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REVIEW OF *PHAKKA ROGA* IN CHILDREN AS A BROADSPECTRUM DISORDER; SPECIFIC CONTRIBUTION FROM KASYAPA SAMHITA

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ABSTRACT

Introduction: *Phakka Roga* in Ayurveda is a specific contribution from Kashyapa Samhita characterized by child's inability to walk on their feet after the age of one year. This motor disability is a frequent presentation in paediatric practice and represents a significant area for exploration in Ayurveda. **Background:** The single symptom of motor disability in *Phakka* encompasses a broad etio-pathological spectrum. While prevention of *Phakka* through dietary habituation suggests a nutritional disorder, but the condition also correlates with various diseases such as cerebral palsy, rickets, poliomyelitis etc. **Objective**: Despite the chapter's incompleteness, this aims to extract the practical implications from the available resources and to gain in-depth understanding of the concept. **Method:** Analysing the relevant chapter and comparing the etio-pathophysiology of *Phakka* with that of other conditions to minimize discrepancies and to give a comprehensive perspective on the disease. **Result**: Three types of *Phakka* i.e. *Kshiraja, Garbhaja,* and *Vyadhija* are discussed in terms of etiology, symptoms and treatment are considered as subsequent higher degree of symptoms. These corresponds to protein-energy malnutrition i.e. marasmus, kwashiorkor, and marasmic-kwashiorkor. *Vyadhija Phakka* is proposed either as a single disease representing the neurological sequelae of malnutrition or as a broad umbrella term encompassing multiple disorders.

KEYWORDS: Kwashiorkor, Marasmus, Malnutrition, neurological defect, *Phakkaroga in* children.

INTRODUCTION

Adequate nutrition is fundamental for the growth, development, immunity and health specifically during childhood. Nutritional inadequacy leads to undernutrition, cognitive impairment, recurrent infections, morbidity and mortality. It can affect the education of child and adult productivity as well. Proper assessment of the nutritional status and associated comorbidities are key indicator of child health. *Phakka* is a specific contribution from Kashyapa Samhita where the child not able to walk with feet after 1 year of age and it is of 3 types *Kshiraja, Garbhaja*, and *Vyadhija*. Based on the severity of symptoms this can be graded in ascending order. *Phakka* is a disease classified under *Kuposhanajanya Vyadhi* (malnutrition). Unlike the contemporary science where the concept of breastmilk vitiation does not exist, *Phakka* can arise due to vitiated breastmilk. The etiological factors that cause *Phakka* are *Kapha* vitiated milk, subsequent pregnancy, and secondary to disease in which underlying immune compromisation leads to malnutrition and neuromuscular impairment.

MATERIALS AND METHODS

Qualitative textual analysis and comparative review integrating classical Ayurvedic literature in terms of *Phakka* in relation to nutritional disorders with neurological association was undertaken. Primary emphasis was on Kashyapa Samhita along with relevant data from authentic online database.

Kshiraja Phakka

A *Kshirapa* (an infant dependent on breastmilk), adapted to *Kapha*-vitiated milk, becomes susceptible to *Bahu Vyadhi* (multiple diseases). Such a child often becomes undernourished, eventually leading to a condition known as *Phakka*.[1] The treatment includes the purification of breastmilk, ensuring the adequacy and quality. Since nutritional deficiency in this context arises in the early phases of life, it can be correlated with marasmus, which typically manifests shortly after birth/ during the infantile period. Based on the severity of symptoms and the scope of intervention, this presentation may be considered as the first grade of *Phakka*. A similar condition, *Balasosha* occurs when *Kapha*-vitiated breastmilk obstructs the channels of *Rasa Dhatu* (first tissue fluid), leading to a biphasic manifestation. Initial symptoms such as *Arocaka* (anorexia), *Pratishyaya* (common cold), *Jwara* (fever), and *Kasa* (cough), gradually leads to emaciation.[2] Treatment in such cases focuses on *Agni Deepana*

(enhancing the digestive power), *Sroto Shodhana* (clearing obstructed channels), and managing undernutrition. These can be correlated with the clinical scenarios including recurrent respiratory tract infections and gastrointestinal disturbances, which progressively contribute to undernutrition in children.

