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Research Article

A CLINICAL STUDY OF *DRAKSHADI* SYRUP IN LOWERING ABSOLUTE EOSINOPHIL COUNT (AEC) AND IMMUNOGLOBULIN E(IGE) LEVEL IN *TAMAK SWASH* (BRONCHIAL ASTHMA) IN CHILDREN

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ABSTRACT

Childhood asthma is a prevalent chronic disease worldwide, affecting millions of children. Its impact is not only on the children themselves but also on their families, schools, and healthcare systems. Inspite of all recent advances in modern medical science the prevalence is increasing day by day. **Aim:** The present study is to assess the response of polyherbal compound '*Drakshadi* Syrup' in lowering AEC and IgE level in childhood bronchial asthma. **Materials and Methods:** 106 nos. of patient were registered irrespective of sex between the age group 3-16 years out of which 100 patients completed the trial. Routine blood investigations including basic pathological markers i.e., AEC and IgE were recorded before and after 90 days of treatment. **Statistical Tool Used:** Paired-t test was done in GraphPad prism 10 software for data analysis. **Results and Conclusion:** After statistical analysis the t value of AEC was 13.31 with p<.0001 i.e., highly significant and in IgE the t value was 9.73 with p<.0001 i.e., highly significant. It can be concluded that the polyherbal compound is very effective in lowering AEC and IgE levels in childhood bronchial asthma.

INTRODUCTION

The word '*Swash*' means respiration. It is the Sanskrit word "*Shwas*" which is derived from the root word "*Shwas Jivane*" which means - the existence of life through *Pran Vayu.* All types of breathing difficulty are called *Swash*. According to all Ayurvedic classics *Swash Roga* is of five types viz- *Maha Swash, Urdha Swash, Chhinna Swash, Tamaka Swash,* and *Kshudra Swash*. Out of the 5 types, *Tamaka Swash* is very much similar to bronchial asthma depending upon its clinical features and aggravating factors, etc.

Asthma is a chronic lung disease with airway obstruction, airway inflammation, and hyper-reactivity to various stimuli, often reversible with bronchodilators and anti-inflammatory drugs[1].

Asthma is the most common chronic childhood disease in nearly all industrial countries. An attack is experienced when the asthmatic child's chronically inflamed bronchial airways, having become sensitized to certain environmental allergens (e.g., dust, smoke etc.) and conditions (e.g., exercises, cold weather) being to produce mucus in their presence. This leads to swelling and muscle contraction that obstructs airflow and restricts breathing[2].

Asthma is one of the most common major non-communicable diseases and for many, has a substantial impact on quality of life. Globally, asthma is ranked 16th among the leading causes of years lived with disability and 28th among the leading causes of burden of disease, as measured by disability-adjusted life years (DALYs). Around 300 million people have asthma worldwide, and it is likely that by 2025 a further 100 million may be affected.[3]

Asthma is a global health problem, affecting approximately 300 million people worldwide and 1000 deaths per day[4].

Asthma mortality and hospitalization rates with acute severe asthma attacks also increased in all age groups during the period from 1960 to 1985, with the highest rates of increase in young preschool children[5]. Following this period, during the 1990s and early 2000s, a decreasing trend in severity has been observed. However, despite novel treatments and

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improved inhalers for the administration of topical therapies, no further improvements in either mortality or hospitalization rates have been observed in the last decade, either in children or adults[6].

Exposure to outdoor and indoor allergens is a significant risk factor for allergic asthma. In infancy, food allergy is an important triggering factor. RSV is a common cause of severe respiratory tract infection in infants which may persist in later childhood period also.[7] Passive smoking is one of the strongest domestic and environmental risk factors in developing asthma attacks at any age of childhood period[8].

Pathophysiology of Bronchial Asthma

Various stimuli can initiate asthmatic symptoms. These include immunologic IgE-mediated hypersensitivity reaction to allergens (dust, pollen etc.) and non-immunologic stimuli(viral infection, physical or chemical stimuli) which act by increasing the exposure of the airway to cool dry air and activate the cells and stimulate the autonomic nervous system which releases broncho-active and vasoactive mediators like histamine, eosinophilic chemotactic factor of anaphylaxis (ECF-A), neutrophilic chemotactic factor of anaphylaxis(NCF-A) and platelet aggravating factor (PAF).[1]

From the above pathogenesis, it is clear that IgE and AEC play an important role in the causation of bronchial asthma along with other factors.

