WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES
SJIF Impact Factor 7.421
Volume 7, Issue 12, 553-567 Review Article ISSN 2278 – 4357

BALASOSHA IN RELATION TO PROTEIN ENERGY MALNUTRITION

Dr. Sangita Prusty*[1], Prof. K. B. Mahapatra[2] and Dr. Ajit Kumar Shasamal[3]

[1]PhD. Scholar and Lecturer in Department of Kaumarabhritya, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha.

[2]Professor & Head of the Department of Prasutitantra and Streeroga P.S.L. Ay. Medical College Ratlam M. P. India.

[3]Reader in Shalyatantra at Sri Babu Singh Jay Singh Ayurvedic Medical College & Hospital, Farukhabad, U. P.

Article Received on
05 October 2018,

Revised on 25 October 2018,
Accepted on 15 Nov. 2018,

DOI: 10.20959/wjpps201812-12791

***Corresponding Author**
Dr. Sangita Prusty
PhD. Scholar and Lecturer in Department of Kaumarabhritya, Gopabandhu Ayurveda Mahavidyalaya, Puri, Odisha.

ABSTRACT

The word *Balasosha* is made up of two words *'Bala'* and '*Sosha*' means 'Emaciation of child'. According to description available in Ayurvedic texts this emaciation is originated from nutritional deficiency states in children, which is called as protein energy malnutrition in modern science. Although exact correlation of *Balasosha* with any specific disease of modern medicine is not possible but keeping in view of the various clinical signs and symptoms of P.E.M, it can be equated with *Balasosha* to some extent.

KEYWORDS: Balasosha, PEM, Shuskata.

INTRODUCTION

In the disease *Balasosha* which is described in only Ayurvedic text A.H.U 2/50 and is a disease limits only to child age group but when the term Sosha comes it is described in various Ayurvedic textual in various contexts means the texts 'Rajajakhma', 'Krushata' etc. But Balasosha is limiting one with symptoms of 'emaciation of body with the symptoms of Arochaka (Loss of appetite), pratishyaya (Rhinitis) Jwara (Fever), Kasa (Cough), Paleness of face and eye. The condition occurs due to obstruction of increased Kaphadosha due to more daytime sleep, more consumption of cold water, consumption of sleshmadosha yukta stanya, in rasavaha srotas and improper or sluggishness of poshana of uttaratora dhatus. So emaciation and also kapha has the property to sluggish agni, so there is loss of power of agni,

so loss of appetite and agni also losses its power of simplification of saptadhatu assimilating mahabhutas as there is also sluggishness of dhatwagni.

The disease itself is demarcated as a degenerating disease. Although there are much more detorianation disorders like Parigarbhika, Phakka, Rajajakhma. Considering the cause and symptoms it is some extent comparable with PEM. In PEM there is improper nutrition supplementation due to different causes like poverty, poor socioeconomic status, illiteracy or low educational level of parents, maternal ignorance, faulty food habit, early or late weaning, large family, low birth spacing, unequal distribution of food in family, unemployment, long term disease etc. There are symptoms like low weight gain started with following growth retardation and associated symptomatic infective disease and loss of immunity. Lastly the child goes to becomes more detorianation and lastly morbid. But Pediatric health status is the real reflection of the health status of a civilized and healthy nation. 2/3rd of Pediatric society suffers from different grades of ratio of PEM. So Unicef states that if India wants to relieve its intellectual capacities, it needs to work in this area much strongly. So we should impact upon the herbal remedies which can impact on proportion of growth ability, all infective diseases, increasing immunity and also increasing appetite with the available herbal drug with proper diet supplementation to increase health status of India.

Definition of Protein Energy Malnutrition (Pem)

WHO defined Protein Energy Malnutrition as range of pathological conditions arising from coincidental lack in varying proportions of proteins and calories, occurring most frequently in infants and young children and commonly associated with infection.

