



ORIGINAL RESEARCH PAPER

Ayurvedic Paediatrics

SCOPE OF LAKSHANADHYAYA AND SAMUDRA SHASTRA IN AUGMENTING THE BENEFITS OF MODERN PUBERTAL EXAMINATION WITH RESPECT TO SEXUAL CHARACTERISTICS

KEY WORDS: Adolescence, Future Prediction, Kashyapa Samhita, Lakshanadhyaya, Poorva Karmas, Puberty, Samudra Shastra, Sexual Characteristics

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ABSTRACT

Introduction: Healthy endocrinal milieu is central to overall healthy development, and presence of masculine and feminine features are easily identifiable markers of this milieu. Hence their identification has been given special importance both in Vedic and modern sciences. The Vedic sciences are however unique in considering dominating role Poorva karmas in shaping one's future and accordingly produce some characteristic features, e.g. in sexual morphology. Hence if pubertal examination is done combining the findings of modern literatures with the fortune predictive elements of Vedic literatures, especially the Lakshanadhyaya of Kashyapa Samhita and the Samudra Shastra, a complete information of an individual's sexual health and the future as well can be obtained in one go. **Aim:** To analyze the gender specific morphological features described in the above two Vedic literatures in the light of modern medical knowledge, so as to lay a foundation for development of a mutually inclusive pubertal examination system. **Material & Methods:** Critical review of literatures of modern medicine, Kashyapa Samhita, Samudra Shastra and various research journals. **Review and Discussion:** Poorva Karmas can be considered as the dictating factor in morphological shaping. Different traits of vulva, vagina, clitoris and pubic hair in females and penis, testes and scrotum in males carry important information regarding an individual's genetic and hormonal affairs and some of them have predictive values which may be justified scientifically too. **Conclusion:** In context of sexual characteristics, amalgamating the future predictive elements of Vedic literatures (especially the Ayurveda) with the prevalent modern clinical examination can help develop a comprehensive method clinical examination serving the dual purpose of suggesting adequate sexual development and accordingly predict one's future too.

INTRODUCTION

Across the human history, healthy adults can be seen to be the vital determinants of a successful and flourishing society. Adolescence is that crucial phase of human life when majorly hormone driven decisive transformational changes occur that eventually convert a child to mature adult, both physically and mentally.¹ The sexual maturity segment of adolescence is specifically termed as puberty. Healthy endocrinal milieu is central to an overall healthy development, and presence of masculine and feminine features are easily identifiable reliable markers of this milieu. Hence their identification has been given special importance both in Vedic and modern sciences. However, the Vedic sciences are unique in additionally considering that *Poorva karmas* (the net merit-merit credit balance of past lives carried over into one's present birth) play a dominating role in shaping one's future, also accordingly inducing some peculiarities in physical characteristics.² Thus some sexual characteristics potentially have future predictive value, apart from them being the markers of healthy pubertal development. Here it is important to emphasize here that most of such genetically and *Poorva Karma* determined characteristics appear and/or become stable by puberty.

Basic Difference in Modern and Vedic Sciences with Respect to Examination of Sexual Characteristics in Puberty

Modern medicine literatures aims to timely identify the adequacy of sexual maturity through well structured clinical tools as SMR, but the Jyotish literatures as Samudra Shastra primarily aims to identify those variations which have future predictive value. As Lakshanadhyaya of Kashyapa Samhita is a Vedic, but pediatric medicine focussed literature, its aim can be expected to lie in between the above two and hence it identifies variations and simultaneously associates them with the future of that person.³

So if pubertal examination is done combining the exhaustive findings of modern literatures with the fortune predictive elements of Vedic literatures, especially Lakshanadhyaya of Kashyapa Samhita and Samudra Shastra, wholesome information about an individual's sexual health and future can

be obtained in one go. However no study on such an integrated approach has yet been done.

AIMS & OBJECTIVES

To analyze the gender specific morphological features described in the two Vedic literatures- primarily Ayurveda based Lakshanadhyaya of Kashyapa Samhita and primarily Jyotish based Samudra Shastra, in the light of modern medical knowledge. This will thus serve as a guide for developing mutually inclusive pubertal clinical examination system having future predictive elements too.

