



An Ayurvedic perspective on Phakka Roga - Correlating traditional knowledge with Rickets in children

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Kashyap Samhita is one of the important ancient Samhita of Kaumarbhritya. Kumara Bharana and Poshana, i.e., growth, development and nutrition of the child are the main objectives of Kaumarabhritya.[1] During Kumaravastha physical and mental development takes place. It consists of various nutritional disorders and Phakka Roga is one of the most important diseases happens in childhood period due to malnutrition as well as malabsorption and has been described only in Kashyap Samhita elaborately. Phakka is described as nutritional disorder where a child is unable to stand up or walk on his/ her feet even after 1 year of age.[2] In Ayurveda the symptoms of Phakka Vyadhi are similar to that of Rickets. Rickets is the disease of children caused by Vit D deficiency characterized by imperfect calcification, softening and distortion of bones typically results in bow legs.

Keywords: Bharana, Poshana, Phakka, Kaumarabhritya, Rickets

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Introduction

Kashyapa says, in a normal child, one year of age is the maximum time to attain milestone of walking enabling the child to walk few independent steps. Child failing to attain the same, with delayed motor developmental milestones by one year due to various causes should be considered as victim of *Phakka*. *Phakka* disease is classified under *Kuposhanajanya Vyadhi*. [3] A lack of adequate mineralization of growing bones results in rickets. [4] The term Rickets is derived from English word wrick (twist) and Greek word rachitis means excess of osteoid tissue. It causes the bones to become soft and weak which can lead to bone deformities. Rickets can cause bone pain, poor growth and deformity of the skeleton such as bow legs, curvature of the spine and thickening of the ankles, wrists and knees.

According to *Acharya Kashyapa*, *Phakka Roga* mainly classify into three groups on the basis of their causes as follows.

- *Kshiraja Phakka*
- *Garbhaja Phakka*
- *Vyadhija Phakka*.

1. *Kshiraja Phakka*[5] - It occurs due to *Kaphajstanya sevan* by the child (*Balak*) and child (*Balak*) become *Krusha*. *Phakka-Dugdha* which is vitiated with *Kapha dosha* causes obstruction in *Rasavaha Srotasa* and cause nutritional deficiency in a child resulting in to *Kshiraja Phakka Roga*.

2. *Garbhaja Phakka*[6] - When a nourishing Mother / *Dhatri* conceives during breast feeding period, causes deficient milk secretion. There is less nutritional content in milk which is required for growth and development of child. There by the *Balak* gets emaciated due to malnourishment. This condition gives rise to *Garbhaja Phakka*.

3. *Vyadhija Phakka*[7] - In *Vyadhija Phakka* child suffers from *Ksheenata of Mansa*, *Bal* becomes emaciated due to *Nij* and *Agantujadi Roga* (disease). Different *Nija Rogas* which arise due to *Dosha* vitiation, i.e., systemic disorders like different types of virulent infectious disorders causing fever, when occurs repeatedly are the causes of failure to thrive (*Jwaradhibhi*). Similarly, different *Agantuja Rogas* which arise due to environmental hazards like air, water, pollution, food poisoning, adulteration,

Chemical poisoning, allergic exposure, autoimmune disorders, academic stress, and different external and internal injuries like surgeries, in due course of time also leads to *Phakka*. In some diseases if proper care and treatment is not provided it leads to emaciation with improper formation of metabolites (*Rasa, Mamsa, Meda* and *Asthidhatu*), leading to severe malnourishment associated with weak limbs as well as deficit of subcutaneous fat from gluteal, chest and extremities, abdomen becomes protuberant, head and face becomes more dominant, wasting of muscles known as *Vyadhija Phakka*.

