Vasanta* (spring) ritu. *Surya* (sun) and *Mangal* (mars) rules the *Greeshma ritu* (summer). The planet *Chandra* (moon) rules the *Varsha ritu* (rainy season) whereas planet *Budha* (mercury) rules the *Sharada* (Autumn) ritu. *Shani* (Saturn) rules over the *Shishira* and *Hemanta* ritu.^[24]

OBSERVATIONS

Table No. 1

Time Criteria	Ayurveda Terminology	Time Criteria	Jyotish Terminology
Time required to pronounce the smallest word	1 <i>Nimesha</i>	Time required to puncture lotus petal by needle is called as 'Truti. 100 such Truti constitute 1 Lava. 30 lava is 1 nimesha	1 <i>Nimesha</i>
15 <i>Nimesha</i>	1 <i>Kashtha</i>	18 <i>Nimesha</i>	1 <i>Kashtha</i>
30 <i>Kashthas</i>	1 <i>Kala</i>	30 <i>Kashtha</i>	1 <i>Kala</i>
20 <i>Kala</i>	1 <i>Muhurta</i>	30 <i>Kala</i>	1 <i>Ghati</i>

		2 Ghati	1 Muhurta
		60 Ghati	1 Ahoratra
30 Muhurtas	1 Ahoratra	30 Muhurtas	1 Ahoratra
15 Ahoratra	1 Paksha	15 Ahoratra	1 Paksha (15 Tithis)
2 Paksha	1 Masa (Month)	2 Paksha (30 Tithis)	1 Masa (Month)
2 Masa	1 Ritu	2 Masa	1 Ritu
6 Ritu	1 Ayan	6 Ritu	1 Ayan
2 Ayan	1 Sanvatsara (Year)	2 Ayan	1 Sanvatsara (Year)

Table No. 2 - Interrelationship of Graha-Rashi & Ritu

Sr.	Sun in Zodiacs	Seasons
1	Aries and Taurus (Mesha , Vrushabha)	Greeshma ritu (summer)
2	Gemini and Cancer (Mithun , Karaka)	Pravrut ritu (Pre rainy season)
3	Leo and Virgo (Sinha , Kanya)	Warsha ritu (Rainy season)
4	Libra and Scorpio (Tula, Vrushik)	Sharad ritu (Autumn)
5	Sagittarius and Capricorn (Dhanu , Makara)	Hemant ritu (winter)
6	Aquarius and Pices (Kumbha , Meena)	Vasanta ritu (Spring)

Table No. 3 - Kalachakra (Time Circle) & Health Impact

Mas (Months)	Approximation with Gregorion calendar	Ritus (Seasons)	Ayan (Solstice)	Sanvatsar (Year)
Magha (Tapa)	20 January - 20 February	Shishir (Late winter)	Uttarayana (Northern Solstice)	Aadan-kala (Demotion of Health)
Falgun (Tapasya)	20 February - 20 March			
Chaitra (Madhu)	20 March - 20 April	Vasant (Spring)		
Vaishakh (Madhav)	20 April - 20 May			
Jyeshtha (Shuchi)	20 May - 20 June	Greeshma (Summer)		
Aashadh (Shukra)	20 June - 20 July			
Shrawan (Nabha)	20 July - 20 August	Varsha (Rainy)	Dakshinayana (Southern Solstice)	Visarga-Kala (Promotion of Health)
Bhadrapad (Nabhtsya)	20 August - 20 September			
Ashwin (Esha)	20 September-20 October	Sharada (Autumn)		
Kartik (Urja)	20 October-20 November			
Margashirsha (Saha)	20 November-20 December	Hemanta (Early winter)		
Paush (Sahasya)	20 December - 20 January			

Table No. 4 - Relationship Between Ritus and Rashi Lords

Ritu Lord	Surya & Mangal	Chandra	Budha	Shani	Shukra	Guru
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Ritus	Greeshma	Warsha	Sharada	Hemanta	Vasanta	Sishir
Mas (Months)	Jyeshtha Aashadh	Shrawan Bhadra- pad	Ashwin Kartik	Margashir Paush	Chaitra Vaishakh	Magh Falgun

