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SAHAJA ADHIKA-ANGATA AND JANMAJATA-VIKRITI: A CASE REPORT HIGH-LIGHTING ITS ASSOCIATION WITH PREAXIAL POLYDACTYLY AND POSTERI-OR URETHRAL VALVES

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ABSTRACT

Background: Polydactyly is one of the most frequent congenital skeletal malformations. Dysmorphism of extremities, including pre-axial and post-axial polydactyly, is an autosomal dominant disorder often seen in renal involvement in most affected individuals, termed acro-renal syndrome.

It consists of structural and functional abnormalities such as kidney hypoplasia/dysplasia, renal agenesis, multicystic, horseshoe or duplex kidneys, VUR, hydroureter, hydronephrosis and obstruction at the vesicoureteric or uteropelvic junction. In this regard, Ayurveda explains several principles of genetic and congenital disorders and conducts for healthy progeny and the birth of a healthy child (*Shreyashipraja*).

Case report: This study reported a neonate with preaxial polydactyly and posterior urethral valves with no family history. Proper evaluation with urinary catheterization and cystostomy relieved urinary obstruction. Basic concepts of Ayurveda were elaborated upon while evaluating the multiple congenital anomalies.

Conclusion: The presence of one congenital anomaly is an indirect indicator of abnormalities in the other systems. Basic principles of Ayurveda should be considered during ANC counseling, ANC care, and evaluation of multiple anomalies in newborns.

Keywords: Sahaja Vikriti, Janmajata Vikriti, Adhikangata, Polydactyly and PUV, Newborn anomalies and Ayurveda, Adhikaavayotpatti, ANC care and counseling.

INTRODUCTION

Ayurveda, the never changing and ever-changing science, explores and elucidates the concept of genetics that has flourished from ages till date. 'Ayur genomics', a recently introduced research field, bridges the gap between Ayurveda and genomics and aids in understanding modern concepts through its paradigm. It emphasizes not only disorders but their prevention, too. Acharya described inherited or genetic disorders under the headings of *Sahaja*, *Kulodbhava*, or *Adibala* pravritta[1]. They underlined the concept of planning for better progeny, which starts even before marriage. The roots of genetics are already there in Ayurveda, which is cited at various places in classical texts such as *Beeja* (sperm and ovum), *Beeja bhaga* (chromosomes), *Beeja bhaga avayava* (Genes)[2]. It has a relevant description regarding the *Sharira Rachana*, and anatomical abnormalities related to the human body, mainly arising from genetic and congenital factors. The *Garbhajanya Vikriti* arises from the maternal or paternal defects associated with progeny. Defects in *Beeja* & *Beeja bhaga* provoke the pathogenesis of such types of diseases. As per Ayurveda *Matruja, Pitruja, Rasaja, Satmyaja, Sattvaja, and Aatmaja factors play a significant role in healthy progeny*, and any abnormalities or vitiation in these factors may elicit *Garbhajanya Vikriti*[3]. These six factors, interpreted as Shadgarbhakara bhavas, play an essential role in healthy progeny and normal childbirth. So, the root of genetics is already there in Ayurveda, cited in various places in classical texts.

OBJECTIVES OF THE STUDY:

To study the concepts of Acro-renal syndrome and *garbhangavikriti* and to suggest a protocol for their prevention with basic principles of Ayurveda.

MATERIALS:

The study used classical literature on Ayurveda, modern medical science on Embryology and Neonatology, and e-journals. The data obtained was critically reviewed.

METHODS:

This present conceptual study focuses mainly on interpreting and analyzing the explored literature.

CASE:

A preterm male neonate weighing 2.120 kg was born to a G2P2A0D1 mother after an uneventful preterm pregnancy by spontaneous delivery at 34 weeks of gestation. The APGAR score was seven at one minute of life, reaching eight at five min and nine at ten minutes of life. An unremarkable maternal antenatal history and negative consanguinity were reported except for the peri-natal USG at 34 weeks of gestation, which showed B/L preaxial polydactyly radial side in both arms. There was a history of prolonged rupture of membranes, foetal distress and passage of meconium.

The neonate presented with mild respiratory distress during the first few hours of life, which ceased after being treated with oxygen with nasal prongs. On examination, he appeared LBW and weighed 2.120 kg. No facial dysmorphism was present. There was preaxial polydactyly of both upper limbs. Respiratory sounds were clear on both sides, and heart sounds were normal. Saturation was normal in all four extremities. The anal opening was normal. Examination of the external genitalia revealed normal penis size with palpable testicles of normal size. Results of laboratory tests, including blood urea nitrogen/ creatinine ratio, were within the normal range.