Garbhaja Phakka

The second variety of *Phakka*, known as *Garbhaja* is attributed to the early cessation of breastfeeding due to the mother's subsequent pregnancy. In this condition, non-adaptation to new nutritional environment leads to often progressive emaciation and, in severe cases even death. Unlike the first variety, where the infant is exclusively breastfed, here the affected child is typically a toddler, as implied by the etiology. Therefore, the child is not solely dependent on breastmilk for nutrition. The symptoms indicate an advanced/ higher grade of *Phakka*. In such cases, treating the mother alone is not applicable; instead, the primary focus is on providing supplementary nutrition directly to the child. A comparable condition is *Parigarbhika*, where child suffers from symptoms such as *Kasa* (cough), *Agnisada* (impaired digestive power), *Vamadhu* (vomiting), *Tandra* (generalized weakness), *Arocaka* (loss of appetite), *Bhrama* (giddiness), and *Koshta Vṛiddhi* (abdominal distension).[3] Kwashiorkor, often described as 'the sickness the baby gets when the new baby comes' or 'the disease of the deposed child' can be correlated.[4] It reflects the clinical picture of an older child who develops protein-energy malnutrition after abrupt weaning due to the arrival of a younger sibling.

***Vyadhija Phakka* (Secondary to disease): Broad spectrum aspect**

This can be considered as third grade of *Phakka* by considering the symptoms and sequelae. It is a severe progressive condition with malnourishment associated with motor disability.

Different stages of presentation

- **Origin**: Endogenous/ exogenous/ acquired
- **Predisposing risk factor**: Child who is neglected/ unprotected
- **Clinical presentation**

Emaciated and immune compromised child with wasting of gluteal, arm and thigh muscles, abdominal distension, dominant skull, face/facial puffiness associated with scleral icterus, horripilation, and looks like skeletal body.

Weakness of lower limbs along with the anal sphincter or Complete paralysis of lower limbs

that make the child to crawl with hand and knee

↓

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↓

Above conditions i.e. general weakness and non- ambulation exposes the child to different infestations brings the child close to death with vital disturbances

↓

These infestation results in foul smell from skin appendages like hair, nails, sweat glands. Excess excretory products from external orifices also contribute to this condition.

Hampered digestive power specifically in child who are not supported and psychologically deprived, though have adequate intake of food also affected with *Phakka* as there is no qualitative absorption but excess formation of urine and stool. It is the third grading of *Phakka* with greater disability, deterioration which require stepwise treatment. Unlike the former here the prime focus is the child, who is not under protection. Combination of symptoms of marasmic- kwarshiorkor are associated with this.

Management of *Phakka*

Internal therapy: *Sodhana* (purification therapy), *Samana* (palliative therapy), and *Pathya* (dietary modification) are beneficial in the management of *Phakka*. Medicated ghee such as *Kalyanaka Ghrita*, *Satpala Ghrita*, or *Amrita Ghrita*, may be administered for seven nights, followed by purgation with *Trivrt*-mixed milk. Once the *Srotas* (bodily channels) are cleared, secondary palliative therapies may be initiated. *Brahmi Ghrita* and milk medicated with *Pippali*, *Rasna*, *Madhuka*, *Punarnava*, *Ekaparni*, *Eranda*, *Satapushpa*, *Drakṣa*, *Pilu*, or *Trivrt* can be used based on the clinical presentation. *Dosha*-specific treatments should be adopted. If *Kapha* is associated then milk mixed with urine is advised. When combination of *Dosha* is present, particularly with *Vata*, therapies such as *Basti* (medicated enema), *Snehapana* (internal oleation), *Svedana* (sudation), and *Udvartana* (powder massage) similar in *Vata Vyadhi Chikitsa* are adopted. In diet, medicated ghee, oils, milk, vegetable soups, and meat soups may be included as energy supplements. Regular intake of a wholesome and congenial diet helps cure *Phakka*.

External therapy: *Raja Taila* mentioned specifically for management of *Phakka*.[5] It helps to relieve *Pangu* (lameness), and supports the development of motor functions, longevity, and physical strength in the child.

Supportive therapy: For disability management, as physiotherapy mobility aids such as wheeled walkers can provide supportive assistance to improve the child's independence and functionality.

Table 1: Grading of *Phakka* according to severity.