MATERIAL & METHODS

Literatures of modern medicine, Ayurveda and Jyotish were studied, e.g. IAP Textbook of Pediatrics, Kashyapa Samhita, Samudra Shastra and various research journals. An attempt has been made to find scientific reasons and conditions behind the findings described in aforesaid Vedic literatures.

REVIEW AND DISCUSSION

Modern science has identified markers of adequate sexual development and accordingly developed structured clinical examination methods as SMR; however many adequately developed individuals still do not translate into befitting human resources. On the other hand are the vedic literatures as Lakshanadhyaya of Kashyapa Samhita and Samudra Shastra, which instead of describing all the masculine and feminine morphological features, seem to have picked up only those which speak of health and/or foretell the future. Vedic literatures provide this advantage mainly due to their factoring in the principle of *Poorva Karmas* is shaping up the present life. An attempt has been made here to discuss the relevance of such signs in the light of modern knowledge.

Adolescence and pubertal phase is characterized by all those defining changes which effectively summate to lead to an almost final shaping to adult standards with or without some special features. Taking the modern and vedic viewpoints together, the hierarchical chain of command which bring about these changes are- *Poorva Karmas* and genetic blueprints, environmental factors, HPG axis, the androgens and the local tissue factors (tissue responsiveness). Of all the

above six factors, *Poorva Karmas* can be considered as the 'dominating/dictating factor', genes the 'essential factor', HPG axis (more specifically the Kisspeptin)⁴ as the 'master switch', environmental factors as the 'modifying factor', androgens as the 'chief/decisive artisan' (especially during the second decade of life) and local tissue factors as the 'fine tuners'.

Morphological Features of Genital Region in Females

(1) Development & Maturity of Vulva, Vagina and Clitoris

(A) The Key Responsible Factors

Modern Perspective: Female external genitalia develop largely in absence of androgen signaling rather than through active hormonal induction, e.g., DHT is required for male external genitalia. Hence, absence of DHT leads to formation of clitoris, labia majora, labia minora, vestibule and vulva.⁵ Although fetal vulvar structures form largely independent of estrogen, estrogens become critical postnatally. From puberty onwards estrogen becomes the principal driver of development of female sexual organs as vulva, vagina, cervix, uterus and hymen, through different receptors to produce.⁶

- Maturation and thickening of epithelia
- Enhanced vascularity
- Accumulation of glycogen
- Differentiation and programmed deposition of adipocytes in the region of mons pubis
- Maturity of the labia
- Pigmentary changes
- Increase in elasticity owing to collagen and elastin remodeling and extracellular matrix synthesis
- Maturity and enlargement of glands in vestibular region
- Enhanced hydration and unctuousness
- Neurosensory maturity
- Hymenal changes namely increase in thickness, elasticity and vascularity and formation of redundant folds, leading to formation of typical highly elastic and morphologically variable adult hymen.

There is a minor role of adrenal androgens too.

Vedic Perspective: The integrator and director of all above changes can be viewed to be the *Poorva Karmas*, which additionally produces some future predictive attributes too.

Broader clinical significance: Altered hormonal environments can thus alter normal development in various ways, e.g., congenital adrenal hyperplasia (CAH) may lead to virilization of external genitalia, producing clitoromegaly, fusion of labia, etc.

(B) Morphological Features of Female Genital Region Described in Vedic Texts of Lakshanadhyaya and Samudra Shastra

i) As Per Lakshanadhyaya of Kashyapa Samhita³

Feature of vulva or vagina	Future
1. Cart shaped Yoni (vulva)	Perfect for progeny
2. Corpulent (vulva)	Lucky
3. Elongated	Progeny dies
4. Rounded	Prostitution
5. Upwardly pushed	Infertility
6. Pinhole	Bad luck
7. Vagina excessively dilated, constricted, dry, long or uneven. Clitoris absent (inconspicuous)	Sufferings
8. Vulva heavy in center	Births female baby
9. Bulgy, beautiful and corpulent	Births male baby
10. Presence of (any) birthmark/mark (e.g. spot or mole)	Nobel
11. Excessively hairy	Widowhood
12. Absence of (any) body mark (e.g. mole)	Infamy
13. Bears warts (or spots) and fat (deposits)	Prostitute, wanderer