On DOL 2nd, it was observed that the baby had not passed urine in 48 hours, so an NS bolus was given, and USG abdomen and pelvis were done. Abdominal sonography revealed the urinary bladder was over distended with a keyhole appearance, suggestive of a posterior urethral valve. The baby passed urine after urinary catheterization. Intravenous antibiotic therapy was initiated, followed by pertinent laboratory tests.

The pediatric surgeon's opinion was taken as the baby had c/o difficulty in micturition. Micturating cys-

tourethrogram and catheterization was advised. Micturating cysto-urethrogram done on DOL 5th showed: Trabeculations in urinary bladder, Dilated posterior urethra, Small vesicoureteric reflux in left terminal ureter. Findings were consistent with the posterior urethral valve.

On DOL 10th, the baby was operated for cystostomy under GA by a pediatric surgeon. Follow-up visits and integral counseling were provided for the parents.

***Pradhana vedana vishesha* (Chief complaints):** *Adhika-anguli* (polydactyly), *Mutravaha srotorodha*, *Mutrasanga* (urine retention), *udara-vriddhi* (mild abdominal distention)

***Kulavrutta* (family history):** No history of consanguinity found; Pitruja *kula*: family history of polydactyly

Balaka awastha: *Ksheerapa avastha*

***Janma-Iti Vrutta* (Birth history):**

a) ***Garbha Kalina*:** Antenatal USG at 34 weeks of gestation showed B/L preaxial polydactyly radial side in both arms. G2P2A0L0D1, history of PROM 12 hrs.

b) ***Prasava Kalina*:** Preterm normal vaginal delivery. The baby cried immediately after birth.

c) ***Jata matra*:** Aspirated thin MSL, no respiratory distress or symptoms that needed NICU care.

***Navajata Balaka Pariksha*:** Akal Prasuta Balaka (preterm baby)

Navajata Balaka Pratikshipta Kriya (Neonatal Reflexes): Rooting, Sucking, Swallowing, Tonic neck reflexes were present, Moro's reflex B/L symmetrical

***Sharirik Parinama* (Anthropometry):** Weight 2.120 kg, Height 46.7cm, Head circumference 32.4cm, Chest circumference 30.8cm, *Shirorandhra* (fontanels) AF wide

***Astavidha Pareeksha*:**

1. *Nadi- Vatadhika tridoshaja*.
2. *Mutra*- There were complaints regarding the reduced frequency of urine.
3. *Mala*- Passes with dark colour thrice every day.
4. *Jivha- Niram*
5. *Shabda- Samanya* (Vigorous cry)
6. *Sparsha*- Dry skin (*Ruksha*)
7. *Druk- Samanya* (Both the eyes are equal, with well-defined parts).
8. *Akriti- Krusha* (Lean/LBW)

Nidana Panchaka:

Hetu*: Beeja Dushti, Matruja Garbhavastha Kalina Asamyak Ahar-Vihara* (faulty regimen of mother)

Poorvaroopa: No significant *Poorvaroopa* seen except for antenatal USG of the mother at 34 weeks of gestation, which showed there is B/L preaxial polydactyly radial side in both arms

Roopa: *Mutrasanga, Udara-vriddhi, Adhikanguli,*

***Samprapti ghataka*:**

a. Dosha: Vata
b. Dushya: Rasa,Rakta, Meda, Asthi, Kleda
c. Mala: Mutra
d. Agni: Asthi+Meda dhatwagni dushti
e. Udbhavasthana: Pakwashaya, Asthi
f. Adhisthana: Basti, Asthi
g. Srotas: Asthi +Meda + Mutravaha srotas
h. *Sroto dushti lakshana: Mutrasanga, Mutramargavaroda, Mutravaha sroto vaigunya*, *Adhikanguli*.

