

## Research Article

# Clinical study of recurrent respiratory tract illness among pediatric patients

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## ABSTRACT

**Background:** Pediatric respiratory tract illness is one of the most common reasons for physician visits and hospitalization and is associated with significant morbidity and mortality. Respiratory illnesses are common and frequent and present on EOF the major complaints in children and adolescents. Respiratory illness, mainly involving the upper airways, are common in children and their recurrence constitutes a demanding challenge for the paediatricians. There are many children suffering from so called recurrent respiratory illness (RRI). The objective was to study recurrent respiratory tract illness among pediatric patients

**Methods:** A Hospital based cross sectional study was carried out from March 2013 to February 2014 among 99 children aged between 6 months to 5 years of age at Kamineni Hospital, LB Nagar, Hyderabad, Telangana, India. Informed consent and approval of institutional ethical committee was taken prior to the study. Children with age less than 6 months and more than 5 years, children with congenital heart disease, children with cerebral palsy, and children with proven immunodeficiency disorder were excluded from the study. All parents were asked a detailed history of the child. Complete clinical examination was done for all children. They were subjected to blood investigations.

**Results:** Elevation of serum IgE levels was more (78.04%) in not exclusively breast fed as compared to those who were exclusively breast feed (27.58%) with p value of 0-0001. Out of 48 children with elevated serum IgE levels, 46 (53.48%) were born at term gestation and only 2 (15.38%) were preterm. This was statistically significant with p value of 0.01. Serum IgE levels were significantly elevated in 85% of children with family history of recurrent respiratory tract illnesses with p value of 0.001. 50% children with elevated eosinophils had elevated serum IgE levels with p value 0.93 which was not significant.

**Conclusions:** There was a significant role of family history of recurrent respiratory tract illness in children with elevated serum IgE levels. Serum IgE levels were elevated in 50% of the children with increased Eosinophils, but there was no significant correlation of percentage of Eosinophils and serum IgE levels.

**Keywords:** Clinical study, Recurrent respiratory tract illness, Pediatric patients

## INTRODUCTION

Pediatric respiratory tract illness is one of the most common reasons for physician visits and hospitalization

and is associated with significant morbidity and mortality. Respiratory illnesses are common and frequent and present on early oral feeding (EOF) the major complaints in children and adolescents. Respiratory illness, mainly involving the upper airways, are common

in children and their recurrence constitutes a demanding challenge for the paediatricians. There are many children suffering from so called recurrent respiratory illness (RRI). The child with RRI presents a difficult diagnostic challenge. It is necessary to discriminate between those with simply managed cause for their symptoms such as recurrent viral infections or asthma, from the children with more serious underlying pathology such as bronchiectasis or immune dysfunction. Recurrent infectious rhinitis is usually defined as more than five episodes per year and recurrent pharyngitis or tonsillitis more than three episodes within 12 months.<sup>1-3</sup>

Though the causes are multiple, it can be grouped into one of the following categories.<sup>4</sup>

1. RRI in normal children
2. RRI in atopic children
3. RRI in a child with chronic disease
4. RRI in immunodeficient child.

It is evident, that only a few appropriate tests are enough helpful to discriminate between a well-being child and a patient with immune dysfunction (Woroniecka, Ballow). It has been proposed that to diagnose RRI at least one of the following criteria has to be present (Gruppo di Studio di Immunologia della Societa Italiana di Pediatria in 1988):

- a.  $\geq 6$  respiratory infections per annum
- b.  $\geq 1$  respiratory infections per month involving upper airways from September to April
- c.  $\geq 3$  respiratory infections per annum involving lower airways

A certain group of children suffer from recurrent and prolonged respiratory tract infections for years. Although these diseases are often mild and self-limiting, the burden of being sick all the time can be unbearable for both the children and their parents. Defining frequently recurring respiratory infections is arbitrary, with many different descriptions being found in the literature. Beard et al defined infection prone children as those having six or more upper respiratory infections per year.<sup>5</sup> In other studies, frequently recurring respiratory infections has been defined as 4 to 12 episodes of upper respiratory infections per year.<sup>6-10</sup> In reality, respiratory infection rate in children from a continuum without segregation into infection prone and normal children.

Children tend to get more respiratory tract infections than adults because they have not yet build up immunity to the many viruses than can cause these infections. The role of physicians and other health care providers has expanded from merely treating disease to implementing measures aimed at health maintenance and disease prevention.<sup>1</sup>

There are many children suffering from so called recurrent respiratory infections. The child with recurrent respiratory infections presents a difficult diagnostic

challenge. It is necessary to discriminate between those with simply managed cause for their symptoms such as recurrent viral infections or asthma, from the children with more serious underlying pathology such as bronchiectasis or immune dysfunction. Many different disorders present this way, including cystic fibrosis, various immunodeficiency syndromes, congenital anomalies of respiratory tract, but in some children lung damage could follow a single severe pneumonia or can be the consequence of the inhalation of food or foreign body.<sup>11</sup>

## METHODS

### *Type of study*

It is a hospital based cross sectional study.