There is a varying extent of weight loss and growth retardation with the severity of PEM i.e. in the early stages; there is loss of weight associated with loss of subcutaneous fact and muscle mass with dysfunction of many vital organs which lead to a variety of clinical features with increasing severity, there is increasing failure in the homeostatic mechanisms of the body and damage to the immune defences which may result in infections, shock and death.

Etiology of Pem

Indivisual factors like bad start with low birth weight and baby born from malnutrished mother, Family factors like bad economy or poverty that is inability to pay for adequate food, ignorance of period of weaning from breast milk, faulty food habits and feeding, large

family, maternal illeteracey. Community factors like National poverty, poor educational status, cultural practice and belifs, natural and man made disasters like poor agricultural or harvest practices, poor rainfall or excess rain, poor facilities for storage and transport causes primary malnutrition.

Intestinal mal absorption and parasitic infections, Tuberculosis, Diabetes, metabolic disorders cause secondary malnutrition.

Classification

PEM is a generalized syndrome complain.It is classified according to the severity, course and relative contribution of energy or protein deficit causing anthropometric clinical and biochemical parameters.

(1) WHO/FAO Expert Committee Classification

Nutritional status	Body weight as % standard for age	Edema	Deficit in weight for height
Underweight	80 – 60	0	Minimal
Nutritional dwarfism	< 60	0	Minimal
Marasmus	< 60	0	++
Kwashiorkor	80 – 60	+/++	+/++
Marasmic kwashiorkor	< 60	+	++

(2) IAP Classification

Nutritional Grade	Percentage of standard weight for age
Normal	More than 80 percent
Grade – I	71 – 80%
Grade – II	61 – 70%
Grade – III	51 – 60%
Grade – IV	< 50% or less
Add (K) for presence of edema.	

(3) Welcome Trust or International Classification

Clinical types of PEM	Weight for age (% of expected)	Edema
Underweight or Under nutrition	< 80	Absent
Kwashiorkor	60 – 80	Present
Marasmus	< 60	Absent
Marasmic Kwashiorkor	< 60	Present

(4) Classification Based on NCHS Standard

Indices	Nomenclature for deficit of Index	Cut-off defining % of reference median	Points for malnutrition on Z or SD score from ref. median
Weight for age	Underweight	< 80	< - 2
Height for age	Stunting	< 90	< - 2
Weight for height	Wasting	< 80	< - 2

(5) Gomez's Classification

Weight of the child	Grade
90-110% of standard	Normal
75-90% of standard	1st degree malnutrition (mild)
60-74% of standard	2nd degree malnutrition (moderate)
Less than 60% of standard	3rd degree malnutrition (severe)

(6) Jellife's Classification

Nutritional Grade age	Percentage of standard weight for
(50th percentile of Havard standard)	
Normal	More than 90 percent
Grade – I	80 – 90 percent
Grade – II	70 – 79 percent
Grade – III	60 – 69 percent
Grade – IV	Less than 60 percent

(7) Water Low Classification

	Normal	Wasted	Stunted
Weight/Age (%)	100	70	70
Weight/Height (%)	100	70	100
Height/Age (%)	100	100	84

(8) Arnold's Classification

(Based on mid arm circumference – MAC) or (Mid upper arm Circumference – MUAC)

Nutritional Status	MAC (cm)
a. Normal	13.5 and above
b. Mild to moderate PEM	12.5 – 13.4
c. Severe PEM	12.4 or less

(9) Interpretation of Indicators

Nutritional	Stunting % of	Wasting % of
Status	Height/Age	Weight/Height
Normal	> 95	> 90
Mildly impaired	87.5 – 95	80 – 90
Moderately impaired	80 – 87.5	70 – 80
Severely impaired	< 80	< 70

(10) Syndromal Classification

- Kwashiorkor
- Nutritional marasmus
- Marasmic Kwashiorkor
- Pre-kwashiorkor
- Nutritional dwarfism

Clinical Features

About two thirds of children with PEM do not present with clinical signs and are diagnosed by anthropometry. But children with longstanding nutritional deprivation fail to develop normally. They may develop any of the following manifestations – depigmented, lusterless, easily pluckable hair, Glossitis, stomatitis, gingivitis, pallor, thin lustreless skin, wasting, edema, vitamin A deficiency, rickets, parotid enlargement etc. Skull circumference gets arrested. These children may manifest as marasmus, kwashiorkor, marasmic kwashiorkor and nutritional dwarfism.