MATERIALS AND METHOD

Selection of Patients

106 nos. of patients between 3 to 16 years of age of either sex were enrolled for the present study after getting written consent from the guardian or caretaker with signs and symptoms of *Tamak Swash* (Bronchial Asthma) like cough, wheezing sound on chest, fever, chest tightness, rhinitis, crepitation, etc. from O.P.D. & I.P.D. of hospital of Government Ayurvedic College, Jalukbari, Ghy-14 Assam, and kept in one single group. Out of 106 patients, 6 nos. of patients were discontinued from the study.

The patient suffering from cardiac origin asthma, tuberculosis, massive pulmonary embolism, malignancy, surgical problem, acute COPD, metabolic acidosis, pneumonia, left ventricular failure, psychic dyspnea, and acute severe bronchial asthma were excluded from the study.

Diagnostic Criteria

Diagnosis of patient were diagnosed based on clinical feature mentioned in both Ayurveda and modern science. A proforma was prepared for recording detailed allergic history, previous episodes, duration, demographic profile, history of previous hospitalization, etc. Thorough physical and systemic examinations were done along with laboratory investigations.

Investigations

- Blood: TLC, DLC, Hb%, ESR, AEC
- Stool: Routine & microscopic examination
- Urine: Routine & microscopic examination
- Sputum: For AFB to exclude tubercular pathology
- X-ray chest P.A. view (to exclude structural or other radiological abnormality)
- ECG: To exclude patients with cardiac diseases.
- Serum IgE Level

TLC, DLC, Hb%, AEC, and IgE levels are done routinely in all cases before treatment and after completion of the treatment (90 days).

Selection of Drug

A polyherbal compound '*Drakshadi Churna*' mentioned in Yogaratnakar Uttarardha[9] for the treatment of *Tamaka Swash* in children is selected for the study. The polyherbal compound includes *Draksha* (*Vitis vinifera* Linn.), Vasaka ((*Adhatoda vasica* Ness.) *Haritaki* (*Terminalia chebula* Retz.), and *Pippali* (*Piper longum*Linn). For palatability, the drug was made into syrup and named as *Drakshadi* Syrup.

Dose and Administration

All the drugs were taken in equal ratios and made into honey-based syrup. Though the drug was mentioned as a powder, to make it more palatable in children it was transformed into honey-based syrup. All the patients enrolled in the study were given the syrup in a dose of 1ml/kg/day in two divided doses for 90 days.

Parameters for Assessment

Objective assessments were done on improvement in clinical features and subjective assessments were made on improvement in different investigations.

Statistical Analysis

In the present study, GraphPad Prism was used to get the mean ($\bar{x}$), Standard deviation (SD), Standard Error (SE), standard error of mean difference (SED), p value, and t value.

OBSERVATION AND RESULTS

106 nos. of patients between 3 to 16 years of age of either sex were enrolled for the present study out of these 6 nos. of patients discontinued the trial. All the patients were kept in one group. The patients were investigated for TC, DLC, ESR, AEC, Hb%, IgE before and after 90 days of treatment.

The highest number of patients i.e., 60% belong to the age group 3-6 years followed by 23% in 7-10 years and 17% were 11 to 16 years of age. The maximum number of patients was female i.e., 52.00% whereas male patients were 48.00%.

The majority of patients i.e., 73.00% belonged to urban habitats and 27.00% from rural areas. The present study also shows that maximum number of

patients i.e., 54.00% were belonging to lower class followed by 36% from middle class and 10% from upper class respectively.

In the present study maximum nos. of cases (15%) had history of pneumonia followed by 12% of measles, 6% of typhoid, 2% of jaundice, and 1% of whooping cough but there was no history of meningitis and tuberculosis in past.

Present study showed that highest nos. of patient have provoked by Cold air/ cold season/Season Change i.e., 57%, followed by dust allergy in 53%, by cold water/cold drinks & ice creams in 41%, passive smoking in 24%, cloudy weather in 23%, curd or *Vyayam/*loud laughing/loud crying in 6%, strong odour or citrous fruit/banana/apple in 2% and mental stress in only 1% cases.