ii) As Per Samudra Shastra⁷

Feature of vulva or vagina	Future
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1.	Yoni is elevated and convex like shell of tortoise or shoulder of elephant	Auspicious
2.	Symmetrical; shaped like a lotus petal or Peepal leaf	Auspicious
3.	Vulva is broad, fleshy, smooth, firm, raised, dense, with downy hair	Auspicious
4.	Texture of Yoni comparable to soft rodent fur. Concealed clitoris	Lucky
5.	Vulva raised towards right	Births son
6.	Vulva raised towards left	Births daughter
7.	Irregular shaped like a deer's hoof, or central portion of traditional mud stove (chulha)	Sorrowful life
8.	Vulva hairy, permanently wide open, with easily visible clitoris	Inauspicious
9.	Vulva bamboo or willow leaf shaped, having coarse hair like on elephant skin	Inauspicious
10.	Abnormal shaped/tortuous/asymmetric/hollow appearance	Inauspicious
11.	Narrow/small, deep and dry/coarse vulva	Inauspicious
12.	Twisted towards left	Widowhood
13.	Flat, like a coconut shell	Servant
14.	Has three lines	Infertile

iii) Corresponding Variations Described in Modern Literatures

- 1. Vulvar Conditions:** Elongated or asymmetric vulva can be a normal variant or occur due to aging, hormonal impacts, continual traction, lymphedema and rarely tumor or cyst. Chronic inflammatory disorders of skin, e.g. Lichen sclerosus, can cause scarring of vulva, narrowing of the vaginal opening, fusion of hood of clitoris (reducing its visibility) and dyspareunia. Lichen planus can affect vulva and vagina together and lead to erosions, scars, dryness and stenosis of vagina.
- 2. Clitoris Conditions:** Concealed clitoris may be seen in post inflammatory scarring or in rare condition of congenital clitoral agenesis. It reduces the sensation in genitalia and can cause sexual dysfunction or chronic pain if scarring has occurred. Whereas clitoromegaly is a sign of virilization and hence seen in CAH, PCOD, or androgen secreting tumors and in such cases other accompanying include shrinkage of uterus, breasts turning smaller, stoppage of normal menstruation, sometimes infertility.⁸
- 3. Vaginal Conditions:** Weakness of muscles of pelvic floor, connective tissue diseases (as Ehlers-Danlos syndrome) and estrogen deficiency can cause excessively dilated vaginal canal. This leads to problems as incontinence, prolapse and altered sexual function. On the other hand, congenital stenosis or septate vagina, chronic inflammatory/post-surgical/post-traumatic scarring can cause narrow (stenosed) vaginal canal, leading to problems as dyspareunia, obstruction to menstrual outflow (if congenital) and sometimes infertility. Low estrogen levels and autoimmune disorders (as Sjögren syndrome) can cause vaginal dryness. This leads to burning sensation, irritation, repeated urinary tract infections, dyspareunia and enhanced vulnerability to minor traumas.

(2) Development & Maturity of Pubic Hair in Females

(A) The Key Responsible Factors

Modern Perspective: The development of pubic (and axillary) hair as well occurs independent of the HPG axis and is mainly driven by the weak adrenal androgens - Dehydroepiandrosterone (DHEA), DHEA sulfate (DHEAS) and androstenedione produced by the adrenal zona reticularis. A gradually rise in these cause a activation of follicles across the pubic triangle, leading to conversion of vellus follicles to terminal follicles because of activation of androgen receptors and dermal papilla, enhanced

production of keratin and stimulation of melanocytes. All this leads to transformation from no terminal hair on pubic region to fine, non-pigmented downy hair to adult type terminal hair (curly, coarse, dense, thick and dark) in the typical inverted triangular pattern, spreading slightly over medial part of thigh.⁹

Vedic Perspective: The integrator and director of all above changes can be viewed to be the *Poorva Karmas*, which produce some future predictive attributes too.