***Vyadhi Vinishchaya* (Diagnosis):** *Sahaja Adhikangata (Adhika-anguli) sahen Mutravaha sroto vikriti* (Acro renal syndrome- Polydactyly with posterior urethral valve obstruction)

Table 1: DIAGNOSTIC ASSESMENT (*Prayogshalin Parikshana*)

Investigation	Date	Test name	Value
Blood group	19/06/2024	-	B Rh Positive
Chest X-ray	19/06/2024	-	Asymmetrical bilateral patchy opacities.
Sepsis screen	20/06/2024	HGB HCT WBC PLT CRP	14.4 g/dl 38.7% 11,490 /ul 213000/ul 19.9 mg/dl
Urine routine and	21/06/2024	Colour	Pale yellow

microscopic		Appearance Reaction Albumin Bile salts and pigment Pus cell Red blood cell Epithelial cell Casts crystals	Clear Acidic Traces Absent 4-5/hpf Absent 5-6/hpf Absent Absent
USG Abdomen Pelvis	21/06/2024	-	The urinary bladder is over distended with key hole appearance, possibility of posterior urethral valve.
Renal function test	22/06/2024	Blood urea level Creatinine Uric acid	25.4 mg/dl 0.44 mg/dl 3.9 mg/dl
Sr bilirubin	23/06/2024	Total bilirubin Direct bilirubin Indirect bilirubin	10.9 mg/dl 0.41 mg/dl 10.49 mg/dl
Jaundice screen	24/06/2024	Total bilirubin Direct bilirubin Indirect bilirubin	7.32 mg/dl 0.33 mg/dl 6.99 mg/dl
	24/06/2024	Reticulocyte count	3.0 %
	24/06/2024	Direct Coombs test	Negative
	24/06/2024	G6PD	Decoloration within 45 mins
Micturating cystourethrogram	24/06/2024	-	Trabeculations in the urinary bladder. Dilated posterior urethra. Small vesicoureteral reflux in the left terminal ureter.
Otoacoustic Emission Test	25/06/2024	-	PASS
Renal function test	26/06/2024	Blood urea level Creatinine Uric acid	10 mg/dl 0.39 mg/dl 3.3 mg/dl
Sepsis screen	27/06/2024	HGB HCT WBC PLT CRP	15.8 g/dl 43.9 % 14,110 /ul 313000/ul 2.5 mg/dl
Liver function test	27/06/2024	Bilirubin Total Bilirubin Direct Bilirubin Indirect Aspartate aminotransferase Alanine transaminase Alkaline phosphatase Protein total Albumin Serum globulin Serum A/G ratio	8.50 mg/dl 1.00 mg/dl 7.50 mg/dl 46 IU/L 21 IU/L 194 IU/L 6.5 gm/dl 3.9 gm/dl 2.6 gm/dl 1.50
	27/06/2024	Bleeding Time Clotting Time Prothrombin Time	1.00 Min 4.55 Min 15 Seconds
	27/06/2024	TRIDOT HIV Hepatitis B	Negative Negative

Table 2: TIMELINE OF DISEASE ACTIVITY WITH INTERVENTION

Timeline	Clinical Events and Intervention
June 18, 2024	Prenatal suspicion of PUV: USG Gravid Uterus [TAS] showed a single live intrauterine fetus in vertex presentation of average gestational age 33 -34 weeks. Bilateral preaxial polydactyly -radial side in both hands.
June 19, 2024	A male baby was delivered by normal vaginal delivery on 19/06/2024 at 06:36 AM, having vertex presentation and aspiration of thin MSL. Advised for chest X-ray AP view. Blood grouping is done.
June 20, 2024	Advised for sepsis screen. In the view of probable sepsis, IV antibiotics were started.
June 21, 2024	During rounds, parents complained that the baby had not passed urine in 48 hrs. IV NS bolus 10ml/kg was given, and urinary catheterization was done. Advised Urine routine and microscopic. Advised USG Abdomen and Pelvis.
June 22, 2024	Advised Urologist opinion, advised MCU (micturating cystourethrogram), RFT and urinary catheterization.
June 23, 2024	The baby had yellowish discoloration of skin, mucosa and sclera. Advised Sr Bilirubin levels, Phototherapy started.
June 24, 2024	Advised Sr bilirubin, reticulocyte count, Direct Coombs test and G6PD assay. The baby was shifted to the mother. Micturating cystourethrogram done. Advised Pediatric surgeon opinion.
June 25, 2024	OAE test done.
June 26, 2024	Advised RFT
June 27, 2024	Advised Cystotomy, Advised preoperative investigations (HIV, Hepatitis-B, BT-CT, Prothrombin time, LFT, CBC).
June 28, 2024	The baby was referred to the higher centre of surgical intervention. Cystotomy under GA by a pediatric surgeon was done.

Fig 1: Left hand had an extra thumb.

