Research Article

Prevalence and clinical profile of mycoplasma pneumoniae respiratory infection in children: a hospital based study

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ABSTRACT

Background: Mycoplasma pneumoniae (M. pneum) is a well-established cause of respiratory tract infections in the pediatric population worldwide. This study aimed to assess the prevalence and clinical profile of children with mycoplasma respiratory infection.

Methods: Design was prospective study. Departments of Pediatrics and Microbiology of Tertiary care Medical College. Study period was one year (Jan 2012 to Dec 2012). Children (age 3 months to 15 yrs) with respiratory tract infection symptoms of >5 days. Histories, physical examination, routine lab investigations of respiratory infection, IgM ELISA for Mycoplasma pneumoniae (M. pneum) were done. Treatment Initiated as per ARI guidelines with appropriate modifications. M. peum cases were additionally treated with azithromycin. Response assessed clinically and by investigations. Statistical analysis was done by chi-square and t-tests.

Results: Prevalence of M. pneum. respiratory infection was 22.44%. Clustering of positive cases was during the pre-monsoon and monsoon seasons. Fever, sore throat and consolidation revealed significant association with M pneu-infection clinically. High ESR and absence of leucko cytosis were the significant lab parameters of M. pneum positive cases. All positive cases responded to arithromycin. There was no mortality.

Conclusions: M. pneum contributes to 22.44% respiratory infections in hospital attending children. Fever, sore throat consolidation and high ESR are the significant suggestive parameters.

Keywords: Mycoplasma pneumoniae, Sorethroat, Consolidation, IgM ELISA, ESR, Azithromycin

INTRODUCTION

Mycoplasma pneumoniae (M. Pneum) is a well-established cause of respiratory tract infections in the pediatric population worldwide.[1] The peak incidence is seen in school aged children About 7 to 40% of all community acquired pneumonia in children from 3-15 yrs of age is reported to be due to this pathogen.[2]

Even though the prevalence of M pneum. respiratory infection is reported from children world over, studies from India are scanty.[3-7]

The diagnosis can be confirmed by serology which is easy, sensitive, rapid and less expensive. IgM ELISA is the most appropriate test but does not exclude immediate past infection and sub clinical illness. PCR test is more reliable, but is expensive and is not easily available.[9-12]

A specific diagnosis of M. pneum. etiology is crucial in treating respiratory diseases because the betalactam antibiotics empirically used for treating respiratory infections are ineffective against this pathogens.[13]

The present study was undertaken with the objectives to detect the prevalence and clinical profile of M. pneum respiratory infection in children.

METHODS

This was a prospective study conducted in the Departments of Paediatrics and Microbiology of a Tertiary Medical College hospital during the period from January 2012 to December 2012. Infants and children from 3 months to 15 yrs of age, having respiratory symptoms >5 days, attending the outpatient and inpatient departments were included in the study.

Exclusion criteria were age less than 3 months or above 15 yrs, respiratory symptoms less than 5 days duration, those treated with macrolide antibiotics in the last 5 days of illness, children suspected of hospital acquired respiratory infection ie within 72 hrs after admission/within 7 days of discharge, those having chronic respiratory, cardiac, renal or liver diseases, metabolic and immune deficiency disorders.

The study group was selected after getting ethical clearance and parents' consent. Detailed history and physical examination were done for all and the points were entered in a predesigned proforma. Clinical diagnosis was made as upper or lower respiratory infection according to WHO guidelines.[13] For all children complete blood count, ESR and IgM ELISA for M. pneum. were done. Additional investigations like chest skiagram and/or USG, tuberculin test, blood culture and sensitivity were performed for selected patients to rule out respiratory diseases with similar clinical presentation.

Serological test

2 ml blood was collected by venipuncture at the time of presentation for study enrolment. IgM titre of >1.1 for M. pneum. was considered to be positive as per recommendations of the manufacturer.

Treatment

Empirical antibiotic therapy was started as per WHO ARI guide lines.[13] Changes were made according to clinical response, radiological clearance and other investigation reports. M. Pneumoniae IgM positive patients having persistent respiratory symptoms were additionally treated with azithromycin.

Response to azithromycin was assessed clinically twice daily for inpatients and on alternate days for out patients till recovery. Fever, throat pain, cough and dyspnea were assessed by parental reporting and by objective examination. Radiological evaluation was repeated for those having severe pneumonia and pleural effusion. All inpatients were followed up 1 week after discharge.

RESULTS

Age and sex distribution

Ninety eight children fulfilling the inclusion criteria participated in the study. Of them mycoplasma IgM positivity was detected in 22 patients, revealing the prevalence rate of 22.4%. The median age range of the subjects was 13-60 months. The male female ratio in mycoplasma positive group was 1:1 whereas in the overall group the gender ratio was 0.8:1.