Broader clinical significance: Pubic hair development is thus a marker of appropriate secretion and functioning of adrenal androgens.

B) Morphological Features of Pubic Hair in Females Described in the Vedic Texts of Lakshanadhyaya and Samudra Shastra

(i) As Per Lakshanadhyaya of Kashyapa Samhita-³

Feature of Romaraji	Future of child
Present on both sides of midline and directed towards midline (center). Not very dense	Praiseworthy
Extremely thick	Widowhood
Sthula	Thief, widow, misfortune/bad luck
Downwardly directed	Misfortune
Covering/reaching upto umbilicus	Medium category

(ii) As Per Samudra Shastra-¹⁰

Feature of Romaraji	Future
Black, crooked/distorted/malformed, thick, worn out (split)	Thief, widow, bad luck

(iii) Corresponding Variations Described in Modern Literatures

1. Delayed pubarche can be simply constitutional or due to hormonal deficiencies (e.g. primary adrenal insufficiency, hypothyroidism/panhypopituitarism) or an element of genetic syndromes (e.g., Turner syndrome).⁶
2. Early pubarche though harmless in over 90%, may occur due to CAH or virilizing tumors. Virilization manifests as in hirsutism, severe acne, lifelong deepening of voice, enhanced muscle mass, body fat redistribution, baldness in male-pattern, clitoromegaly and excess sexual drive. IN CHILDREN, growth acceleration may occur which if untreated may lead to short stature because of premature closure of the growth plates of the bones. Thus untreated virilization may lead to multiple complications, such as psychological repercussions, infertility (owing to hormonal imbalances), metabolic disorders as PCOS can predispose one to metabolic syndrome, diabetes and even cardiovascular diseases.⁹

Morphological Features of Genital Region in Males

(1) Development & maturity of penis, testes and scrotum

(A) The Key Responsible Factors

Modern Perspective: Male external genitalia develops largely in the presence of androgen signaling. E.g., DHT is required for male external genitalia.¹¹

The development completes in puberty, beginning with the reactivation of hypothalamic GnRH neurons, which mainly ends up in LH stimulating testosterone synthesis and FSH promoting seminiferous tubule growth and spermatogonial proliferation, formation of androgen-binding protein and inhibin B secretion. All this adds up to cause testicular enlargement, the first clinical sign of male puberty. Thereafter, progressively rising testosterone leads to a parallel maturation of testes, scrotum and penis, manifesting as massive testicular volume increase, scrotal darkening and rugosity and penile growth.¹² Hence testosterone lies central to various variations in testicles and scrotum. Puberty is also associated with a marked increase in growth hormone which stimulates hepatic production of insulin-like growth factor-1 which promotes growth spurt, testicular growth and enlargement of penis.

Progressive development of male sexual characteristics is mediated by various receptor mediated coordinated cellular processes that may be summarized as-¹³

- Cellular proliferation and angiogenesis (within the genital tissues, promoted by VEGF and fibroblast growth factors: Both these are mainly stimulated by testosterone.
- Remodeling of extracellular matrix: Growth factors stimulate the synthesis of collagen, deposition of elastin and activity of matrix metalloproteinase.
- Hypertrophy of smooth muscles: Proliferation of smooth muscle, remodeling of cavernosa and increased signaling of nitric oxide leads to development of penis and its erectile abilities.

Vedic Perspective: The integrator and director of all the above changes can be viewed to be the *Poorva Karmas*, which also impart future predictive attributes to the sexual characteristics.

Broader Clinical Significance: Abnormal hormonal environments can thus alter normal development and or produce morphological peculiarities, e.g. cryptorchidism, micropenis.¹⁴

(b) Morphological Features and Variations of Male Genital Region Described in the Vedic Texts of Lakshanadhyaya and Samudra Shastra

(I) Testicular and Scrotal Development

I) As Per Lakshanadhyaya of Kashyapa Samhita-³

Feature of scrotum	Future of child
1. Reddish and hairy	Mediocre (life, luck)
2. Corpulent	Praiseworthy
3. Small	Bad luck; impotency and loss of offspring
4. As of ox, ass, horse, goat or sheep	Good luck and longevity

ii) As Per Samudra Shastra-⁷

Feature of scrotum	Future
1. Big	100 year life (long life)
2. Opposite of above, i.e. small (raised high up)	Short life, bad fortune, less potency, loss of progeny

iii) Corresponding Variations Described in Modern Literatures

Small Sized Testes or Scrotum: Occurs in cryptorchidism, undescended testicles, congenitally absent testicles, scrotal tissue aplasia/hypoplasia,¹² which may lead to infertility or even testicular cancer in untreated undescended testes.

