cough in pertussis

Case Study

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Effect of *Basti* (oil enema) therapy for the management of

Abstract

Bordetella pertussis continues to circulate even in countries with good childhood vaccination coverage. Sporadic cases are still observed either due to no vaccination, incomplete vaccination or as a result of failure of vaccination. Though acute in nature it has a longer disease span with multiple life-threatening complications despite adequate management. This study was undertaken to study the effect of *Sneha Basti* (oil enema) in pertussis in relation to reduction in intensity of cough and complications of the disease when administered along with the conventional pharmacological therapy. Patients with the clinical picture mimicking pertussis were screened, investigated for pertussis and appropriate conventional pharmacological therapy of Erythromycin a preferred antimicrobial agent was started. Concurrently, *Sneha Basti* was administered to these two children. Both patients showed favourable results in terms of reduction of *Kasa* (cough) and the disease period with a faster recovery when compared to conventional therapy alone as has been observed routinely. No complications incurred during the complete disease span. It was concluded that if the pharmacological therapy is augmented with the complimentary systems of medicines, it can reduce the prolonged span and intensity of the disease and prevent other complications.

Key words: Erythromycin, Kasa, pertussis, Sneha Basti

Introduction

The prevalence of *pertussis* has diminished world-wide only due to effective implementation of active immunization program.^[1,2] Unless treated in the very early stages, it runs a lengthy span of 8-12 weeks, classically through three stages characterized by episodic paroxysms of cough of increasing intensity ending with a high-pitched inspiratory whoop lasting for 4-6 weeks or even more.^[3,4] Possible explanations for the increase in disease incidence include incomplete vaccination, decreased vaccine efficacy, waning immunity, increased awareness and enhanced surveillance. Without natural re-infection with Bordetella pertussis or repeated booster vaccinations, adolescents and adults are susceptible to clinical disease, if exposed.^[2,5,6] Infants are more prone to complications arising out of cough, due to the marked increase in pressure in various compartments such as the thoracic and the cranial spaces. Furthermore, malnutrition is the end-result of the

Address for correspondence: Dr. Rahul Haridas Gujarathi, 'Shree' A-6, Suparshwanath-D Society, 692/693, Market Yard Road, Gultekdi, Pune - 411 037, Maharashtra, India. E-mail: shrigujarathi@gmail.com disease in infancy and early childhood due to protracted course of the illness interfering with feeding. $^{[3,4,7]}$

Ayurveda, the traditional Indian medicine, has considered *Kasa*, as a symptom as well as a separate disease entity.^[8] Multiple treatment modalities and therapies have been advocated for treatment depending upon the pathogenesis and severity of the disease. Two paediatric cases of *pertussis* were treated with conventional treatment guidelines along with *Sneha Basti*^[9] as described in Charakasamhita and it was found that not only the span of paroxysmal and convalescent stages are reduced causing a reduction in gross disease period, but also a fast post disease recovery.

The experimental intervention was carried out with the motive of integrating traditional therapies with conventional treatment modalities with the aim in reducing cough, the agony and discomfort associated with long standing cough and preventing the complications that might arise with dry hacking cough, which stays persistent for a long duration despite adequate treatment.

Case Reports

Case 1

An 18-month-old child was admitted with a history of mild to moderate grade fever for 6 days, 15 days prior to the onset of

episodic bouts of dry and hacking cough lasting 2-3 min followed by inspiratory whoop, for more than 10 days occasionally associated with vomiting. The immunization schedule was complete with the last dose of DTwP booster at 16 months of age. On physical examination, the child weighed about 08 kg at the time of admission and was afebrile with a pulse rate of 110/min and a respiratory rate of 34/min with no specific chest findings on auscultation. On hemogram, haemoglobin level was 10.9 g/dL, total leucocyte count was 42,800/cmm and a normal platelet count. The erythrocyte sedimentation rate (ESR) was 20 mm at the end of 1st h. The differential leucocyte count showed polymorphoneucleocytes at 18%, eosinophils at 01%, lymphocytes at 80%, monocytes at 01% and no basophils. The chest radiograph was normal.