Marasmus

It occurs usually in subjects less than 3 years of age. It can develop in the first months of life and will result, if mother's milk supply is insufficient, as a result of which the mother feeds the baby with diluted buffalo's, cow's, goat or even tin milk and very little or no other food is offered. Hence common age of occurrence is 0 to 2 years but the peak incidence is seen during the first year of life.

Sign and symptoms

- Gross wasting of muscle and subcutaneous tissues resulting in emaciation, marked stunting and no edema,
- The body weight is less than 60 percent of the expected weight for the age.
- Height is also affected though to a lesser extent.
- Fat in the adipose tissues is severely depleted because it is used up for providing energy.
- Contour of atrophic muscles is evident under the thin and wrinkled skin. Loose fold of skin are prominent over the glutei and the inner side of thigh.
- Buccal pad of fat is preserved till the malnutrition becomes extreme. A higher proportion of saturated fatty acids is stored there and the saturated fat is the last to be depleted.
- Skin appears dry, scaly and inelastic and is prove to be infected.

- Hair is hypopigmented.
- Abdomen is distended due to wasting and hypotonia of abdominal wall muscles.
- Mid arm circumference is reduced.
- The bony points appear unduly prominent due to emaciation.
- The baby appears alert, but is often irritable.
- Children may show voracious appetite.
- In the early stages the child is irritable, hungry and craves for food but in the later stages he may become miserable and apathetic, refusing to take anything.
- Diarrhoea, mineral and vitamin deficiencies, superated infections and parasitic infestations are commonly seen.
- Face is wizened and shrivelled just as in the case of monkey.
- Head appears disproportionately large with very little hair and it cut does not grow back easily.
- Ribs are visible and the costochondral junctions look prominent because of loss of subcutaneous tissue.
- Child is conscious, alert but apathetic.
- Facial pads of fat are last to go and when that happens, the child looks like a wizened old man.
- Usually there is moderate anaemia, but may be associated with vitamin deficiencies, infections and infestations and electrolyte imbalance with diarrhoeal instances.

Kwashiorkor

The word "Kwashiorkor" is an African word which means "the disease that occurs when the child is displaced from the breast by another child". The age incidence of Kwashiorkor is later than that of marasmus and this condition is uncommon under the age of 1 year. A vast majority of the cases are in 1 to 4 years age group. No age is however exempt. Occasionally it may be seen in infants aged few months, in adolescents and even in adults.

Sign and symptoms

- A classical case of Kwashiorkor is dull, apathetic and miserable, evincing hardly any interest in the surroundings. His growth is stunted and there is marked muscle wasting with some retention of subcutaneous fat.
- Pitting oedema over the legs and feet and perhaps over certain other parts of the body.
- There may be diarrhoea, skin and hair changes, anaemia and vitamin deficiency signs.

- Liver is as a rule enlarged due to fatty changes.

Marasmic Kwashiorkor

Marasmic kwashiorkor refers to cases demonstrating a combination of features of kwashiorkor and marasmus. Presence of edema is essential for this diagnosis. Children with severe muscle and fat wasting, but with presence of edema are called as "marasmic kwashiorkor". This syndrome is seen in children with those who have marasmus, but suddenly develop edema due to increased deficiency of protein than before.

Nutritional Dwarfism

If PEM starts fairly early in life and goes on and on over a number of years without causing overt picture of kwashiorkor or marasmus, child's height as well as weight may be significantly low for his age is called as nutritional dwarfism.