Fig 2: Both hands of the neonate

Fig 3 Photograph of the neonate

Fig 4 : Preaxial polydactyly of the right hand

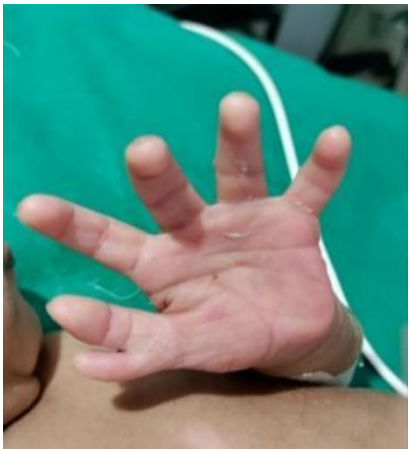


Fig 5 X-ray of Abdomen Pelvis

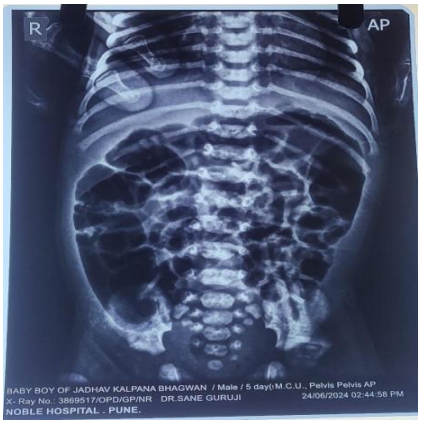
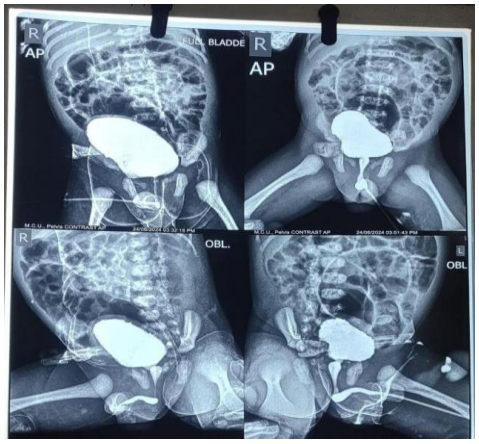


Fig 6 Micturating cystourethrogram:



Polydactyly:

Duplication of a digit, known as Polydactyly, can occur either as a preaxial deformity (involving the thumb) or a postaxial deformity (affecting the small finger). These malformations have an inherited and genetic component. In Indians, the duplication of the thumb occurs more often and is mostly unilateral. Transmission is typically in an autosomal dominant pattern. It is linked to defects in genes confined to chromosome No. 2.[4]. Duplication of the thumb is subdivided based on the degree of duplication into

seven types. Small finger duplication has been further subdivided into two types.

Posterior Urethral Valves:

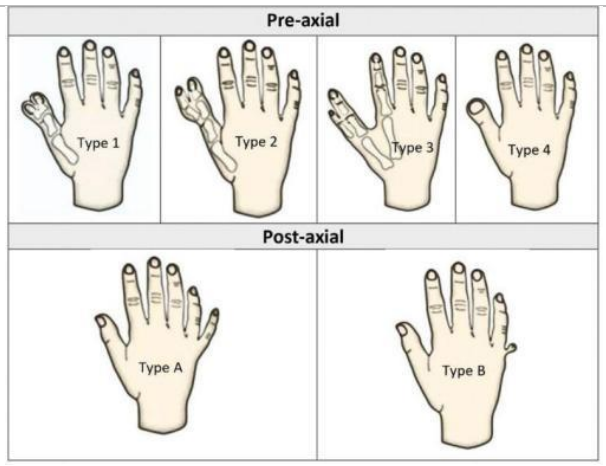
Posterior urethral valve is the most prevailing cause of severe obstructive uropathy in children. The urethral valves are tissue leaflets fanning distally from the prostatic urethra to the external urinary sphincter, which have an unclear embryologic origin and may cause varying degrees of obstruction. The prostatic urethra dilates, and the bladder muscle undergoes hypertrophy. Vesicoureteral reflux is common, and distal ureteral obstruction can result from chronically distended bladder or bladder muscle hypertrophy. A range of renal changes, such as mild hydronephrosis to severe renal dysplasia, are observed; their severity probably depends on the obstruction's severity and its onset time during fetal development. In other cases of obstruction or renal dysplasia, there may be oligohydramnios and pulmonary hypoplasia. Affected boys with posterior urethral valves are often discovered prenatally when maternal ultrasonography reveals bilateral hydronephrosis, a distended bladder, and, if the obstruction is severe, oligohydramnios. A clinical suspicion of posterior urethral valve should be raised in the male neonate when there is a palpably distended bladder and a weak urinary stream. Infants can present later in life with failure to thrive because of uremia or sepsis caused by infection in the obstructed urinary tract. If the obstruction is severe and goes unrecognized during the neonatal period, wherein with lesser degrees of obstruction, children present later in life with difficulty in achieving diurnal urinary continence or with UTI. VCUG or perineal ultrasonography is done to establish the diagnosis. After the establishment of proper diagnosis, renal function and the anatomy of the upper urinary tract should be evaluated cautiously. In the healthy neonate, a small polyethylene feeding tube (No. 5 or No. 8 French) is inserted in the bladder and left for several days. If the serum creatinine level remains normal or returns to normal, treatment consists of transurethral ablation of the valve leaflets, performed endoscopically under general anaesthesia. If the urethra is too small for transurethral ablation, temporary vesicostomy is preferred, in which the dome of the bladder is exteriorized on the lower abdominal wall. The vesicostomy is closed when the child is older with ablation of the valves.[5]