Methodology

According to *Ayurveda* pathophysiology of *Phakka Vyadhi*[8] *Hetusevan* causes *Kapha Dushta Stanapana*, reduced *Stanapana* or *Jwar* & other disease which leads to reduced *Poshakansh*, *Strotodushti* & *Dhatwagnim&ya* which again leads to *Rasadi Dhatu Dushti* & *Alpopachaya*. *Alpopachaya* of *Rasadi Dhatu* give rise to *Vataprakopa* & causes *Grahani Dushti* & *Agnim&ya*. *Agnimandya* is one of major causes of *Dhatu kshaya* & *Mala Vruddhi* which give rise to *Phakka Vyadhi*.

According to modern science etiology of rickets[9]

1. Nutritional rickets - (Most common type)
 - Vit D deficiency
 - Ca deficiency
 - Phosphate deficiency
2. Refractory/ resistant rickets -
 - Rickets that does not responds to usual treatment
 - Vitamin D dependent rickets
 - Hypophosphatemia rickets
 - Chronic kidney disease
 - Renal tubular acidosis
 - Oncogenic/ tumour induced

Result

Functions of Vitamin 'D'

1) Vitamin D is required for normal growth in Bone's is related to its role in calcium and phosphorus absorption and bone mineralization which is needed for bone development.

- 2) Vitamin D increases calcium and phosphorus absorption in intestine.
- 3) For reabsorption of phosphate by renal tubular cells and raise the level of phosphate in the blood.
- 4) In normal growth of bones, the bone forming cells appears as cartilage cells which degenerate and disappear (apoptosis) and calcium and phosphorus are deposited in vitamin D deficiency cartilage cell do not degenerate but continue the grow.
- 5) For regulation of immune system.
- 6) Stimulation of cell differentiation.

Metabolic Changes in Rickets[10]

- 1) Vit D Deficiency leads to decreased calcium and phosphate absorption from intestine which leads to decreased level of calcium and phosphate.
- 2) Compensatory mechanism by parathyroid hormone (PTH) causes a) Reduced calcium excretion by kidney b) Calcium released from bones c) Decreased Renal tubular reabsorption of phosphate.
- 3) Sr calcium returns to normal but phosphate level falls.
- 4) There is Prolonged vit D deficiency. Even PTH cannot sustained its action.
- 5) Sr calcium and phosphate both levels decrease and there is Increased osteoblastic activity.

Important changes in Rickets[11]

▪ General

- 1) Failure to thrive
- 2) Protruded abdomen
- 3) Increase risk of respiratory infection
- 4) Increase risk of fracture
- 5) Pot -belly due to hypotonia of abdominal muscle

▪ Craniofacial changes

- 1) Craniotables
- 2) Frontal and parietal bossing
- 3) Large anterior fontanel and delayed closure of anterior fontanel.
- 4) Delayed dentition and dental caries

Thoracic changes

- 1) Rachitic rosary: Beading of costochondral junctions.
- 2) Harrison sulcus: A groove / depression along the lower costal margins.
- 3) Sternal Deformities like pectus excavatum i.e., depression of sternum.
- 4) Pigeon - Chest deformity.

Limb Deformities

- 1) Widening of wrist ankles due to widened epiphysis and metaphysis
- 2) Knock-Knee, Bow legs and Coxa -Vera.
- 3) Green stick pathological fractures of long bones
- 4) Double malleolus

▪ Hypocalcaemia

- 1) Tetany
- 2) Seizures
- 3) Stridor due to laryngospasm
- 4) Trousseau sign
- 5) Chvostek sign

Diagnosis

1. Ca
2. P
3. Alkaline phosphate
4. 25(OH) Vitamin D3
5. 1,25(OH)₂ Vitamin D3
6. X-ray wrist or knee - Fraying, splaying, cupping

Discussion

Treatment of Phakka (According to Ayurveda)

[12] - In the management of *Phakka Roga Prakruta Rasa Nirmana* is very important by improvement in *Agni* with the help of *Mrudu Shodhana (Udavartanam)* followed by *Deepan, Pachana, Bruhana* therapy. Oral use of *Amruta Ghrita, Kalyanaka Ghrita, Shatpala Ghrita* for 7 days for *Snehana* followed by *Shodhana* with *Trivrutt Ksheeram* or *Rasna, Yashtimadhu, Punarnava, Akpani, Arand, Sauf, Draksha, Trivrutta Siddha Dugdha* which pacify *Vata Dosha* and *Mamsa*. After *Shodhana Bramhi Ghrit Sevana* this will cause *Agnideepan* and *Strotaobala*.