Management of Pem

Management of PEM depends on

- Nutritional status
- Degree of hypermetabolism
- Expected duration of illness
- Associated complications

The goals are

- To minimise weight loss
- To maintain body mass
- To encourage body mass repletion or growth.

Principles of management are

1. The patient is evaluated with regard to

- The severity of PEM
- Presence or absence of associated systematic infections
- Associated nutritional deficits such as vitamin deficiencies or anaemia and associated fluid and electrolyte disturbances

2. The intake of food is promoted by all available means. Locally available and culturally acceptable foods which the family can afford are advised.

3. Complications of malnutrition sequel and death are prevented by careful surveillance and prompt remedial action.
4. Possible epidemiological factors for malnutrition are considered and attempt is made to eliminate these as far as possible.

Mild to moderate PEM is best managed at home. Majority of cases of severe PEM are associated with some of the complications listed above and hence be best managed in hospital.

Concept of Balashosa

The disease Balashosa is not described in any old available text book of Ayurvedic literature. Vagbhatta is the first person to use the term balashosa and has described it in his books Astangasangraha and Astangahridaya. Other authors have discussed it under other headings like Charaka and Sushruta called it "shosha" and "Krusha", Sharangadhara named it "Gatrashosha" and "Dourbalya" and Yogaratnakara termed it "karshyaroga" etc. Similarly the causes and symptoms of parigarbhika, shuskarevati, ksheeralasaka and phakka roga also resembles the Balashosha.

Balashosha is a common disease in every part of our country. It is known by different name e.g. "Sukharoga" "Sukhandi", and "masana" etc.

Bala

There are slight different views of different Acharyas regarding to the upper limit balyaavastha. Acharya charaka, shusruta, astanga sangrahakar and astanga hrudayakar told that balyavastha is up to 16 years but kashyap told that up to 1 year or breastfeeding it is called as balyavastha.

Shosha

According to sushruta shosa is defined as dryness of all the seven dhatus. Seven dhatus are rasa, rakta, mansa, meda, Asti, majja and sukra. These dhatus maintain the structure and function of all body. They have also two function dharana and posana. All the dhatus performing their own function gives poshana to the next dhatu described in above serial. so if the formation and nutrition of one dhatu is disturbed then all the next dhatus will be disturbed.

Initial dhatu is rasa dhatu which is the end product of ahara rasa. Good quality and quantity of balanced diet is responsible for general growth and development of body but the normal physiologic process involved for digestion, absoption and metabolism are also play important role. From ahara we take after the action of pachakagni, ahara rasa is formed and from ahararasa with the action of different dhatwagnis different dhatus are formed and then upon the dhatus with the action of different mahabhutagni at different level it nourishes panchamahabhuta sharira.by this also satisfies the panchamahabhuta theory.

If impairment at any level of agni is formed it makes impairment at that level and disturbances in further level. Agni in body acts with the help and samyavastha of vayu and kapha. So balancement of agni, vayu and kapha with proper diet is required for maintenance of normal built of body.

In shosa if impairment of any one of the above occurs it makes improper nourishment or body built. Thus balashosa can be defined as the decreasing or drying of all the seven dhatus in balyavastha.

Nidana (Etiology)

The causes of Balashosha are excessive sleep in day time. Intake of cold water and use of kapha vitiated breast milk. By excessive sleep in day time and use of kapha vitiated milk the amount of kapha in body increases and due to intake of cold water both kapha and vata are vitiated.

So there is the vitiation of kapha dosha and kshaya of rasadhatu initially and vitiation of vata dosha results at lastly, which are the main factors responsible for Balashosha.