Table 3: Syndromes associated with Polydactyly

SYNDROMES ASSOCIATED WITH POLYDACTYLY [6]
1. Carpenter syndrome
2. Ellis-van Creveld syndrome
3. Meckel-Gruber syndrome
4. Polysyndactyly
5. Trisomy 13
6. Orofaciodigital syndrome
7. Rubinstein-Taybi syndrome

Table 4: Showing presentations of Polydactyly

PHENOTYPIC PRESENTATION OF TYPES OF PRE-AXIAL POLYDACTYLY AND POST-AXIAL POLYDACTYLY[7]



EMBRYOLOGY OF SKELETAL AND UROGENITAL SYSTEM:

The skeletal and urogenital systems share a common embryological origin, the mesoderm. Bones of the limbs arise from the somatopleuric layer of the lateral plate mesoderm. In contrast, the urogenital system is derived from the intermediate Mesoderm and the primitive urogenital sinus (UGS), a part of the cloaca. Thus, it can be concluded that urogenital and skeletal systems have an interrelated relationship, and insult to mesoderm during embryogenesis may cause defects in both organs. Therefore, diagnosing congenital skeletal anomalies should alert physicians to the possible presence of urogenital defects.[8]

SIMILARITIES BETWEEN MASANUMASIKA VRIDDHI KRAMA AND MODERN EMBRYOLOGY:

Acharya Charaka has described that during the third month of gestation, all the indriyas and limbs, along with their organs, manifest themselves concurrently[9] whereas Acharya Sushruta stated that *Sarva Indriya* and *Sarva Angavayava* manifest them simultaneously in the third month of pregnancy. Five buds (*Pindaka*) develop, representing four limbs and head formation. The *Anga Pratyanga* begins to form but all are in very nano form.[10] Similarly, as per Modern science, in the third month of gestation, ossification centers appear in most fetal bones, and fingers and toes differentiate. Skin and nails develop & scattered rudiments of hair disappear. The external genitalia begin to show definitive signs of male and female gender. Urine formation begins with the ossification of all long bones, which is very close to Acharya's description of *Masanumasika vriddhi* krama.[11]

***"PAKWASHAYA"* THE CONNECTING DOT BETWEEN *ASTHI* AND *MUTRAWAHA STROTAS*:**

***ASTHI DHATU*:**

The hardest *dhatu* in the body is *Asthi dhatu* or bone. *Kikas, kulya, medoja, medoteja* are the synonyms of *Asthi dhatu*. The site is present under the skin all over the body. *Meda dhatu* & *Jaghana* (flat pelvic bones) are *moola sthana*(origin) of *asthi dhatu. Meda* is formed before *asthi dhatu*. The nutrition of *asthi dhatu* depends on the proper nourishment of *medo dhatu*. According to *dhatuposhana nyaya*, the origin of *asthi dhatu* takes place on account of the specific action of *asthi dhatwagni* and *asthi poshakamsha*, which is formed at the time of *medo dhatu utpatti*.[12]

KALA:

Purisha-dhara kala is the 5th *kala* in the large intestine, i.e. in *pakvashaya*. The function of *purisha-dhara kala* is to separate the constituents of *kitta*. *Pakvashaya* and *asthi* are both the main seats of *Vata dosha*. Therefore, increased or decreased formation of *Vata* and *purisha* affects all sites of *Vata*, especially *asthi dhatu*. Hence, *purisha-dhara kala* is also called *asthi-dhara kala*. The precursor of *asthi dhatu* (Poshaka asthi) is formed at the time of the formation of *medo dhatu*.[13]

***MUTRAVAHA SROTAS*:**

Basti and *Vankshana* have been considered the origin of *Mutravaha strotas*. *Poshaka mutra* collects *kitta*

from all body. Its formation starts in the *pakvashaya* (large intestine). *Purisha dhara kala* separates *poshaka mutra* from *kitta* in *pakvashaya*. Therefore, *pakvashaya* is considered the root of *mutravaha srotas.* [14]

CONCEPT OF URINE FORMATION IN AYURVEDA:

The process of urine formation begins in *pakvashaya*. The *poshaka mutra*, separated from *kitta*, is absorbed from *pakvashaya* and brought to *basti*-like water in the river, which is continuously drained into the ocean. Urinary ducts (*mutravaha nadi*) drain urine from *pakvashaya* and carry *poshaka mutra* to *basti*. Urinary ducts and fine branches are spread in the abdominal cavity around *pakvashaya* and *amashaya*, which constantly drains *poshaka mutra* to *basti*. *Basti-purana* (drainage of with new *ghata* (earthen pot) immersed in water. When an earthen pot is new, it is very porous, and it diffuses water easily similarly, urine from urinary ducts enters the *basti*, and urine is formed and stored in the *basti*. When *basti* gets filled with urine, due to the action of *apana vayu*, urine is excreted.[15]

MEDOVAHA SROTAS:

Vrikka (kidneys) and *vapavahana* (omentum) are roots of *medovaha srotas*. In intrauterine life, kidneys are formed from *medo dhatu*. According to Acharya Sushruta, *kati* (pelvic girdle) is a root of *medo dhatu*. *Medodhara kala* occupies the peritoneum and small bones & *mamsa*. *Medo dhatu* is present inside the small bones. *Asthi poshana* is an essential function of *medo* dhatu.[16]

PAKWASHAYA:

Pakwashaya is a *matrija-avayava* (maternal origin) and is specially referred to as the seat of *vata*. It is connected to *mutra-vaha nadis* and contains *shushira snayu* and *pureeshadhara kala (ashthidhara kala)*. [17]

HYPOTHESIS FOR PATHOGENESIS OF ACRO RENAL SYNDROME WITH AYURVEDIC PERSPECTIVE:

Asthi dhatu is formed from the precursor *Meda dhatu*; *Medodhatu* flows into the *Purishadhara kala* and is digested by *Asthi-Agni*. Most of the pathologies related to *asthi dhatu* are due to *vata* vitiation. According to *Ashraya-Ashrayi Bhava asthi* is the seat of *vata dosha*. *Asthi vriddhi* can be observed in various genetic pathologies.

Pakvashaya is the root of *mutravaha srotas*, which is also connected to *asthidhara kala(pureeshadhara kala)* and is a seat of *vata*. Hence *Vatavriddhikara ahara vihara* during *Garbhini avastha* can cause *Medo dushti*, which results in *Asthi vikriti* and *Vrikka vikara*'s as *Medodhatu* is a precursor for *Asthi* and *Vrikka*. *Kha vaigunya* by vitiated *vata* in *pakwashaya* may cause *mutravaha nadi dushti* and *dushti* in *Pureeshadhara kala (Asthidhara kala)*, which may play a pathological role in the formation of acro-renal syndromes.

ROLE OF VATA IN THE PATHOGENESIS OF CONGENITAL DISORDERS:

Vata represents *Vibhajana* (cell division and differentiation), a vital force that divides the zygote into different limb buds and organs. Perturbations in vata are responsible for *Garbhavikruti*. *Vataja* perturbations may lead to anaphase lag, a commonly found error of cell division during meiosis, which leads to abnormal chromosomal numbers, such as non-disjunction, and anaphase lag. *Vata* vitiation may lead to *heenanga* or *adhikanga*, which can be considered either with visible congenital anomalies like polydactyl or the absence of a visible part.[18]According to Acharya Charaka, consumption of *Vata* vitiating diet by a woman can result in deafness, dumb, having a hoarse or nasal voice, lame, humpback, dwarf, possessing less or more body parts in progeny.[19]

