Brief Reports

Sero-prevalence of Chlamydia Infections in Under Five Children

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Chlamydia trachomatis infections are the most prevalent of all sexually transmitted diseases and can be transmitted to the neonate during the birth process(l). C. *trachomatis* is now well established as a pathogen for neonatal inclusion conjunctivitis and pneumonia in infants. C. *pneumoniae* (TWAR) and *C. psittaci* also cause pneumonia and other respiratory infections (2). In this study, we present our observations regarding sero-prevalence of chlamydial infections amongst the neonates and children between one month and five years of age.

Subjects and Methods

Three hundred and ninety eight children between 0 to 5 years of age were randomly surveyed from the nursery, Pediatric wards and the Pediatric Out Patient Department between April 1994 to December 1994. A micro-fluorescence assay for IgG was utilized for the sero-diagnosis of chlamydial infections.

The children were divided into two groups. Group A included 182 unselected term neonates born at AIIMS hospital and Group B included 216 children between 1 month and 5 years attending children's Out Patient Department. The blood sample was collected on a sterile sponge after a heel prick or veni-puncture, which was eluted for estimation of antibody titers. Detailed clinical information including a past history of neonatal conjunctivitis and pneumonia was recorded. Determination of antibodies to chlamydia species, *i.e, C. trachomatis* all 15 serovars, *C. psittaci* and C. *pneumoniae* (TWAR) by a micro-immuno fluorescence assay for the species specific IgG was carried out using a cluster of 6 pooled antigens including a control, *i.e., C. trachomatis* A-C, D-K, L1-L3, *C. psittaci* (representative strain) and *C. pneumoniae* (representative strain) and a negative control. The sera were tested with a starting dilution of 1:16 and readings were taken under a fluorescent microscope. The reciprocal dilution of blood showing a positive fluorescence, *i.e.,* bright apple green particles was taken as the antibody titer. A micro-immunofluorescence assay was used for sero-diagnosis of chlamydia infections because it detects type specific antibodies against individual chlamydial agents or groups of chlamydial agents with similar clinical and/or epidemiological features and the sensitivity and specificity is high. The sensitivity of other serological tests based on using a single antigen which detect group-specific antibody is good but the specificity is low because of false positive values.

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Received for publication: December 21,1995; Accepted: April 3,1996

TABLE I—*Characteristics of Study Population*

Group	Number studied	Chlamydial infection	NN Conjunctivitis	Pneumonia	Nasopharyngeal infection
A	182	8 (4.4)	2	1	–
B	216	3 (1.4)	7	15	67
Total	398	11 (2.8)	9	16	67

Figures in parentheses indicate percentages.

Specific IgG titer in a single sample of blood for the provisional diagnosis of active infection was considered as follows: *C. **trachomatis*** 1:64, *C. pneunoniae* 1:128 and *C. psittaci* 1:64. The antibody titres were measured for each of the species of chlamydiae.

Results

One hundred and eighty two neonates included in Group A were tested. Eight (4.4%) of the neonates tested had significant titers for chlamydia *(Table I).* The titers of IgG antibodies against different strains of chlamydiae are shown in *Table II.*

Two hundred and sixteen children aged between 1 month to 5 years included in Group B were tested. Three (1.4%) of the infants and children tested had significant antibody titers against chlamydia *(Table I).* Of the total 398 children tested between 0-5 years, 2.8% had positive titers for chlamydia. The titers of IgG antibody against chlamydia are shown in *Table III.* Three children (two with nasopharyngeal infection and one with pneumonia) out of 67 who had acute upper respiratory infection had significant titers for chlamydial infection *(Table IV).* Conjunctivitis by history or physical examination or both was recorded in 2.3% of children under 5 years of age who were positive for chlamydial infections.

Discussion

C. trachomatis IgG antibodies were found in 3.3% of neonates and 0.46% of children between 1 month and 5 years of age. Its incidence has been reported to be 8.2/ 1000 live births in infancy(2). Four to five per cent of sexually active women have chlamydial infection. It is transmitted to the neonate in a quarter of pregnancies complicated by this orgnaism(2). Infants born to women with chlamydial infection are at 60 to 70% risk of acquiring the infection during passage through the birth canal(3,5). There is 20-50% risk of development of neonatal conjunctivitis and 10-20% risk of developing pneumonia in infancy among offsprings of women suffering from

TABLE II—*Neonates with Positive Chlamydia Titers (n=182)**

Serotype	Type specific antibody titers		
	1: 16	1:164	1:128
1. C. *trachomatis*			
A-C	2	2 (1.64)	1
D-K_	-	1 (0.549)	-
L1-L3	-	2 (1.098)	-
2. *C. pneumoniae*	13	4	1 (0.549)
3. *C. psittaci*	-	1 (0.549)	-

* Signify seroprevalence of pregnant women rather than active neonatal infection.

TABLE III–*Positive Chlamydia Titers in Children Between 1 month and 5 years (n=216).*

Agent	Type specific antibody titers			% with
	1:16	1:64	1:128	+ve titer
1. *C. trachomatis*				
A-C	1	1	–	0.46
D-K	1	–	–	
L1-L3	1	–	–	
2. *C. pneumoniae*	8	4	2	0.94
3. *C. psittaci*	1	–	–	

TABLE IV–*Clinical and Laboratory Findings in 11 Children with Chlamydia Infection.*

Case No.	Age	Sex	Clincial presentation	Serum antibody titre
1.	1 d	F	–	1:64 *C. trachomatis* A-C
2.	3 d	F	–	1:64 *C. trachomatis* A-C
3.	1 d	M	–	1:128 *C. pneumoniae*
4.	3 d	F	–	1:64 *C. psittaci*, *C. trachomatis* A-C, D-K L1-L3.
5.	1 d	F	–	1:64 *C. trachomatis* D-K
6.	1 d	F	–	1:64 *C. trachomatis* L1-L3
7.	2 d	M	–	1:64 *C. trachomatis* L1-L3
8.	1 d	M	–	1:128 *C. trachomatis* A-C
9.	5 yr	M	Nasopharyngeal infection	1:64 *C. trachomatis* A-C
10.	3 yr	F	– do –	1:128 *C. pneumoniae*
11	9 mo	M	Pneumonia	1:128 *C. pneumoniae*

chlamydial infection(6). In our study, presence of IgG antibodies against C. *trachomatis* during early neonatal period is a reflection of seroprevalence of chlamydial infection among pregnant women rather than active infection in the neonates. We did not follow newborn babies for development of chlamydial infection during early infancy.

While respiratory tract infections in children most commonly occur due to bacterial or viral pathogens, some infants do have symptoms involving the upper or lower respiratory tract or both due to chlamydial infection(7). Respiratory infections in the first four months are frequently caused by *C. trachomatis(8).* Conjunctivitis is reported in less than half

of the chlamydia positive infants in western series(9). Conjunctival infection may lead to upper respiratory tract colonization but may not be associated with or lead to pneumonia syndrome clinically(l0).

C. pneumoniae infection was seen in 0.55% of neonates and 0.94% of children between 1 month and 5 years of age. Sero-prevalence of C. pneumoniae in asymptomatic children has been reported to be between 23.1% in children between 6 months to 10 years rising to 66.7% in teen-agers(ll). C. *peumoniae* does not appear to be an important lower respiratory tract pathogen in young infants, with an inverse relationship between titer and chronological age(12).

In conclusion, our data indicate that the sero-prevalence of chlamydial antibodies (2.8%) is low and there appears to be no significant correlation between upper respiratory tract symptoms and chlamydial infections in our study population. However, further prospective studies from India are warranted to confirm these observations.

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