Grade	Type	Manifestation	Management
Grade 1	*Kshiraja Phakka*	Occurrence of many diseases. *Karshya* is the outcome	Nutritional inadequacy. Treatment to mother for breastmilk vitiation
Grade 2	*Garbhaja Phakka*	*Kshaya* (emaciation) / Death if severe	Breast milk inadequacy. Additional supplementation can be prioritized.
Grade 3	*Vyadhija Phakka*	Deteriorating condition with multiple neurological sequelae and vital disturbances.	Disease specific, stepwise treatment

RESULT

Instead of correlating the *Phakkaroga* to isolated conditions like Rickets, Protein energy malnutrition, poliomyelitis based on selected symptoms this can be considered as a nutritional disorder that leads to progressive emaciation and secondly as an umbrella term which include multiple disorders. Before initiation of treatment, the assessment of *Phakka* can be done to differentiate the nutritional and neurological associations.

DISCUSSION

1. *Phakka* as single nutritional disease

Marasmus, a form of protein-energy malnutrition in infants characterized by wasting of muscle, subcutaneous fat, irritability, and profound weakness, often rendering the child unable to sit or walk without support.[6] *Kshiraja Phakka* is seen in younger infant. In *Garbhaja Phakka/Parigarbhika* which is similar to Kwashiorkor (protein-energy malnutrition with oedema), shows hypoalbuminemia, irritability, anorexia, and occasionally apathy.[7] Although oedema may mask the actual weight loss, muscle wasting leads to weakness and delayed motor skills.[8] The symptoms of *Vyadhija Phakka* closely resemble the classic presentation of marasmic-kwashiorkor, and are directly linked to Severe Acute Malnutrition (SAM) with neurological deterioration. In Marasmus, there is *Sushka Sphik, Bahu, Uru* (extreme muscle atrophy, especially in the upper arms, thighs, and gluteal region), giving the outlook of an *Asthipanjara* (a skeletal appearance). *Maha Sira* (prominent skull) is noted where the head appears disproportionately large compared to the body. Other features include weakness, lethargy, and reduced mobility, which progresses to crawling using hands and

knees. In Kwashiorkor, *Mahodara* (abdominal distension) may occur due to ascites and fatty liver i.e. hepatomegaly with fatty infiltration, along with a *Mahamukha* (puffy moon face). Skin changes, such as peeling or flaking (crazy-paving or flaky-paint dermatoses) in friction areas, may become ulcerated or infected.[9] Hair changes include dry, sparse, brittle hair with alternating pale bands (flag sign), and easily pluckable. Nail changes are also common. This form of malnourishment may progress to lower limb paralysis and increased susceptibility to infestations *Makshika, Krimi, Keeṭa, Durgandhi, Malina* i.e. especially fly attraction like myiasis and infections. Thus, it presents as a condition with overlapping features of marasmic- kwashiorkor combining both nutritional and neurological deficits.

2. Association of sensory organ defects in *Phakka*- progression of malnutrition to neurological deficit

Vitiated breastmilk can cause neurological conditions such as *Pangu* (lameness), *Muka* (mutism), and *Jada* (mental dullness). When *Rasa Dhatu* is affected, it's roots *Koshta* (alimentary canal) and *Hridaya* (heart) are also afflicted. As the mind resides in *Hridaya* and governs the *Indriyas* (sensory faculties), any disturbance in this region leads to dysfunction of the *Indriyas* i.e. both *Jnanendriya* and *Karmendriya* (sensory & motor organs). This explains the pathophysiology of how vitiated breastmilk result in neurological impairments. Acharya Kasyapa have described the relationship between mutism and deafness. A child born deaf may become mute due to lack of exposure to language during early development. Besides congenital causes, the possibility of an acquired condition where mutism gradually progresses to hearing loss must be explored. Neurodegenerative/ progressive neurological conditions especially those affecting both the language centres and auditory pathways can lead to mutism followed by progressive sensorineural hearing loss. The conditions include Landau-Kleffner Syndrome (LKS), MPS II - Hunter Syndrome, Subacute Sclerosing Panencephalitis (SSPE), neurodegenerative disorders (e.g. Leukodystrophies like Metachromatic Leukodystrophy) and congenital Infections (e.g., CMV).[10,11,12,13,14]