Charaka states that the *Sahaja Vyadhis* develop in those parts of the body whose corresponding chromosome is damaged "*Yasya yasya hi anga avayavasya beeje beejabhaga upatapto bhavati, Tasya tasya anga avayavasya vikritir upajaayate*".[20]

PRECAUTIONARY MEASURES FOR THE PREVENTION OF CONGENITAL DISORDERS EXPLAINED IN AYURVEDIC TEXTS [21]

Implementing *Upanayana Samskara, Rajaswala Paricharya, Atulyagotra Vivaha, Naistiki, and Vaivahi-*

ka Brahmacharya, Parents' age and health characterize Genetics, I.e., *Shuddha Shukra* and *Artava*.

Pre-conception care: Performing *Putra Kameshti Yajna*, Intake of *Vrishya Dravyas*, Parent's diet, Mother's psychology during menses, Parent's psychology during intercourse, Specific time and method of conjugating plays a significant role in modulating the genetics of the progeny.

Antenatal care (*Garbhini Paricharya*): Practicing *Pumsavana Karma, Matru Ahara* (diet of women during pregnancy), *Matru Vihara* (mode of life during pregnancy), and Psychological status during pregnancy, taking care of *Garbha-upaghatakara bhava*'s aids in a healthy pregnancy. It is crucial to adhere to correct *Matru Ahara* and *Vihara*. Improper *Ahara* affects *Rasaja bhava*, which results in *Garbha Vikriti*. To maintain a healthy pregnancy, one must consume *Garbha sansthapaka dravyas*, i.e., the *Dravyas* beneficial for the maintenance of pregnancy like *Aindri* (Bacopa monnieri), *Brahmi* (Centella asiatica), *Shatavari* (Asparagus racemosus), *Sahashravirya* (Cynodon dactylon) and drugs of *Jeevaneeya gana* and abstain from *Garbha upaghatakara bhavas*, i.e., activities and substances which are harmful to fetus like heavy exercises, coitus, harsh or violent activities, ride over vehicles, excess emaciation, sleeping in day and awakening in night, sitting in uneven places and should avoid fasting, grief, anger, visiting lonely places etc.

PROTOCOL FOR PREVENTATION OF GARBHANGA VIKRITI

Periconceptional care is an important measure to prevent *Garbhangavikriti* or teratogenicity. It maintains the equilibrium on the *dosha, dhatu* and *manas gunas* with the help of *shodhana* and food regimen. As there are increasing incidences of congenital anomalies due to faulty lifestyle changes, Ayurveda can contribute tremendously to effective pre-conceptual care and antenatal care. The precautionary preconception care mentioned by Acharyas includes the selection of life Partners, i.e. *Atulyagotriya vivaha* and age of marriage as in consanguineous marriage carries recessive traits.[22]

Most vital organs will be produced during early embryonic development, and any insult during this time may result in anomalies. Diet explained that to remediate the *beejapushti* like *masha* (black gram) and *tila taila* is a rich source of folic acid required to prevent neural tube defects. *Ksheera*, or milk mentioned during *masanumasika garbhini paricharya*, is an important source of calcium. *Garbhini paricharya* contains omega-3 fatty acids, which are essential for brain development.

Different body parts differentiate in the third month of pregnancy, and the heartbeat initiates with sensory and motor reactions. So Diet containing Milk with *Madhu, Ghrita* and *ksheera* is advised. Medicines like *Vrikshadani, Ksheera Kakoli, Priyangu, Sariva*, sugar, *Nagakesara* milk, and Sandalwood powder are prescribed.

In the Sixth month of pregnancy, *Meda Dhatu* is formed. Fatty tissues of *Garbha* are formed. *Bala*, *Varna*, and *Buddhi* are developed. As *medo dhatu* plays an important role in acro-renal disorders, a diet prepared from *Ghrita* and milk medicated with *Madhura* drugs, *Ghrita* or rice gruel medicated with *Gokshura* should be incorporated by *Garbhini*.

