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ANALYTICAL STUDY OF PRAKRITI AND ITS REVIEW WITH THE DATA RELATED TO GENETICS

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ABSTRACT :

Prakriti presents a personalized approach in the predictive, preventive, and curative aspects of stratified medicine with molecular variability, which intersects mind and body. It includes the study of inter individual variability due to genetic variability in humans for assessing susceptibility, establishing diagnosis and prognosis, mainly on the basis of the constitution. *Prakriti* defined as unchangeable nature i.e. genotype, starting from fertilization where influence of later environmental factors exhibit phenotype natures. *Doshik(vata,pitta,kopha*) segregation by permutation and combination in intrauterine life produce *deha prakriti*. For psychological characters mental trait form 16 types of personalities in different individuals.

Acharya Charaka emphasized certain additional factors which determine the *Prakriti*- 1.Nature of the season. 2. Condition inside the uterus. 3. Food of mother and other regimens adopted by mother during pregnancy. 4. *Sukra-Sonita* of father and mother. 5. *Mahabhuta Vikara*. These factors get afflicted with one or more of the *Doshas* and thereby rendering susceptibility of *doshik* fluctuation that come in formation of different *Prakriti*. It also helps to know the nature of an individual expressed by phenotypes and genotypes. *Maturahara vihara Prakriti* i.e. mother's diet and regimen during pregnancy play significant influence in offspring's personality, health and disease. Present study is done analysing influencing factor of prakriti and data of previous research work about genetic with emphasis on the necessity of preconceptional counselling as per ayurvedic perspective to assist healthy progeny as well as prevention of congenital and genetic disorders i.e. "Pregnancy should be after proper analysis of the *prakriti"*.

Key words: *Prakriti*, Genetics, phenotype, Pre conceptional counselling.

INTRODUCTION: The Status of *dosha* in both spermatozoa and ovum during fertilization shows various permutation and combination in zygote and exhibit *prakriti which* indicate "natural inherited character". These genotypic characters are influenced by different factors. Environmental factors are also included in these regard. Thus phenotypic character will highlight specificity in individual. The study wants to analyze the prakriti influencing factor and review the previous research works about genetic and thus analysing preconceptional counselling on basis of *prakriti.*

AIM AND OBJECTIVES:

1. Analysis of the factors influencing *Prakriti.*
2. Preparation of a Preconceptional counselling module applying available materials.

MATERIALS AND METHODS:

1. *Prakriti* influencing factors are analysed from classics.

2. Congenital abnormalities occurring due to morbidity of *prakriti* influencing factors are assessed.
3. To prevent phenotypic disorders preconceptional counselling on basis of *prakriti* are discussed.
4. Preconceptional counselling steps are highlighted emphasising Ayurvedic aspect.

ANALYSIS: The physical, physiological, psychological characteristics of an individual i.e. prakriti in Ayurveda are fixed at the time of fertilization through permutation and combination of *dosha i.e. vata, pitta and kapha.* It is influenced by variety of factors. The factors influencing *Prakriti* are discussed as below:

Primary factors in formation of *prakriti:* These help in prakriti formation in embryo and remains unchangeable.1.*Sukra sonita prakriti* (Hereditary factors) 2.*Kala Garbhashaya prakriti* (Age and uterus condition) 3.*Matuahar vihar prakriti* (Maternal diet and regimen) 4.*Mahabhuta vikar prakriti* (Bio-transformed element)[1]

Post natal influencing factors: These influence in prakriti in various stages of life.1. *Jatiprasakta* (human race/religion)2. *Kulaprasakta* (caste/family)3. *Deshanupatini*(Environment or Place where lived) 4. *Kalaprasakta* (the season or time) 5.*Vayo-anupatini* (age or stages of life) 6.*Pratyatmaniyata* (basic instincts shows individuality) .These factors show their significance in clinical aspect.[2]

***1. Sukra sonita prakriti* (Hereditary factors):** Genetic inheritance is evident in morphological distribution identified as *matrija* and *pitrija.* Structures originating from *Pitrija bhava* (Paternal Source) as per ayurveda are *kesha, shmashru, loma* (hair of the head, face and body), *asthi (*bones), *nakha* (nail), *danta* (teeth), *sira* (vessels), *snayu* (tendons), *dhamani* (arteries), *retas* (semen) are inherited by paternal inheritance in an individual. Structures originating from *Matrija bhava* (maternal source) are *mamsa* (flesh), *sonita* (blood) *medo* (fat), *majja* (bone marrow), *hridaya* (heart), *nabhi* (umbilicus), *yakrit* (liver), *pleeha* (spleen), *antra* (intestine), *guda* (rectum) are inherited by maternal side. Concept of hereditary transmission has been given by description of Specific genetic material *i.e bija, bijabhaga and bijabhagavayava.* For example abnormality of the "part of *bija"* leads to deformity of the organ which originates from that particular region of *bija* only. Few abnormalities due to hereditary factors defects include *Vandhya* (infertility), *Trinaputrika* (deficiency of male characters), *Sandi and Suchi yoni vyapad.*