Table No. 5 - Clinical Application of Time Concept For Doshik Pathogenesis & Treatment

Dosha ↓	Sanchaya		Prakopa		Prasham		Dosha Shodhan
	Mas	Ritu	Mas	Ritu	Mas	Ritu	
Vata	Jyeshtha Aashadh	Greeshma	Shrawan Bhadra- pad	Varsha (Chandra)	Ashwin Kartik	Sharada	Basti (Enema) in Warsha
Pitta	Shrawan Bhadrapad	Varsha	Ashwin Kartik	Sharada	Marga- shira & Paush	Hemanta	Virechana (Purgation) in Sharada
Kapha	Margashir Paush	Hemanta	Chaitra Vaishakh	Vasanta	Jyeshtha Aashadh	Greeshma	Vamana (Emesis) in Vasanta

Table No. 6 - Diurnal Variation of Doshik Predominance As Per Time

Dosha	Age (Vaya)	Meal (Bhojan)	Day (Dina)	Night (Ratri)
Kapha	Bala (Paeds to Children 1 to 20)	Soon after the intake of food	Morning (5 am to 12pm) Early Morning – 5 am to 8 am Late morning – 11am to 12 pm	Evening (7 pm to 9 pm) Late evening – 7 pm to 9 pm Night – 9 pm to 4 am
Pitta	Young (20 to 60)	During the digestion of food	Afternoon (12 pm to 5 pm) Early afternoon – 1 to 3 pm Late afternoon – 4 to 5 pm	Midnight (12 am to 4 am) Early Midnight – 12 to 2 am Late midnight – 2 to 4 am
Vata	Old (Vruddha) > 60 Yr	After the digestion of food	Evening (5 pm to 9 pm) Early evening 5 pm to 7 pm	Dawn (4 am to 6 am)

DISCUSSION

Although there is mostly a similarity between Ayurvedic and *Jyotishiya Kalaganana* (astrological time measurement), there is little difference in some of the aspects. As per Ayurveda 15 *Nimesha* is equal to 1 *Kashtha*, as per *Jyotisha* 18 *Nimesha* constitute 1 *Kashtha*. As far as *Kala* is concerned, both science agree

that 30 *Kashtha* makes 1 *Kala*. **Sushrutacharya** and Rajmartand author **Bhojraj** are of same opinion in most of the calculations. As per **Bhaskaracharya**, 1 *Tatpar* constitute 100 *Truti*, 300 *Truti* constitute 1 *Nimesha*, 18 *Nimesha* constitute 1 *Kashtha*, 30 *Kashtha* constitute 1 *Kala*, 30 *Kala* constitute 1 *Ghati/Nadi*, 2 *Ghati* constitute 1

Muhurta/Kshana. Later calculations are same as given by **Sushrutacharya**. As per **Bhaskaracharya**, The 12^o movement of moon from sun is called as 1 *Tithi*, The 30 *Tithis* constitute 1 *Chandra Mas* (Lunar Month). Later calculations are same as given by **Sushrutacharya**. The time of 6 months from *Makar sankrata* is called as ‘Uttar Ayana’ (northern solstice) whereas the period of 6 months from *Karka Sankranti* is called as ‘Dakshin Ayan’(southern solstice).

