

## AN AYURVEDIC INSIGHT ON ROLE OF IMMUNE SYSTEM IN RECURRENT RESPIRATORY INFECTION IN CHILDREN

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### ABSTRACT

Chronic as well as recurrent respiratory disorders are major concern in childhood pediatric practice as we commonly come across such cases in day to day pediatric practice. Recurrent respiratory infections are attributed to immaturity of the immune system, functional, structural limitations, dependency on others, unawareness of hygienic importance and nutritional issues related to weaning etc. Excess intake of sweetish substances, growth potential and school environment also contribute for the same. Mean time the congenital abnormalities of the respiratory and cardiovascular system; also, significantly contribute the recurrent respiratory tract infections. Ayurveda explains the stage of *Bala* or the childhood as stage of immaturity in structural, functional, emotional, and linguistic and behavior and sexual facets with predominance of the *Kapha Dosha*. Certain of the Respiratory problems in children are also aggravated by the habit of withholding the natural urges as maximum protective reflexes in the upper part of the body pertaining to respiratory system and helps to prevent the portal of entry for maximum infections. Protective reflexes like sneezing, coughing, hiccup, *Shrama shwasa*, yawning, lacrimation etc., are in true sense keep away the respiratory tract infections. Classics of Ayurveda explain the treatment *Kasa* in detail and by keeping classical explanation narrated in *Kasa Chikitsa* of different *Samhita*. However, classics explains that *Pratishyaya* when not treated leads to *Kasa* and *Kasa* further leads to *Rajayakshama*. Such incidences are quite common in children as there is immaturity of immune barriers in the growing stage of the child. Hence treatment should contain

immune enhancing drugs or other modes of enhancing the immunity which helps to prevent such recurrent infections.

**Keywords:** *Kapha Dosh*, *Kasa*, *Paratishaya*, Immune system, Congenital, *Vega dharana*

## INTRODUCTION

Chronic as well as recurrent respiratory disorders are major concern in childhood pediatric practice as we commonly come across such cases in day to day pediatric practice. Recurrent respiratory infections are attributed to immaturity of the immune system, functional, structural limitations, dependency on others, unawareness of hygienic importance and nutritional issues related to weaning etc.<sup>1</sup> Excess intake of sweetish substances, growth potential and school environment also contribute for the same. Mean time the congenital abnormalities of the respiratory and cardiovascular system, also significantly contribute the recurrent respiratory tract infections. As for as the structural and functional and immunological immaturity of respiratory tract is considered the conducting airways especially the terminal bronchioles grow slowly by the end of 8 years hence it is obvious that smaller airways offer more resistance. Further the elastic recoiling of lung in children is less as compared to adults which affect the act of ventilation. Meanwhile the diaphragm is flat when compared to adults resulting in less pressure changes as vertical diameter is not more as expected. Bucket handle movements of the ribs increasing the transverse diameter is also less, as ribs are more horizontally placed. Intra luminal mucus production is more which frequently cause the air way obstruction in children, predisposing the Respiratory infections<sup>2</sup>. Integrity of oral and respiratory mucosa is also on the lower side in children further the effective ventilation is not possible due to change in the different lung volumes and capacity. All the above factors in total contribute to more incidences of Respiratory infections in children.

**General Description** Respiratory infections in children can be assess by manifestation of certain symptoms. The high-grade fever, purulent secretions are mostly suggestive of bacterial infections. Mean time immune deficiency status should be reassessed.

Recurrent infections at a single site are mostly points towards the anatomical obstruction, congenital anomalies, allergies, or lodging of the foreign body at the site<sup>3</sup>. When recurrent infection is there in newborn or infants the proper birth history like exposure to maternal infections, premature babies, complications like bronco pulmonary dysplasia, blood transfusions etc. is of great help. History of delayed umbilical cord separation leukocyte adhesion abnormality. Chronic medical problems like catheterization, shunting prosthetic device applied to the baby, and gastro esophageal reflux, frequently witness the recurrent infections of the respiratory tract. Meanwhile history of improper handling of protective reflexes of the body (*Vega Dharna*) should be collected. *Heena*, *Madhyama*, *Ati Yoga* of these protective reflexes by the child may also contribute for the Recurrent Respiratory tract infections. Forceful withholding of these protective reflexes provide an easy access for the external hazards inside the body<sup>4</sup>. It is also must confirm the integrity of mucocutaneous barriers like dermal sinus tracts, burns, surgical wounds that causes recurrent infections. History of immunodeficiency disorders, unexplained infant deaths, risk factors of the HIV, environmental exposure to allergens, pet animals in the home traveling or changes in the routine of the child, congenital problems of respiratory, cardio vascular and gastro intestinal tract must be enquired.<sup>5</sup> As allergy is the main cause of such recurrent infections so the physical examination for transverse nasal crease, allergic shiners, swollen pale nasal mucosa, post nasal dripping, scarred tympanic membrane, cervical adenopathy must be done. Frequent non febrile episodes, poor response to medications History of food intolerance / eczema, family history of atopic disease, poor growth, Failure to thrive, dull child, recurrent infections in the same site are certain clues to assess the cause of allergy as a cause<sup>6</sup>. Chronic respiratory