3. *Phakka* as an umbrella term for multiple disorders

Jwara causes *Manda Ceshta, Niscesta & Pani Janu Gamana* (febrile disease that causes motor disability): Several febrile illnesses in children like viral encephalitis, bacterial meningitis, cerebral malaria etc, can lead to motor disabilities due to central or peripheral nervous system involvement. Dengue, H1N1 also were common causes that can cause the injury.[15] Acute Necrotizing Encephalopathy of Childhood can follow viral infection,

characterized by acute onset and rapidly progressive encephalopathy.[16] Landry Guillain Barre Syndrome is an acute, immune-mediated polyradiculoneuropathy that can cause ascending symmetrical weakness.[17] In children, the acute motor axonal neuropathy often associated with more severe disease. Multisystem Inflammatory Syndrome in children is a rare but serious condition that can affect multiple organ systems and neurological manifestations may include encephalopathy, peripheral neuropathy leading to motor disabilities.[18] Transverse myelitis can rarely follow a febrile illness and result in sudden bilateral limb weakness/paralysis (motor weakness), sensory impairment and autonomic dysfunction (e.g. incontinence) due to spinal cord inflammation.[19] Cerebral palsy is a non-progressive motor impairment from an acquired post febrile brain insult.[20]

Sushka Sphik, Bahu, Uru, Mahodara, Mahamukha- Muscle wasting in *Phakka*: There are acquired condition that can cause muscle wasting in buttocks arms and thighs and associated with abdominal distension and facial puffiness. Tropical pyomyositis which is primary skeletal muscle infection by *Staphylococcus aureus* affects large muscle groups, including the quadriceps, gluteal muscles, and iliopsoas.[21] Muscle wasting, abdominal distension and facial puffiness is a sign of systemic involvement in complicated cases of such Benign Acute Childhood Myositis (viral infection).[22] Kwashiorkor while not primarily a febrile condition, often follows infections such as diarrhoea or measles is characterized by muscle wasting, moon face, ascites and growth retardation.[23] Multi system inflammatory syndrome in children if associated with prolonged inflammation or organ involvement presents with persistent fever, abdominal pain, vomiting, diarrhoea, and muscle pain lead to muscle weakness and wasting. Facial puffiness and abdominal distension may result from systemic inflammation and fluid retention.[24,25]

Pitaksha - Scleral icterus: In children emaciation accompanied with scleral icterus indicates severe malnutrition with potential liver dysfunction. This combination suggests the underlying conditions such as kwashiorkor, marasmus, or liver-related diseases. Liver dysfunction in kwashiorkor can lead to conjugated hyperbilirubinemia, resulting in scleral icterus.[26] In marasmus, jaundice is not a hallmark feature, but severe cases can lead to liver dysfunction. Various liver diseases can cause both emaciation and jaundice in children such as hepatitis, biliary atresia, and cirrhosis. These conditions often present with hepatomegaly, ascites, and failure to thrive.

Pramlana Adhara Kaya, Niscesta and *Pani Janu Gamana*- Acquired conditions of

malnourishment associated with lower limb paralysis: Hypokalemia can occur in malnourished children, leading to acute flaccid paralysis. In severe cases, respiratory muscles can be involved, necessitating ventilatory support.[27] Children with marasmus may exhibit generalized muscle weakness, including the lower limbs. The condition is often associated with delayed developmental milestones and may present with hypotonia. Children with cerebral palsy often have feeding difficulties, leading to malnutrition and deficiencies in calcium, zinc, copper, and vitamin D being common. Malnutrition in CP can exacerbate muscle weakness and impair motor function.[28] Acute transverse myelitis is an inflammatory condition of the spinal cord that can lead to rapid-onset of lower limb weakness or paralysis.[29] While not directly related to malnutrition, it can occur in children with underlying nutritional deficiencies or weakened immune system. Acquired lower limb paralysis or weakness is seen in peripheral neuropathies and polyradiculopathies (Guillain Barre Syndrome, chronic inflammatory demyelinating polyneuropathy), spinal cord disorder (Acute Flaccid Myelitis, Acute Transverse Myelitis, Acute Disseminated Encephalomyelitis) neuromuscular and muscular disorders (myopathies) and other mimicking paralysis (poliomyelitis). Neuro muscular compromise could be exacerbated by vitamin D deficiency, electrolyte imbalance, or concomitant neuromuscular disease (e.g., spinal muscular atrophy), though primary malnutrition is most plausible here.