As per **acharya Vagbhata**, during the onset, middle and end of the day, meal and age there is predominance of Kapha, Pitta and Vata respectively. This is the bioclock mentioned in Ayurveda. As per *sushrutacharya*, there is accumulation of Vata in *Greeshma* and aggravation in *Varsha* and natural alleviation in *Sharada ritu*. There is accumulation of Pitta in *Varsha ritu*, aggravation in *Sharad ritu* and natural alleviation in *Hemant ritu*. Similarly there is accumulation of Kapha in *Hemant ritu*, aggravation in *Vasanta ritu* and alleviation (shaman) in *Greeshma ritu*. The ideal purification therapy for Vata, Pitta and Kapha are *Basti*, *Virchana* and *Vamana* respectively to be performed in *Varsha*, *Sharada* and *Vasanta ritu* respectively. In *Dakshinayana* there is increase in *Amla* (sour), *Madhura* (sweet), *Lavana* (salty) *rasas* in the environment and the vegetables. Hence, this period promotes the health of the peoples. In *Uttarayana*, there is increase in *Tikta* (bitter), *Kashaya* (astringent), *Katu* (Acrid) *rasas* in the environment and the vegetables. Hence, this period demotes the health of the peoples. **Acharya Sharangdhara and Bhavprakasha** have given the division of *Ritus* (seasons) on

the basis of movement of sun through different zodiacs (*Rashis*). As per **Charkacharya**, Kala also represent one of the important general cause of diseases among the famous triad along with *Asatmya Indriyatha Sanyoga* and *Pragyapradha*.

Similarly, there are different types of *Visham Jwara* (Irregular fever) on the basis of Kala such as *Santata jwara* (continuous fever), *Satataka jwara* (Intermittent fever), *Anyedyushka jwara* (Quotodian fever), *Trutiyaka jwara* (Tertian fever) and *Chaturthaka Jwara* (Quartan fever) depending upon the time and interval of days in which they occur.

RESULTS

1. The concept of Kala is well documented in Ayurvedic and Jyotish Science and is based on solar transition through various zodiac signs.
2. Ayurveda had not only utilized the concept of Kala in setting the bio-clock but also in setting the treatment protocol as per the aggravation of doshas.
3. There is aggravation of Vata at the end of the digestion of food, at the end of the day and evening and during old age.
4. There is aggravation of Pitta in the middle of the digestion of food, at the middle of the day and night and during young age.
5. There is aggravation of Kapha at the beginning of the digestion of food, at the beginning of the day and night and during the child age.
6. There is accumulation of Vata in *Greeshma ritu*, Pitta in *Varsha Ritu*, Kapha in *Hemanta Ritu*.
7. There is aggravation of Vata in *Varsha ritu*, Pitta in *Sharad Ritu*, Kapha in *Vasanta Ritu*.

8. There is alleviation of Vata in Sharada ritu, Pitta in Hemanta Ritu, Kapha in Greeshma.
9. The ideal purification therapy for Vata, Pitta and Kapha are Basti, Virchana and Vamana respectively.
10. *Basti* (enema), *Virchana* (purgation) and *Vamana* (emesis) should preferably be performed in *Varsha ritu* (rainy season), *Sharada ritu* (autumn season) and *Vasanta ritu* (Spring season) respectively for complete purification of the body.

CONCLUSIONS

1. The concept of Kala is well documented in Ayurvedic and Jyotish Science and is based on solar transition through various zodiac signs.
2. The Concept of Kala is used in Ayurvedic science to determine the accumulation, aggravation and alleviation of morbid doshas.
3. The Concept of Kala is used in Ayurvedic science to classify the diseases as *Akalaj* (Untimely diseases) and *Kalaj* (Timely diseases) and also used in classifying the *visham-jwaras* (irregular fevers) on the basis of time interval at which the fever spike occurs.
4. Kala is one of the Pradhan hetu of the diseases among famous triad of *Asatmya Indriyarthasanyoga* (Incompatible contacts of senses), *Pragyapradha* (Intellectual transgression) and *Parinama* (Time).
5. The Concept of Kala is used in Ayurvedic science to carry out the *shodhana* (bio purification) therapy.
6. The Concept of Kala is used in Ayurvedic science to determine the aggravation of doshas as per age, food, day and night.
7. Ayurveda had not only utilized the concept of Kala in setting the bio-clock but also in setting the treatment protocol as per the aggravation of doshas.

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