Studies related to hereditary disorder with respect to above factor show following data:

A. Data about the Incidence of sex chromosome abnormalities in newborns: [3]

Type of abnormality	Approx Incidence: male births	Type of abnormality	Approx Incidence: female births
47,XXY	1/1080	45,X	1/960
47,XYY	1/1080	47,XXX	1/960
Other	1/1350	Other	1/2740
Total	1/385	Total	1/660

B. Data about the incidence of both autosomal and sex chromosome abnormalities in newborns: [4]

Numerical abnormalities	in infants live births	Structural abnormalities	in infants live births
Trisomy 21(Down syndrome)	1/800	Balanced rearrangements Robertsonian	1/1120
Trisomy 18(Edwards syndrome)	1/8148	Others	1/965
Trisomy 13(Patau syndrome)	1/19000	Unbalanced rearrangements	1/1675
Triploidy	1/57000	Total	1 /395
Total	1/695		

2. *Kala- Garbhashaya prakriti:* **(**Age and uterus condition) - Kala indicate 1.Maternal and paternal age.2.Reproductive period. *Garbhasaya* indicate female reproductive system in general and uterus in particular. Acharya Susruta hypothesized about abnormality in early parenthood i.e. before 16 years for female and 25 years for male respectively. Copulation should be done in *anindaya kala* (unforbidden) for getting a child of healthy state.

Clinical variables affecting prakriti throughout the life are listed as below:

Variables	***KAPHA***	***PITTA***	***VATA***
Cycle of age	*Balya* (Childhood)	*Yuva* (Young)	*Vridha* (Old age)
Cycle of Time	*Purvahna*(Early morning)	*Madhyahna*(Midday/mid night)	*Aparahana* (Evening)
Cycle of seasons	*Sisir*(late winter)	*Sarad*(autumn)	*Varsh*a (Rainy)
Cycle of uterus	*Rituvyatia kala* (Proliferative phase)	*Ritu kala*(Ovulation Phase)	*Ritusrava kala*(Menstrual Phase)

Age-related changes in the uterus:[5] Functional capacity of the human uterus decreases with age of women for eg. there is increase in spontaneous abortions, placenta previa , dysfunctional labour , and uterine pathology, however the embryo is apparently chromosomally normal. The proportion of myometrial arteries containing sclerotic lesions increase with age i.e. 11% at age 17-19, 37% at 20–29, 61% at age 30–39, and 83% after age 39. Increase in obstetrical complication in older women such as placental abruption, caesarean delivery, operative vaginal delivery and mal presentation. Age-related changes in ovulation and hormone secretion is also seen ,Other physiological factors contributing to the age-related decline in fertility include decrease in ovarian sensitivity to gonadotrophin.[5]

Maternal age related genetic abnormality observed in different studies as below:

A. Maternal age related frequency of aneuploid foetuses detected prenatally:[3] The Rates of trisomies , Human Genetics, Modified from Schreinemachers et al. (1982) noted aneuploid rate per 1000 in maternal age range 35–49 years was observed as follow-

Aneuploid rate per	Trisomy21	Trisomy18	Trisomy13	XXX	XXY	XYY
1000	9.1	2.5	0.6	1.0	1.3	0.5

B. Data about the Maternal age and chromosome abnormalities detected at amniocentesis:[6] Rate per 1000

Age	Trisomy21	Trisomy18	Trisomy13	XXX	XXY	All chromosome
35	3.9	0.5	0.2	0.6	0.5	8.7
36	5.0	0.7	0.3	0.7	0.6	10.1
37	6.4	1.0	0.4	0.7	0.8	12.2
38	8.1	1.4	0.5	0.8	1.1	14.8
39	10.4	2.0	0.8	1.2	1.4	18.4
40	13.3	2.8	1.1	1.5	1.8	23.0
41	16.9	3. 9	1.5	1.8	2.4	29.0
42	21.6	5.5	2.1	2.4	3.1	29.0
45	44.2	—	---	18.0	7.0	62.0

***3. Matuahar vihar prakriti* (Maternal diet and regimen):** **S**pecific diet and activities in gestational period influence colour, complexion, constitution, personality, longevity of the foetus. The factor included under *Rasaja bhava* (nutritional factor) which maintained by nourishment and help in – *Sarira upachaya* (nourishment), *Vriddhi* (growth) , *Bala* (strength) *Varna* (colour) *Sthiti (health) and Hani (disease).*[7] Status of the dosha varies with stages of nutrition eg immediately after food intake *Kapha is predominant*, when digestion starts Pitta is predominant and when digestion completes *Vata become predominant*. These also influence the prakriti formation of an individual.