Table 1: Chief complaint and associated symptoms observed in 100 Patients of bronchial asthma

S.No	Sign & Symptoms	No. of Patients	Percentage
1	Dyspnoea	100	100.00%
2	Cough	100	100.00%
3	Prolonged Expiration	100	100.00%
4	Rhonchi / Wheezing	100	100.00%
5	Tightness of Chest	69	69.00%
6	Rhinitis	50	50.00%
7	Crepitations	24	24.00%
8	Headache	27	27.00%
9	Sleep disturbances	34	34.00%
10	Fever	09	09.00%

Chief complain and Associated symptoms - Amongst the 100 patients selected for the clinical trial all i.e., 100% suffered from dyspnoea cough, prolonged expiration and rhonchi/wheezing of varying degrees. Tightness of chest was reported in 69.00% of patients as an associated complaint followed by 50.00% rhinitis, sleep disturbances 34.00%. Headache 27.00%, crepitation 24.00%, 22.00% and fever in only 09.00%.

Table 2: Response of the Treatment on signs and symptoms after 90 days in 100 cases of bronchial asthma

S.No	Sign & Symptoms	Nos. of Patients		Percentage of relief
		BT	AT	
1	Dyspnea	100	18	82.00%
2	Cough	100	12	88.00%
3	Prolonged expiration	100	13	83.00%
4	Rhonchi/Wheezing	100	24	76.00%
5	Tightness of chest	69	16	76.81%
6	Rhinitis	50	16	68.00%
7	Crepitations	24	3	87.50%
8	Headache	27	4	85.18%
9	Sleep disturbances	34	6	82.35%
10	Fever	09	1	88.89%

In the study after 90 days of treatment, there is 88% reduction in cough, 83% in prolonged expiration, 82% in dyspnoea, 76.81% in chest tightness, 76% in wheezing/rhonchi, 68% in rhinitis, 87.5% in crepitation, 85.18% in headache, 82.35% in sleep disturbance and 88.89% in fever.

Table 3: Showing effect of treatment on Absolute Eosinophil Count (AEC) before and after 90 days in 100 patients of Bronchial asthma (N=100)

$\bar{x}$BT±SD	$\bar{x}$AT±SD	Mean Difference	SED	df	t value	P values	Interpretation
289.68±117.96	185.34±91.98	104.43	7.838	99	13.31	<.0001	H. significant

The effect of therapy on the score of AEC was calculated depending on the grading observed score before and after 90 days of treatment and the result obtained was highly significant. Before the treatment the mean of AEC was 289.68 with SD±117.96 and after the completion of the treatment the values decreased to 185.34 with SD±91.98. The mean difference was 104.43 and SD was 25.98 with t value 13.31 and p value is less than 0.0001 i.e., highly significant.