Samprapti (Pathogenesis)

The concept of Ayurved has emphasised that when all the doshas are in balance state, the body remains healthy and disease free. Imbalance of ‘doshas’ is the root cause of disease and the severity of disease depends upon the degree of vitiation of doshas. Balanced state of dosha is essential for health. Improper or defective Ahara (nutrition) and Vihara (behaviour) are two main factors of disturbing the doshas. When Ahara and Vihara are defective, the doshas are vitiated. This leads either kshaya (decrease) of one or all the doshas or it may cause vridhi (increase). Kshaya and vridhi produces the disease in the body according to their

properties. Vridhi of doshas produces more serious symptoms as compared to its kshaya. Vitiated kapha dosha takes the help of other doshas for its action of blocking the srotas.

In Balashosa due to nidana sevana there is increase in kaphadosha. The increased kapha obstructs rasavaha srotas. So there is generation of rasavaha srotasdusti lakhyanas and according to uttorattara dhatu poshana theory there is impairment in noushrishment to the further dhatus like rasa, rakta, mansa, meda, asti, majja, sukra. Hence other dhatu kshyaya lakhyanas are found with increment of vata dosha, causing emaciation in the child that is Suskata with other associated symptoms of Balashosa.

Rupa (Clinical features)

In Balashosha there is vridhi of kapha dosha as well as kshaya of rasadhatu and further dhatus. Thus Balashosha exhibit the clinical features of rasa kshaya.

The following Rupas are enumerated in Astanga Hridaya.

- Aruchi (anorexia)
- Pratishyaya (coryza)
- Jwara (pyrexia)
- Kasa (cough)
- Shosha(emaciation)
- Snigdha mukha (paleness of face)
- Singdha netra
- Shukla netra

The above mentioned clinical features are also mentioned by Charaka, Sushruta and other writers in their references to Rasakshaya.

Symptoms of Balashosha according to different authors

Symptoms	KS	CS	Sh.S.	AS	AH	MN	BP	Sa.S	V	GN
Arochaka	–	–	–	+	+	–	–	–	+	+
Pratishyaya	–	–	–	+	+	–	–	–	+	+
Jwara	–	–	–	+	+	–	–	–	+	+
Kasa	–	–	–	+	+	–	–	–	+	+
Shosha	–	–	–	+	+	–	–	–		+
Snigdha mukha	–	–	–	+	+	–	–	–	+	+
Snigdha netra	–	–	–	+	+	–	–	–	–	+
Sukla mukha	–	–	–	+	+	–	–	–		
Sukla netra	–	–	–	+	+	–	–	–		

Chikitsa Sutra (Treatment Principle)

The principle of treatment lies in eradicating the of cause and normalization of the doshas and dushyas.

The principle of treatment of Balashosha is as follows.

1. *To relieve obstruction of Srotas*-- Sodhan karma should be done to relieve the obstruction of rasavahi srotas. The children are delicate. So the full-fledged panchakarma therapy may not be undertaken here. However, for sodhan purpose, a purge by medicated milk is given.

2. *To stimulate Agnis*-- After removing the obstruction of the srotas, attempts are made to stimulate agni for correction of diminished metabolism of the Dhatus. This is achieved through Dipana and Pachana drugs which increase jatharagni and thereby dhatwagni as well.

3. *Use of Brimhana Drugs*-- As the agni is corrected by deepana and pachana drugs, now the child is able to digest and metabolize his diet. So nutrient therapy is administered for promotion and strengthening of the dhatus through restorative drugs or nutrient tonics.

Ancient authors as well as recent physician both have laid trace on diet. The diet should be easily digestible, palatable and a balanced one. It is to be noted that diet should be increased gradually as per the digestive power of child. Artificial feeding is to be advised if mother's milk is insufficient or it is vitiated.

During the management of Balashosha, the importance should be given for a good environment, hygienic measures and fresh air and sunrays etc. should be provided to the child.

Chikitsa (Treatment)

Vagbhatta has mentioned the different yogas for the treatment of Balashosha.

The following drugs in powdered form mixed with honey and ghee should be administered.