Disorders due to deficiency of maternal diet are seen as follow: Micronutrient deficiencies have been associated with significantly high reproductive risks, from infertility to fetal structural defects and long-term diseases (McArdle and Ashworth, 1999; Diet is recognized as one of the major environmental factors influencing the development of embryo and foetus. (Keen *et al*., 2003). There is evidence that indicate micronutrients supplementation in preventing some pregnancy disorders (Ladipo, 2000; Bendich, 2001; Díaz *et al*., 2003). Increasing calcium and magnesium intake can reduce the risk of pregnancy-induced hypertensive disorders; Ensuring adequate intake of iron, zinc, iodine, calcium and folic acid during pregnancy can improve pregnancy outcomes; increasing the intake of folic acid before pregnancy can reduce birth defects. maternal intake of many nutrients directly enhances the quality of breast milk (Picciano, 2003; Allen, 2005). The preconceptional period is critical in determining fetal development and health. The onset of several malformations and pregnancy related disorders i.e. congenital abnormalities, fetal loss, miscarriage, insufficient fetal growth, premature birth and pre-eclampsia may indeed occur during this period[8] .(Steegers, 2005). Black, 2001; Andersen *et al*., 2006). [10]

4.Mahabhuta vikara Prakriti: The bio transformed element of primordial component affect development of human organism at *sukshama* (subtle) as well as *sthula* levels and thus forms colour, physical built etc. For example, *Tejas Mahabhuta* is responsible for the origin of colour but its variation at the time of fertilization results in to different complexion like *Teja, Jala- Gour varna, Teja, Prithvi - Krishana varna, Tej,*

Prithvi, Akash- Krishana shyam varna, Teja, Jala Akash - Gour shyam varna.

Preconceptional Counselling with prakriti influencing factors of Ayurveda and its importance in prevention of phenotypic abnormalities:

- Primary prevention of genetic disorders depends largely on preconception information, screening and counselling.
- *Kala garbhasaya* and *Vayonupatini* helps in family planning to reduce the number of high-risk pregnancies related to increased parental age. Chromosomal abnormality noted above 35 of maternal ages. Autosomal dominant mutations increase with advanced paternal age.
- *Kulaprasakta* helps in identification of high-risk couples followed by genetic counselling to prevent the morbidity of foetus.
- Following doctrine of *Atulyagotriya adhaya* one can prevent disorders related consanguineous marriages eg. Autosomal recessive disorders.
- Advocating *Prakriti* wise *ahara vihar* regimens emphasise the do's and don'ts during pregnancy reduces phenotypic exhibition of particular prakriti in foetus which otherwise cause abnormalities in later life.
- Avoidance of fetal harmful material (*garbha upaghatkara bhava)* eg. Smoking, alcohol, exposure to radiation will help in birth of a healthy progeny.
- 'Garbhini Paricharya' properties, with *madhura, sheeta, drava* prior to and in the first months after conception, reduces the risk of congenital malformations.

Preconceptional counselling and case history analysis on the basis of *prakriti* influencing factors can be done under following point:

1. *Sukra-Sonita prakriti*	Family planning and pregnancy spacing	8. *Satmyaja Bhava (virjya, arogya, bala, varna,medha)*	Immunization status of the couple.
2. *Kulaprasakta*	Family history	9. *Purva janmakrita karmas*	Hereditary disorders.
3. *Matrija-Pitraja bhava and Satmyaja Bhava*	Genetic history of both maternal and paternal	*10. Kala Garbhashaya*	Obstetric history and Gynecologic history
4. *Sattvaja bhavas*	Psychiatric and neurologic histories	11. *Mahabhutas prakriti*	General physical examination
5. *Prakritisamya chikitsa*	Current medications	12. *Jatiprasakta*	Assessment of socioeconomic and cultural context
6. *Matura ahara vihara*	Diet habits including addiction	13. *Manasik prakriti*	Domestic abuse and violence
7. *Rasaja bhava*	Nutritional factor	14.*Pratyatmaniyata*	Environmental and occupational exposures

CONCLUSION: *Prakriti* denotes both physical and mental constitution which forms at time of the conception and influence organogenesis as well as physiological character of an individual throughout the life. These can be considered with the genetics and different genetic material that influences embryogenesis, fetal growth and development. Different factors like place and race influence the genotypic character while maternal diet and regimen, age etc influence phenotypic characters. Hence emphasising in reduction of genetics morbidity with the help of factors influencing *prakriti* in intra uterine life can certainly reduce the morbid phenotypic exhibition. Antenatal care on the basis of *prakriti samya*(balance) diet and regimen, right from the preconception to full-term delivery will certainly play a key role in the prevention of such congenital and genetic disorders in future. "Pregnancy should be after analysis of *prakriti* of parents and not by chance"; preconception counselling on basis *prakriti* can play a vital role achieving a healthy progeny, and preventing congenital and genetic disorders. Hence it should be mandatory for every couple to prevent phenotypic morbidity in neonate.

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