### *Sample size*

From outpatient and inpatients department of Pediatrics a total of 99 children aged between 6 months to 5 years of age were included in the study.

### *Place of study*

The study was conducted in Kamineni Hospital, LB Nagar, Hyderabad, Telangana, India.

### *Ethical consideration*

An Informed consent and approval of institutional ethical committee was taken prior to the study.

Only children in the age group of 6 months to 5 years having the symptoms of recurrent respiratory tract infections were included in the present study. Children with age less than 6 months and more than 5 years, children with congenital heart disease, children with cerebral palsy, and children with proven immunodeficiency disorder were excluded from the study. All parents were asked a detailed history of the child. Complete clinical examination was done for all children. They were subjected to blood investigations. The study was conducted from March 2013 to February 2014.

## RESULTS

Elevation of serum IgE levels was more (78.04%) in not exclusively breast feed as compared to those who were exclusively breast feed (27.58%) with p value of 0.0001.

Out of 48 children with elevated serum IgE levels, 46 (53.48%) were born at term gestation and only 2 (15.38%) were preterm. This was statistically significant with p value of 0.01.

**Table 1: Elevated serum IgE levels and exclusive breast feeding till 6 months.**

Exclusive breast feeding	No. of children with Elevated serum IgE levels	No. of children without Elevated serum IgE levels
Yes (n = 58)	16 (27.58%)	42 (72.41%)
No (n = 41)	32 (78.04%)	9 (21.95%)
Total (n = 99)	48	51

**Table 2: Elevated serum IgE levels and gestational age at birth.**

Gestational age	No. of children with Elevated serum IgE levels	No. of children without Elevated serum IgE levels
Term (n = 86)	46 (53.48%)	40 (46.51%)
Preterm (n = 41)	02 (15.38%)	11 (84.61%)
Total (n = 99)	48	51

Serum IgE levels were significantly elevated in 85% of children with family history of recurrent respiratory tract illnesses with p value of 0.001.

**Table 3: Elevated serum IgE levels and family history of RRTI.**

Family history	No. of children with Elevated serum IgE levels	No. of children without Elevated serum IgE levels
Positive (n = 20)	17 (85%)	03 (15%)
Negative (n = 79)	31 (39.24%)	48 (60.75%)
Total (n = 99)	48	51

50% children with elevated eosinophils had elevated serum IgE levels with p value 0.93 which was not significant.

**Table 4: Elevated serum IgE levels and eosinophilia.**

Eosinophil's	No. of children with Elevated serum IgE levels	No. of children without Elevated serum IgE levels
Elevated (n = 08)	04 (50%)	04 (50%)
Normal (n = 79)	44 (48.35%)	47 (51.64%)
Total (n = 99)	48	51

## DISCUSSION

In the present study, children born as preterm were less likely to have elevated serum IgE levels as compared to

those who were born at term gestation. These values are similar to a study by Siltanen et al in the study preterm birth reduces the atopy in adults showing 69% elevation of serum IgE levels in children born at term gestation.<sup>12</sup>

There was significant elevation of serum IgE levels (with p value of 0.001) in children with positive family history of recurrent respiratory tract illness. Our results are near to the study by Croner S et al which had family history of recurrent respiratory tract illness in 70% of the children.<sup>13</sup>

In this study, 50% of the children with increased eosinophils showed elevated serum IgE levels with p value of 0.93 which was not significant. This study was not in accordance with the study done by Ebrahim et al which showed significant correlation between serum IgE levels and eosinophils with p value of 0.001.<sup>14</sup>

A study by Rusconi F et al investigated the relation between total serum IgE levels at 0.5-3 and 3-6 years, and the risk of allergic sensitization and persistent wheezing up to 8 years of age.<sup>15</sup> They found that increased total serum IgE levels has been observed in association with acute viral infections in both atopic and non-atopic individuals.

A study of serum IgE levels and the clinical expression of respiratory illnesses by Stempel DA et al concluded that the incidence of wheezing illnesses was greater in children with elevated serum IgE levels.<sup>16</sup>

A study of atopy in preschool Italian children with recurrent respiratory infections by Dellepiane RM et al concluded that atopy is a frequent condition and it is likely to be a favouring factor for recurrent respiratory infections.<sup>17</sup>

## CONCLUSION

There was a significant role of family history of recurrent respiratory tract illness in children with elevated serum IgE levels. Serum IgE levels were elevated in 50% of the children with increased Eosinophils, but there was no significant correlation of percentage of Eosinophils and serum IgE levels.

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