(1) Saindhawa, Trikatu, Gunjamoola, Patha, Mahakadamba. This is quite useful for anorexia in an emaciated child.

(2) Powder of Ashok (Kutki) and Panchakola (Pippali, Pippali mool, Chavya, Chitraka and nagara) mixed with ghrita can be given for anorexia and emaciation.

(3) Powder of Badari, Dhataki flower and Amalaki mixed with ghee in suspended form given to the child.

He has mentioned the use of different types of Shishu Shoshnashaka ghritas, Shoshanaskaka Taila and lakshadi tail for Balashosha.

He also advised the use of powder of Ativisha, Karkatasrungi, Pippali mixed with honey for cough, fever and vomiting.

Sushruta advised the use of Aswagandha, Bidarikanda, Satavari, Atibala, Nagabala, Madhura dravya etc. for karsya roga.

Acharya Kashyapa has advised several kinds of lehas for the proper growth and development of children.

Shishushoshanasaka ghritas are

(1) Ghee prepared with Salaparni, Bacha, Bruhati, Kakoli, Pippali, Tagara, Jalabetasa, Kamala, Punarnava, Varngi and Mustaka helps in opening the srotas.
(2) Ghee prepared with Nichula, Aswagandha, Tulasi and Pippali helps in opening the strotas.
(3) Soshajid ghrita prepared with Yasthimadhu, Pippali, Lodhra, Padmaka, Kamala, Chandan, Talisa, Sariba helps to cure Balashosha.
(4) Ghee prepared with kalka of Karkatasrungi, Madhulika, Varngi, Pippali, Debadaru, Aswagandha, Kakoli, Ksheerakakoli, Rasna, Rusavaka, Jivaka, Mudga parni, Mashaparni, Vidanga and decoction of Sasaka Sira helps in poshana of emaciated child.

Shoshanasaka Taila - Oil prepared with Bacha, Amalaki, Tagara, Haritaki, Choraka, Chhaga mutra and Sura is best for abhyanga in balashosha.

DISCUSSION

After literary study of both diseases it can be discussed that although the in general cause of both the diseases varies but the basic cause of both the diseases is same that is improper nutrition.

Considering the sign and symptoms it is found that the main symptom of both the disease are emaciation or sushkata due to improper weight gain.

The symptom of recurrent systemic infections of PEM mainly respiratory tract infection can be compared with Pratisyaya and Kasa of Balasosha and recurrent GIT infection of PEM

although not found in Balasosha but Arochaka or loss of appetite is found in both the diseases. In our Ayurvedic science one cause of Arochaka is Mandagni and it causes all types of Udararogas. Symptoms of deficiency of different micronutrients and vitamins of PEM can also reflect as the symptom of Mukha and Chakshyu Suklata and Snigdhata with emaciation of Balasosha.

Fever is the main cardinal feature of any types of infection present in both the diseases. Comparing the treatment principle of both the diseases Agni dipana and Pachana principle of Balasosha is same to the administration of appetizer and digestive of PEM.

Principle of Brimhana in Balasosha is same as to Proper and energy rich diet of PEM.

Extra in Balasosha is Srotosodhana to eliminate obstructive Kapha in Rasavaha srotos deviates from the principle of treatment of different systemic infections of PEM but a little extent it can be comparable as some of the infectious can be cured by sodhana Chikitsha.

CONCLUSION

From the above literary study and discussion of both Baloshosh and PEM, it can be concluded that the present enforcing problem of todays paediatric society protein energy malnutrition can be compared some extent with the disease Baloshosha described exclusively our Ayurvedic text Astanga hridaya and it can be treated satisfactorily by the herbal formulations described in the context of Baloshosha of AH.UT 2/50 to prevent and cure the disease.