A. *Abhyantarchikitsa* - 1) Orally use of *Kalyanakghrita*, [13] *Shatpalghrita, Amrutaghrita, Sanvardhanghrita*. [14] 2) *Asthiposhak Vati, Kukkutandatwak Bhasma*, Liq 3) *Shalitandul* with *Aushadh Siddha Dugdha, Mansa, Yush* 4) *Deepan* and *Pachandravya* like; *Rasana, Madhukasidhaghrita, Draksha, Punarnava*, milk for *Bruhankarma*. 5) *Sudhavarga Aushadhi Dravyas* are helpful for nourishment of *Asthidhatu*.

B. *Bahyachikitsa* [15] - *Basti, Snehapana, Swedana, Stroto Shodhana (Udavartanam), Shamana* play significant relief in the management of *Vatanubandha disease*.

1. *Sarvang Snehana*: By *Bala tail/ Chandanbalalakshadi Tail/ Raj Tail/ Narayan Tail*
2. *Sarvang Swedan* a) *Bashpa Swedan* with *Dashmulbharad Churna*. b) *Nadi Sweda* with *Vataghna Dravya* c) *Swedan* with *Shalishastik Pindasweda*.
3. Physiotherapy and use of *Phakka Ratha* For prevention of *Phakka Roga* *Ayurveda* has suggested *Nashya, Dhuma, Gandush, Pradeha, Parisheka* and *Kaphashamaka Dhara*.^[16]

Treatment of Rickets (According to Modern science)^[17,18]

- A) Neonate and infant - Administration of vitamin D 2000 IU/Day and 1 to 18 years Administration of vitamin D 3000 to 6000 IU/Day minimum for 3 months along with oral calcium supplement 30 -75 mg/kg/day for 2 months OR
- B) Stoss method - Infants more than 3 months-60,000 IU weekly for 6 weeks along with calcium supplement (By 4 weeks shows radiological line of healing) OR
- C) Vit D is administered orally either in a single dose of 600,000 IU or over 10 days (60,000IU daily for 10 days) followed by a maintenance dose of 400-800IU/day and oral calcium supplement 30 -75 mg/kg/day for 2 months.
- D) Expose the child to the sunrays in morning hours for about 15-20 minutes. Human skin contains provitamin which gets activated and synthesized on exposure to sun. This promotes the absorption of calcium and phosphorus by the body which makes the bone grow stronger.
- E) Include whole grains and beans like oats, Barley, Rice, Black beans, Lentils, etc. in the diet regularly
- F) Consume more of green leafy vegetables like Spinach, Methi, etc.
- G) Consume dry fruits like Almond, Walnuts, Cashews, Raisins in diet
- H) Include fresh fruits like Oranges, Figs, Bananas, etc. in daily diet

Conclusion

According to modern science Rickets is a condition where the bones in the children become soft and weakened due vitamin D deficiency. In *Ayurveda* symptoms of rickets are similar to *Phakka Vyadhi* and it is said to be a nutritional disorder but *Phakka* which is mentioned by *Kashyapa* is definitely not limited to a single disease.

The clinical presentation of *Phakka* contribute nutritional and metabolic disorders like, mal nutritional, mal absorption disorders and different inborn and acquired errors of the metabolism and conditions like Cerebral palsy, protein energy malnutrition, skeletal deformities, rickets, tuberculosis like infectious disorders, muscular dystrophies, endocrinal metabolic errors, all ends-up as a condition of *Phakka* causing failure to thrive.

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