Figure-1

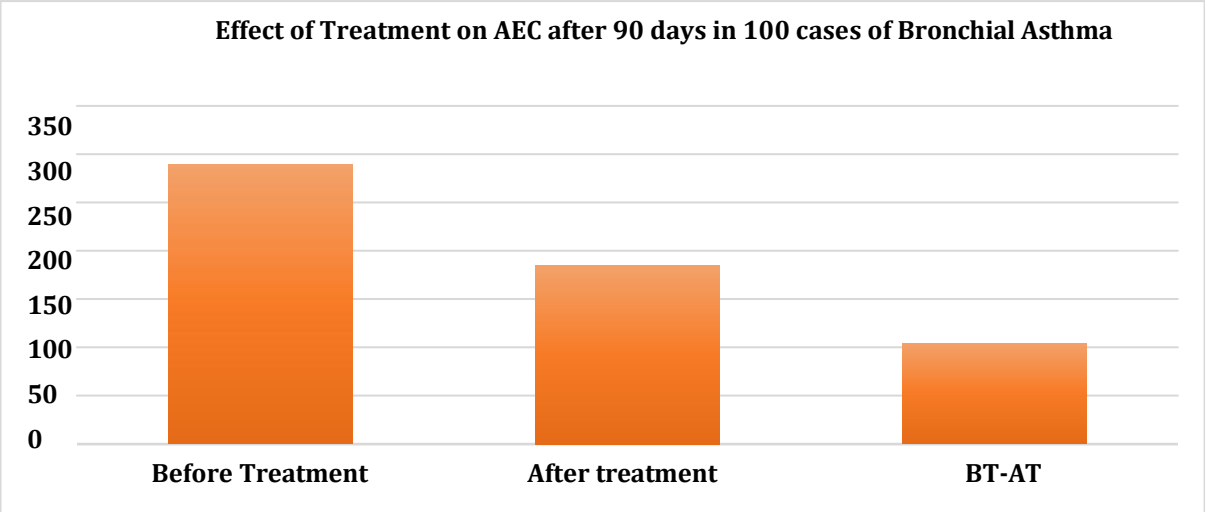
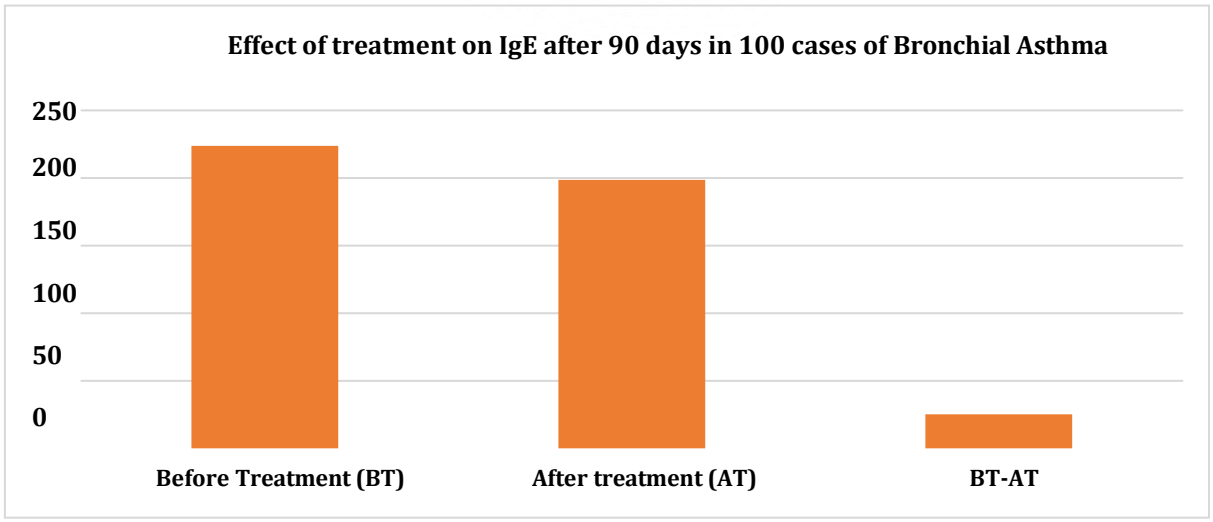


Table 4: Showing effect of treatment on Immunoglobulin E (IgE) before and after 90 days in 100 patients of Bronchial asthma (N=100)

x̄BT±SD	x̄AT±SD	Mean Difference	SED	Df	t value	P values	Interpretation
223.71±115.51	198.56±102.12	25.15	2.584	99	9.73	<.0001	H. significant

The effect of therapy on the score of IgE was calculated depending on the grading observed score before and after 90 days of treatment and the result obtained was highly significant. Before the treatment, the mean of IgE was 223.71 with SD±115.51 and after the completion of the treatment the values decreased to 198.56 with SD±102.12. The mean difference was 25.15 and SD was 13.39 with t value 17.1588 and p value is less than 0.0001 i.e., highly significant.

Figure-2



CONCLUSION

The present research work wants to conclude that *Drakshadi* syrup is found to be very effective in childhood bronchial asthma with significant improvement in AEC and IgE levels and also in objective parameters. The effect may be due to the immunomodulatory (Dean P, et al 2007), anti-histaminic (Pathak D, et al 1991), antiallergic & mast cell degranulation properties (Pathak D, et al 1991) activity of the drug component. No specific side effects of the *Drakshadi* syrup were observed during the trial period of 3 months. The *Drakshadi* syrup can be regarded as a non-steroidal, cost-effective, and safe drug that can be prescribed for childhood bronchial asthma.

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