infections lead to systemic illness, decreased academic performances, malnutrition and poor appetite in due course of the time resulting in immunodeficiency status of the child. Meanwhile certain secondary disorders like Cystic fibrosis, Immune deficiency syndromes, Diabetes mellitus, sickle cell anemia, Cirrhosis also witness the same. Meanwhile all recurrent attacks of cough are not fatal and matter of concern. Half of the children with Respiratory tract infections are normal. Recurrence is normal in Children of large family and those who attend the day care center and usually experience 6-10 viral infections in childhood period. They should be examined and usually show normal growth and development pattern and normal physical examinations<sup>7</sup>.

## DISCUSSION

As we know there will be descending of infection in the respiratory tract once the causative factor enters inside by overcoming the defense barriers of different types. The respiratory infections begin with nasal mucosa area and Ayurveda consider this as *Pratishaya*. Same is called as upper respiratory tract infection in other words. This stage is characterized by either the sneezing or the nasal blockage / stuffiness. This is referred as either *Kshaivthu* or *Nasanaha* in Ayurveda<sup>8</sup>. As the infection carried forwards in the oral cavity area up to pharynx there will be development of postnasal drip and presence of cough which ensures the development of lower respiratory tract infection. This is the stage where *Kasa* of different types develops. *Vataja*, *Pittaja* and *Kaphaja Kasa* develops during this period shows either acute or chronic presentations, depending on exposure of causative factors<sup>9</sup>. Meanwhile the stage of *Pratishaya* or the upper respiratory tract infections gives the sufficient time for the body immune system to fight against the cause and effectively prevent its entry below the lower Respiratory tract. This stage may be bypassed in case of mouth breathers or obstruction of nose due to various causes, leads to easy entry of infection beyond the lower respiratory tract<sup>10</sup>. Once the infection reaches below the lower respiratory tract it reaches the trachea and the bronchus, leading to tracheitis and bronchitis

with typical presentation of respiratory discomfort, increased respiratory rate, and dyspnea along with cough. Ayurveda refers all such condition which enters inside the lung parenchyma as *Rajyakshama* with different levels of severity. Hence it is clearly told that *Pratishaya* leads to *Kasa*, while *Kasa* leads to *Rajyakshma*. This is explained in the context *Nidanarthakara Roga* and explains the pathology of chronic respiratory disorders in children<sup>11</sup>. It is quite clear each stage has got two possibilities. Either the disease subsides in the given stage or leads to chronicity. Intact immune system of the child is able to check the infection in nasal mucosa by closing the door for its further progression. Same is with oral mucosa also. Any way respiratory tract in adults offers different types of defense barriers like mechanical, chemical, cyto toxic and the immunological. Nasal mucosa, ciliated epithelium, nasal secretions also helps in checking the infection. A strong and intact immune system which is not hindered by certain congenital, structural abnormalities like deviated nasal septum, dental abnormalities, cleft lip /palate, nasal polyp etc. offers the immunity and check the further spread<sup>12</sup>. But as we know childhood is state of *Sleshma* dominance with immaturity of all the *Dhatus*. (*Balo Vivardhate Sleshma*). *Bala* is also called as *Oja* and *Guna* of *Apara Ojas* is similar to *Kapha*. Hence for all practical purposes *Kapha* can be correlated with Immune factor. Instability of the immune factors leads to the progression of the disease and chronicity which is rightly explained by Ayurveda as *Asampurna Dhatu* and *Bala* and *Veerya*.<sup>13</sup> So chance of lower respiratory tract infection can very easily lead to lower Respiratory infection and pneumonia. Hence the treatment should contain an immunomodulator drug in prescription of recurrent respiratory infections irrespective of cause type and stage of the disease. Different method of immune enhancement like *Swarna Prashana* can be well used to overcome this problem<sup>14</sup>. In Newborn and infants, regular breast feeding till the *Ksheerapa* period is a good immune modulator and effectively prevent recurrent respiratory infections. Meanwhile bottle feeding, and top feeding increases the infection rate. Certain drugs like *Yastimadhu Rasayana*, *Guduchi*

Rasayan, Vardhamana Pipli Rasayana, Ajamamsa Rasayana, Vasa Guducchyadi Avaleha, Brihat Chagaldya Ghrita, Amrita Prasha Ghrita, Chavana Prasha Avaleha, Pipladya Ghrita, Drakshasava<sup>15</sup> which can be prescribed in required doses regularly to enhance the immunological status of the child.

## CONCLUSION

Hence it can be concluded that Immune enhancing treatment, or other methods of immune modulation is must to protect the newborn and infants from recurrent respiratory tract infection. Mean time habit of *Vega dharana* need to check frequently and certain congenital abnormalities of the Respiratory system and other body sytem need to be corrected. Providing the optimum nutrition to the child is equally important to develop the body immunity and to fight against these infections.

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