Case 2

A 2-month-old child a migrant from the northern part of the country who was admitted with a history of moderate grade fever lasting for 10-12 days associated with dry cough of increasing intensity since 4-5 days. The bouts lasted for about 2-3 min on the 1st day, but at the time of physical examination it was about 3-4 min. The infant used to gasp for breaths in between the cough spells. Vomiting was occasionally present. The baby had only received a shot of Bacille Calmette Guerin vaccine at birth and was due for DTwP vaccine. On physical examination, he weighed 03.9 kg and was afebrile with a pulse rate of 124/min and a respiratory rate of 44/min. The chest examination on auscultation was evident of mild bronchospasm. There was no refusal to feed, but the baby would vomit if cough appeared during feeding. The baby was ruled out for esophageal atresia and other related congenital anomalies. On hemogram, haemoglobin was 09.8 g/dL, total leucocyte count was 34,000/cmm, which rose to 40,200/cmm on the 5th day of admission and a normal platelet count. The ESR was 14 mm at the end of 1st h. The differential leucocyte count showed Polymorphoneucleocytes at 19%, eosinophils at 02%, lymphocytes at 74% (85% on 5th day), monocytes at 05% and no basophils. The chest radiograph was normal.

In both the cases, pharyngeal swabs were sent for influenza a virus culture along with culture for *B. pertussis* in view of the hemogram and clinical presentation. Both the samples were negative for influenza, whereas, the sample of case 1 was positive for *B. pertussis* and that of case 2 was reported negative with no growth of any pathognomonic organism. Though the culture was negative for growth of any pathognomonic organism a diagnosis of *pertussis* was made upon the clinical presentation and the hematology reports favoring the diagnosis. There are multiple factors affecting in obtaining a positive culture report.^[10] Both the patients were started empirically on Erythromycin therapy^[11] in a dose of 40 mg/kg/day in 4 divided doses as recommended in management of *pertussis* on the 1st day of admission though the reports for culture were awaited and the drug was further continued for 14 days.

The team of the doctors working on the patients decided to use the *Sneha Basti* therapy as has been advised in Charakasamhita. The logic applied was, the symptoms seen in the patient were very much similar to that of *Kasa* disease and more specifically favouring the diagnosis of *Vataja Kasa* and not merely as the symptom *Kasa*. The diagnosis of *Vataja Kasa* was made because of two major symptoms, presence of dry cough with practically no expectoration or phlegm and a change in voice of the patient that were seen. The third symptom was that the patient is easily exhausted after bouts of cough. Ayurveda has the distinction amongst other health sciences where a few symptoms have an existence as symptoms and sometimes as an entire disease entity.^[8] Sneha Basti was administered in a dose 20 mL in the first case and 10 mL in the second case as has been described in the text. Plain Sesame oil was warmed in a water bath and was administered with a sterile syringe through an infant feeding tube in the early afternoon hours, post feeding. The Sneha Basti therapy was started on the 7th day of anti-microbial therapy and was continued for the next 14 days. Favorable results in terms of reduction in intensity initially and later the frequency of bouts of cough, reduction in incidence of vomiting, reduced sleep disturbances and extended uninterrupted sleep hours were observed during the treatment. The intensity of the bouts of cough was seen to be reduced after a week of administration of Sneha Basti simultaneously with increased uninterrupted sleep hours. The patients were discharged on the 28th day of admission with a normal feeding advice. Both cases were followed-up weekly thereafter in the out-patient department for another 8 weeks. Both cases were free of any complaints of cough and other associated symptoms between there 6th and the 7th week of follow-up and showed no complications whatsoever during the complete observation period of 12 weeks.

Discussion

Pertussis is an acute bacterial infection caused by *B. pertussis*. Despite high childhood vaccination coverage, it still remains a substantial cause of morbidity. The cough duration is longer in children than in adults with *pertussis*, the median cough duration is of 112 days against that of 42 days in adults.^[12] Vaccination is the most important preventive strategy. However, immunity wanes in later years and older children become susceptible again. Erythromycin, has been the anti-microbial drug of choice for post exposure prophylaxis, administered for 14 days.^[11]

The characteristic cough is a sensitive indicator. A diagnosis can be confirmed by culture. The disease should also be considered in young infants who have classical symptoms and have not completed 3 doses of the vaccine as was considered to be a finding and favored the diagnosis in case 2 along with other haematological findings. The lab findings show absolute lymphocytosis and its degree parallels with the severity of the disease. Though culture is the gold standard test for diagnosis, many other factors influence its result.