Seasonal distribution

Clustering the mycoplasma positive cases was observed to be from premonsoon to monsoon season (May to August) as shown in Figure 1.
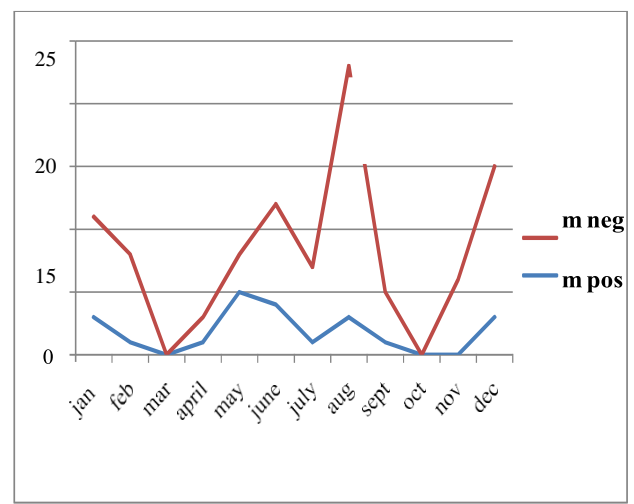

Figure 1: Seasonal distribution of M. pneum infection.

Symptoms

Feverand sore throat were the symptoms observed more in mycoplasma positive group revealing statistical significance (p value 0.017, 0.0015 respectively) (Refer Table 1).

Table 1: symptoms in M. Pneumonia respiratory infection.

symptoms	m pos (n=22)	m neg (n=76)	chi square	p value
Fever	21(95.5%)	54(71.1%)	5.65	0.017
Cough	19(86.4%)	72(94.7%)	0.76	0.38
Dyspnoea	6(27.3%)	39(51.3%)	3.06	0.08
Rhinnitis	10(45.5%)	38(50%)	0.141	0.707
Sore throat	4(18.2%)	0(0%)	10.15	0.0015
Rattling	1(4.5%)	25(32.9%)	7.035	0.008

Physical signs

On analysing the physical signs like temperature, respiratory rate and quality of breath sounds, bronchial breathing had statistically significant association with mycoplasma positivity (p value 0.000).

Laboratory criteria

Total leukocyte count (TLC) did not show elevation in mycoplasma positive groups compared to the negative group having statistical significance (p value 0.005) (Table 2). Mean ESR value in the mycoplasma positive group was 31.20 (SD 31.57) which was significantly higher compared to the negative group by 't' test (t2, 001, p value 0.048).

Table 2: Blood counts observed in the study group.

Blood counts		M pos (n 22)	M neg (n 76)	Chi square	P value
Total Count	Normal	21 (95.5%)	44 (57.9%)	10.78	0.005
	Increased	1 (4.5%)	30 (39.5%)		
	Decreased	0	2(2.6%)		
Polymorphic predominance		13 (59%)	31 (40.8%)	1.63	0.2017
Lymphocytic predominance		9 (40.9%)	44 (57.9%)	0.02	0.88

Chest skiagram

Radiological evidence of consolidation (40.9%) was significantly higher in the mycoplasma positive group (p value 0.009) whereas hyperinflation was in favour of non mycoplasmal etiology (p value 0.0053). Two children with M. pneums had associated pleural effusion but were not statistically significant by fishers' exact test (p 0.125).

Outcome

All the M. pneum positive patients treated with arithromycin had good outcome revealing subjective and objective improvement by 48 hours. There was no mortality. The average length of hospital stays was 4.59 days (SD 4.1).

DISCUSSION

In the present study, the prevalence of mycoplasma infection among children with respiratory infection was found to be 22.44%. This data is comparable with the other Indian studies like Kashyap et al, Choudhury R et al Kabraetal SK revealing 21.3%, 24% and 27.4% respectively.[5,7,14]

The mean age of the patients with mycoplasma respiratory infection was 13-60 months SD (50.45).

(SD 50.45) with a gender ratio (M:F) of 0.8:1 in the study group and 1:1 in the mycoplasma positive group. Both these were comparable with other studies.[5,8]

On analysing the clinical profile of patients, 95.5% (21/22) mycoplasma positive cases had complained of fever, even though recorded fever was observed only in 63.7% of this group (14/22). This was statistically significant (p-value 0.017) such as observation was not perceived by other study groups.

Sore throat was found to be a significant symptom in M. pneum positive group in the present study and in Kashyap et al study with p-values 0.0015 and <0.05 respectively.[5]

Absence of leucocytosis in was observed in the present and Youn et al study. [8]There was no statistical significance for the same in the present study may be due to small sample size.

In the present study, consolidation was observed in 40.9% of mycoplasma positive group which was statistically significant (p value 0.0029).

A limitation of the study was, our study sample was small. Also estimation of PCR as well IgG ELISA for M pneum. would have improved the subjects group.

What this study adds

Mycoplasma pneumonia is a predominant cause for respiratory infection in children prevalence being 22.4%.

Fever, sorethroat and consolidation are significant respiratory manifestations of M pneumonia. Normal leucocyte count and high ESR (>30 mm/hr) are significant routine lab findings in M pneumonia infection.

CONCLUSION

To conclude, the prevalence of M. pneum respiratory tract infection in pediatric population attending hospital is 22.44% and fever, sore throat and consolidation are significant clinical manifestations.

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