Medicine like *Prishniparni* (Uraria picta), *Bala, Gokharu*, Drum stick, Jeshtamadhu decoction. *Balya dravya* (Strengthening) *Endri, Vidarikanda, Shatavari, Ashwagandha, Mashaparni, Bala, Atibala, Swamridu Abhyanga with Bala/Tila Taila, Varnya*(for complexion) *Chandana, Padma, Ushira, Sariva, Jeshtamadhu, Manjishta, Shweta Durva, Vidarikanda. Medhya dravya Shankhapushpi / Brahmi Churna* are described by Ancient *Acharyas.*

The advice to use milk constantly for 9 months, particularly the first 3 months, emphasizes supplementing the essential nutrients. Milk is considered the best *Jeevaneeya Dravya*. It contains a lot of fat, lactose, and calcium. Because lipids are necessary to absorb vitamins A, D, E, and other nutrients, using butter and ghee is also justifiable. Ghee increases the child's intellectual capacity, nourishes the fetus, and suppresses the *Vata* of pregnant women. So, by incorporating diets prescribed in *Garbhini paricharya*, acro-renal syndromes can be prevented as this diet

regimen contains a rich source of calcium, folic acid and omega-3 fatty acids.

DISCUSSION

Polydactyly in neonates is often associated with renal, cardiac, and genital malformations in offspring of consanguineous parents. Polydactyly is an autosomal dominant disorder linked to defects in genes localised to chromosome no. 2. Renal involvement is observed in most of the affected offspring. It consists of structural and functional abnormalities such as posterior urethral valve, hydronephrosis, and renal failure.

It is proposed that *Medo dushti* and *kha vaigunya* in *pakwashaya* by vitiated *vata dosha* plays a significant role in the *Garbhanga vikriti* of acro-renal disorders. This correlation and understanding of the process of *Masanumasika garbhavriddhi* will improve the experience and communication between Ayurveda and current medical systems and lead to better integration of both sciences and management of acro-renal disorders. Also, proper care through the preconception and during the conception, as mentioned in Ayurvda, prevents malformations and provides stronger and healthier *Shreyasipraja (*good progeny*)*.

Dietary regimen, as mentioned in Ayurvedic texts, is scientific and applied. *Navneeta* advised that in the first month of gestation, it is a rich source of vitamins such as A, D, E, and K and minerals such as zinc and iodine. Zinc plays a significant role in cellular division and nucleic acid formation, which reduces the occurrence of spontaneous abortions and congenital anomalies in the fetus. Zinc deficiency increases the chances of malformations of the heart, brain, urogenital and skeletal system. Abnormal synthesis of nucleic acids and protein, impaired cellular growth and morphogenesis, which results in chromosomal defects, seems to cause these malformations.

Acharya Harita has prescribed *Ksheera*, a special formulation of rice for the pregnancy diet. *Ksheera*, comprised of *Guru Guna* and *Prithvi mahabhuta*, may help form organs such as *Hasta, Pada* and *Shira*. It acts upon the excretory system as it is *Malamutrakari* (repellent of faecal and urine).[23]

Ksheera, Ghrita and drugs of *Madhura gana* have been advised in the entire pregnancy period. Milk (*Ksheera*) is a wholesome diet throughout human life as it provides the required amount of essential nutrients and proper nourishment for the growth of the fetus. The abundance of proteins, amino acids and fatty acids in milk helps develop the baby's nervous system. Milk is rich in many vitamins required for intrauterine fetal development.

Reliable data hints that an ideal diet, as described by Acharyas, lowers the chances of failed pregnancies and severe congenital deformities if incorporated well before conception. Supplementing women's diets with vitamins, minerals, and, specifically, folate in preconception and throughout gestation decreases the incidence of neural tube defects and other congenital anomalies.

Early diagnosis of such malformations may significantly improve the quality of medical care provided to these infants and may increase their survival rate.

LEARNING POINTS:

It is important to be aware of these syndromes as they are very rare, and it's essential to look for other abnormalities in a syndrome when suspected. As these disorders run in the families of subsequent generations, genetic tree mapping should be done to assess the severity of the disease, and awareness should be created about genetic counseling in consanguineous marriage. Basic principles of Ayurveda should be considered for preventing such disorders and promoting healthy progeny with proper ANC care.

CONCLUSION

Studying thoroughly the concept from Ayurvedic and modern literature, the conclusion drawn is that the presence of one congenital anomaly is an indirect indicator of abnormalities in the other systems. Early diagnosis and treatment of urological anomalies are important to improve the long-term renal prognosis. Evaluation is advocated for offspring with congenital skeletal deformities of extremities for coexisting renal anomalies. Parental counseling is important in the case of genetically determined syndromes.

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