REFERENCES

1. Astanga Hridaya with the commentaries (Sarvangasundara) of Arundutta and Ayurvedarasayana of Hemadri, Published by Chaukhamba Orientalia, Varanasi, 7th Edition, 1982.
2. Ashtanga Samgraha: (Part-I), Hindi commentary by Atrideva Gupta, Published by Satyabhama Bai Pandurang, Nirnaya Sagar Press, Bombay, 1st Edition. 1951.
3. Ayurvediya Kriya Sarira: Vd. Ranjeet Rai Desai, Baidyanath Ayurveda Bhawan, Nagpur, (1999).
4. Bhaisajya Ratnawali, commentary by Jaideva Vidyalankar, Published by Motilal Benarasi Das, Varanasi, 6th Edition, 1953.

5. Charak Samhita with Ayurvedadipika commentary by Chakrapani Dutta and Vidyotini, Hindi commentary by Pt. Kashinath Shastri, Published by Chaukhambha Sanskrit Series Office, Varanasi, Part-I, 1st edition, 1969.
6. Charak Samhita with Ayurvedadipika commentary by Chakrapani Dutta and Vidyotini, Hindi commentary by Pt. Kashinath Shastri, Published by Chaukhambha Sanskrit Series Office, Varanasi, Part-II, 1st edition, 1970.
7. Charak Samhita, Critical Notes by Prof. P. V. Sharma, Published by Chowkhambha Orientalia, 1st edition, 1994.
8. Child Health Care in Ayurveda by Dr. Abhimanyu Kumar, Published by Sri Satguru Publication, Delhi, 1st Edition, 1994.
9. Introduction to Kasyapa Samhita, By Prof. P.V. Tewari, Published by Chaukhanibha Visvabharati, Varanasi, 1st Edition, 1997.
10. Kashyapa Samhita, Edited by P.V. Tewari, Published by Chowkhambba Visvabharati, Varanasi, 1st Edition, 1996.
11. Kashyapa Samhita, Hindi commentary by Shri Satyapal Bhishagachaiya, Chowkhambha Sanskrit Sanathan, Varanasi, 7th Edition, 2000.
12. Madhava Nidana: (Part I & lI) with Madhukosha Commentary of Vijaya Rakshit & Shrikantsha Datta. Vidyotini Hindi commentary by Sundarshan Shastri, Chowkhambha Series, 3rd Edition, 1966.
13. Research in Ayurveda, M. S. Baghel, Mirdu Ayurvedic Publications and Sales, Jamnagar, 1st Edition.
14. Sanskrit English Dictionary, M.M. William, Indian Books, Varanasi.
15. Sharangadhar Samhita with the commentaries i.e. Adhamalla's Dipika and Kashiram Gudhartha Dipika, published by Chaukhambha Orientalia, Varanasi, 3rd Edition, 1983.
16. Sushruta Samhita with Nibandha Sangraha, Commentary of Shri Dalhanacharya and Nyayachandrika Panjika of Shri Gayadascharya on Nidanasthana, Published by Chaukhambha Orienialia, Varanasi, 4th Edition, Reprint, 1980.
17. Tridosha Theory by Dr. V. V. Subrahamanya Shastri, Arya Vaidyashala, Kottakkal, 3rd Edition, 1996.

MODERN BOOKS

1. Achar's Text book of Paediatrics by J. Viswanathan, A.B. Desai, Orient Longman, 3rd Edition.
2. Ghai Essential Paediatrics by O.P. Ghai, CBS Publishers and Distributors, 6th Edition.

3. IAP Text book of Paediatrics by A. Parthasarathy, Jaypee Brothers Medical Publishers, New Delhi, 3rd Edition, 2006.
4. Nelsons Text Book of Paediatrics, Book-I (Part-I-XVII) 15th Edition, by Richard E., Berhman and Robert M., Kligman, Ann. M. Arvin, Waldo E. Nelson.
5. The Short Text book of Paediatrics, Suraj Gupte, Jaypee Brothers Publishers, New Delhi, 8th Edition.
6. World Health Organisation, The ICD II classification of Mental and Behavioural disorders. Oxford University press.