Complications include pneumothorax, epistaxis, sub-conjunctival haemorrhages, sub-dural haematomas, hernia, rectal prolapse and these mostly result from the effects of pressure generated by severe coughing^[11] and thus the management of cough is equally important as that of antimicrobial treatment.

Ayurveda is based on the principles of *Vata*, *Pitta* and *Kapha*, the three basic pillars of the body. Functional normalcy of all the three is considered as physiology and disparity of any single of them is considered to be the cause of a disease.^[13-15] *Kasa* is one such symptom which comes up due to the disparity of *Vata* occurring in its main seat, the colons.^[16] The restoration of *Vata* to normalcy cures *Kasa* and the best place to control and restore

its function is at its seat, i.e. the colons.^[17] Incidentally, *Sneha Basti* is one such treatment modality that can be administered from birth itself,^[18] acts on *Vata*^[19] and also on the colons. The classics further state that *Sneha Basti* should be administered in appropriate doses^[20] to those with cough that do not respond adequately to oral medications. The oil used can be sesame oil or medicated oil, an antidote of *Vata* and the *Sneha Basti* were administered to stay in the colon for a longer duration, more than 6 h^[21] and it is believed to act, not only locally but also systematically by sharing the potency of the medicines.^[22] Thus pacification of local *Vata* restores the functional normalcy of systemic *Vata*, a causative factor of dry hacking cough.

Conclusions

Cough is a major symptom in pertussis and most of the complications of pertussis arise because of cough. Centrally acting cough suppressants such as codeine and dextromethorphan, used to suppress cough have a limited utility. The conventional therapy does not reduce the span of disease making the patient mostly confined to home due to a long recovery period. Furthermore, malnutrition and weight loss is seen in pediatric cases as a result of post-tussive vomiting. Sneha Basti shows an early recovery or a smaller disease span as indicated by reduced frequency and intensity of cough bouts within a very few days of administration and absence of complications during the disease period with a complete recovery within 10-12 weeks, i.e. 70-84 days when compared to a mean 112 days by the conventional pharmacological therapy alone. This itself is an indicator of smaller hospital stay and suffering and is suggestive of a success of the experimental intervention.

The experimental study has its limitations due to the number of subjects available, but might be a milestone in the formulation in the newer treatment modalities integrating the conventional therapies with traditional systems of medicine.

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हिन्दी सारांश

परटूसिस व्याधि जनित कास में बस्ति चिकित्सा का प्रभाव

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विकसित राष्ट्रों में टीकाकरण कार्यक्रम के प्रभावी परिपालन के बाद भी परटूसिस व्याधी का हेतु बोरडेटेला परटूसिस जीवाणु का प्रसार पाया गया है, जो वयस्कों में भी बच्चों जैसे व्याधी उत्पन्न करता है। विकासनशील देशों में इस व्याधी के पाये जाने के अनेक कारण है जैसे की टीका न लगवाना, असंपूर्ण टीकाकरण, आदि। यह एक अत्यंत आशुकारी व्याधी है। त्वरित तथा सुयोग्य चिकित्सा के अभाव में यह दीर्घकाल तक अपने लक्षण दिखाती है व पीडा उत्पन्न करती है। प्रस्तुत अभ्यास, इस जीवाणु जनीत व्याधी में कासादि उपद्रवों पर तैल बस्ति का प्रयोग प्रचलित तथा प्रस्थापित करने हेतु आधुनिक चिकित्सा के साथ किया गया है। कुल दो बालकों में इस संयुक्त उपक्रम का प्रयोग किया गया। दोनो बालकों में इस उपक्रम का कास लक्षण पर अच्छा प्रभाव देखा गया। प्रस्थापित आधुनिक चिकित्सा की तुलना में इन बालकों में अल्पकाल में ही उपशय देखा गया है। इन में अन्य कोई उपद्रव भी नहीं देखा गया। इस अनुसन्धान से यह निष्कर्ष लिया जा सकता है कि प्रस्थापित आधुनिक चिकित्सा के साथ बस्ति चिकित्सा का प्रयोग किया जाए तो व्याधिकाल कम किया जा सकता है, तथा उपद्रवों को रोका भी जा सकता है। इस अध्ययन से यह निष्कर्ष नहीं लिया गया की बस्ति चिकित्सा यह परटूसिस की परीपूर्ण चिकित्सा है, अपितु यह निष्कर्ष निश्चित किया जा सकता है कि संयुक्त चिकित्सा का लाभ निश्चित ही अधिक है।