Seerna Roma, Stabdha Roma, Angaharsha, Mahanakha- Acquired malnourished condition associated with body hair loss, hair stiffness and horripilation: It can lead to various dermatological and systemic manifestations, including body hair loss, skin changes. These signs often reflect underlying deficiencies in essential nutrients such as vitamins A, B complex, E, and essential fatty acids. vitamin A deficiency cause Phrynoderma with clinical features sparse, brittle hair and horripilation.[30] Zinc deficiency can present with alopecia and horripilation.[31] Vitamin E deficiency can lead to Alopecia and dry, brittle hair Stiffness and muscle weakness, horripilation and peripheral neuropathy particularly in the lower limbs.[32] Kwashiorkor also associated with alopecia and dry, brittle hair, stiffness, muscle weakness and horripilation. Scurvy can manifest with alopecia and perifollicular haemorrhage, stiffness and muscle weakness. vitamin C deficiency causes corkscrew hairs and other dermatological signs that may indirectly affect nail appearance.[33] *Mahanakha* (Excessive nail growth) except in pachyonychia congenita is not a prominent feature of acquired malnutrition related conditions, but indirectly affect nail growth patterns. Nail changes that affect nail growth and integrity are seen in Acrodermatitis enteropathica (zinc deficiency), onychorrhexis

(longitudinal splitting) and onychoschizia (lamellar peeling).[34] In kwashiorkor, nail abnormalities such as thin, soft, fissured, and ridged nail plates are commonly observed. While excessive nail growth is not typical but the overall nail health is compromised. Iron deficiency can lead to nail changes affect nail growth patterns such as koilonychia (spoon-shaped nails).[35]

Mandaceshta, Makshika, Krimi, Keeta, Durgandhi, Malina, Asanna Mrityu **-** Flies, insects and worm infestation in non- ampulated child with bad odour: Necrotic tissue or odorous secretions from orifices attract fly larvae, leads to myiasis across various body sites. cutaneous myiasis with bedsores which emits *Durgandhi* (foul-smell). Foul smelling discharge from other sites such as oral myiasis, nasal myiasis, aural myiasis, intestinal myiasis are also seen. Myasis affects particularly in children with poor hygiene, immobility, neurological deficits or being bedridden and from low socioeconomic status similar to *Anatha* (orphan) in *Phakka.*[36]

There are other diseases to be included in differential diagnosis such as muscular dystrophies, DMD (no icterus or myiasis, and typically no facial puffiness), chronic liver disease in children (But would not explain lower limb weakness alone) spinal muscular atrophy (Profound lower limb weakness and motor regression but no puffy face, icterus, or myiasis), Parasitic/bacterial sepsis or TB with secondary malnutrition.

Assessment of nutritional and neurological causes

Clinically, differentiation of nutritional and neurologic cause is important in the diagnosis. A combined approach with anthropometrical measurement, clinical signs, developmental screening, feeding history are the specific areas that can be incorporated for the assessment. Anthropometry can differentiate the proportionate growth of nutritional cause and disproportionate growth in neurologic causes. Feeding history helps to assess the adequacy in nutritional cause and other feeding difficulty in neurologic causes. Severity, persistence, and improvement in milestones of developmental screening directs towards proper diagnosis. Neurological examination gives the association of neurological involvement, while at the level of management, the response to nutrition also differentiates the etiology.

CONCLUSION

Distinguish between malnutrition (marasmus/kwashiorkor/marasmic- kwashiorkor) and other neurologic/metabolic disease is crucial for the proper diagnosis of *Phakka* in the current

scenario. History of calorie intake, feeding habits, developmental milestones are to be evaluated thoroughly to avoid misdiagnosis. *Phakka* presents with varying etiologies, clinical features, and stages of progression, each requiring tailored therapeutic approaches; particularly in its advanced stages, there is a notable association between malnutrition and sensory organ defects, highlighting the progression from nutritional deficiency to neurological impairment. Deficiency in macro and micronutrients leads to motor and sensory disorders. Chronic undernutrition affects the nourishment of *Rasa Dhatu* (The first formed *Dhatu* which in other terms can be called as *Ahara Rasa* itself), which is the foundation for the development and maintenance of *Indriyas* (sensory organs viz. eyes, ear, nose, skin and tongue). This progression mirrors modern medical understanding where prolonged malnutrition leads to atrophy of brain tissues, delayed myelination, and impaired neurotransmission. These changes can result in neurodevelopmental delays, mutism, auditory processing disorders, and other associated complaints. Hence, *Phakka* should not be viewed merely as a nutritional disorder but rather as a systemic condition progressing with profound neurological and sensory implications. Early identification and comprehensive intervention are crucial to prevent irreversible sensory and cognitive deficits.

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