(II) Phallic Growth

It is driven by testosterone and its potent metabolite DHT. As higher systemic testosterone levels (produced by mature Leydig cells) are needed for phallic growth, testicular enlargement precedes phallic growth.¹² This causes increase in length and diameter of penis, along with enlargement of glans and erectile maturity.

i) As Per Lakshanadhyaya of Kashyapa Samhita-³

Feature of penis	Future
1. Penis is soft, long & erected. Glans is large, uncovered and copper colored. Large (considerably) prepuce and meatus	Praiseworthy
2. Thin, too short/too long, without prepuce, covered from left	Inauspicious
1. With white/black discharge	Inauspicious

ii) As Per Samudra Shastra-¹⁰

Feature of penis	Future
1. Has plenty of veins	Less progeny
2. Rough, hard/rigid/firm/inflexible, thick	Adultery
3. Opposite of above	Poor
4. Small	Rich
5. Very small	No offspring

iii) Corresponding Variations Described in Modern Literatures

a) Abnormal Size:

- **Micropenis/Microphallus:** Significantly smaller phallus can occur due to early-stage hormonal/ endocrinal deficits.
- **Hidden/Buried Penis:** May occur due to it being concealed by surrounding pads of fat, e.g. in obesity.¹⁹
- **Agenesis:** It is an extremely rare condition.⁹

B) Abnormal Shape:

- **Penile Torsion:** It is uncommon and occurs along its length.
- **Chordee:** It is a birth defect in which the penis curves, usually downward or sideways, owing to tightness of the tissue beneath.
- **Peyronie's Disease:** It is an acquired deformity causing a painful bend/hourglass shape of penis occurs during erection.
- **Phimosis and Paraphimosis:** These are the acquired deformities.

The cause of above disorders can be genetical, hormonal or environmental or a combination of these. However, the etiologies of most of these converge on insufficient testosterone production or receptor insensitivity. Congenital developmental disorders can also occur due to intrauterine exposure to some endocrine disrupting chemicals. Early identification of these issues and their causative factors is the key to prevention/minimization of lifelong consequences, and the Vedic parameters may thus be viewed as important whistle blower signs in this regard.

(2) Development & Maturity of Pubic Hair in Males

As in females, adrenal androgens DHEA and DHEAS and androstenedione androgens transform the vellus follicles in pubic region (and axillary too) to mature into terminal follicles.⁸ Hence, such transformation is an important marker of adequate functioning of adrenal axis.

View Point of Lakshanadhyaya and Samudra Shastra

Unlike females, the Vedic literatures have not specifically and separately described the features of pubic hair in males, probably because they might have not found future predictive roles associated with them in males.

CONCLUSION

Modern science has identified a number of markers of adequate sexual development characteristics and has come up with well structured clinical examination methods as SMR; however many adequately developed individuals still do not translate into equally good human resources. On the other hand are the vedic literatures Lakshanadhyaya of Kashyapa Samhita and Samudra Shastra, which instead of exhaustively describing all the masculine and feminine morphological features, seem to have picked up only those specific features which not only speak of the health but also foretell the future of that person, as they believe in the principle of *Poorva Karmas* is shaping up a human's present life. Most of such future predictive signs actually carry hidden scientific reasoning. Thus a mutually inclusive clinical examination system of sexual morphology can be developed which can serve the dual purpose of suggesting adequate sexual development and predict the future too. This will help the individual to either timely modulate his/her development in right direction or at least plan his life in a best possible manner in accordance with one's morphological typicality. However a long term scientific study is needed to affirm these inferences.

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