

COMPARISON OF BLOOD LEVELS OF ANTICHLAMYDIA TRACHOMATIS ANTIBODIES AMONG MOTHERS AND THEIR NEWBORN BABIES FOLLOWING NORMAL DELIVERIES VERSUS MOTHERS AND NEWBORN BABIES FOLLOWING CESAREAN SECTION

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Abstract:

Background: A number of studies have demonstrated that chlamydia trachomatis plays a prominent role in disorders of the human reproductive system.

Objective: This study was carried out to determine antibody levels of Chlamydia trachomatis among mothers with either normal deliveries or had cesarean section and their newborn babies, and the effect of various epidemiological, obstetric, and medical factors on antibody levels among the studied groups.

Method: Serum specimens from 166 women with normal deliveries and their babies (group one) and 32 women with cesarean section and their babies (group two), were screened for C. Trachomatis antibodies by Micro ELISA method.

Result: C. Trachomatis infection rate was 24% and 20.5% among women and babies in-group one,

while it was 40.6% and 38.1% in-group two. History of bleeding (significant negative correlation), discharge and urinary tract

Infection (significant negative correlation) during pregnancy, weight of newborn, had higher rate among group two, while fever and anemia during pregnancy, number of previous abortions were higher among women in group one.

Conclusion: Chlamydia trachomatis infection rate was higher among women and their babies following cesarean section than among those with normal delivery.

Keyword: chlamydia trachomatis antibodies in women after delivery

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Introduction

Chlamydia trachomatis is an obligate intracellular parasite that was once thought to be a virus. It has discrete cell walls that resemble Gram-negative bacteria and responds to antibiotic therapy¹. The Center for Disease Control (CDC) in Atlanta estimates that 3 million people are infected annually, with 75% of infected women

having few or no recognized symptom². The increasing incidence of Chlamydia infection in the community has been well documented, along with an increase in cases of neonatal Chlamydia³. Prenatal implications of Chlamydia infection for the mother and newborn include associations with ectopic pregnancy, spontaneous abortion, preterm labor, amnionitis, premature rupture of membranes, low birth weight, prematurity, still birth, and neonatal death⁴. Women with Chlamydia during pregnancy are also more likely to develop intrapartum fever and or late onset postpartum endometritis after vaginal delivery⁵. Vertical transmission of C. trachomatis to the neonate occurs in approximately 50% of cases⁴, maternal-

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infant transfer of this disease occurs in approximately 23 to 70% of infants born to infected mothers, there are also rare cases of *C. trachomatis* infections in infants born by cesarean section⁴. For the newborn of untreated mothers, inclusion conjunctivitis occurs in 11%-44% of cases, and pneumonia occurs in 11-20% of cases. Furthermore, *C. trachomatis* in infancy has also been associated with otitis media, broncholitis, pharyngitis, rhinitis and gastroenteritis⁶.

Screening for *C. trachomatis* in pregnancy is considered best practice internationally for detecting and subsequently treating Chlamydia infection in pregnant women, and reducing the associated morbidity^{7, 8}. This study was carried out to determine antibody levels of *C. trachomatis* among mothers with either normal deliveries or had cesarean section and their babies, and the effect of various epidemiological factors on antibody levels among the studied groups

Subjects and Method

A cross sectional study was designed in which the study sample was divided into two groups, group one included 166 mothers with normal vaginal deliveries and their newborn babies, group two included 32 mothers delivered by cesarean section and their babies. Data on the demographic and socioeconomic status of the family, medical and obstetric history of the mother during pregnancy was obtained through well-structured questionnaire form. Both groups were collected from Al-Kadhimiya teaching hospital during the period December 2004- July 2005.

Blood samples obtained from both mothers and babies to measure antichlamydia trachomatis antibody levels via micro ELISA technique.

Standardization procedures were carried out for the antigen (*Chlamydia* antigen from Virion), conjugate (Antihuman IgG Fab specific, peroxidase conjugate, Sigma) and antisera, and the optical dilutions were found to be 1/10, 1/500 and 1/2

respectively. ELISA test was used following the WHO standard method⁹ using the above antigen in proper concentration for coating microwells as a solid phase.

The antibody levels to *C. trachomatis* (absolute optical density values) were divided into the following groups¹⁰.

- Negative: < 0.91
- Equivocal: 0.91- 1.09
- Positive: > 1.09

Analysis of data was done using SPSS statistical program version 10.0 to obtain frequencies, percentages. t test of significant was used. P value of ≤ 0.05 was considered significant

Result

Percentage of low level of antichlamydia antibodies (< 0.91) was higher in the group of mothers with normal delivery and their newborn babies than with cesarean section (76.0%, and 79.5% versus 59.4 and 71.9%), while it was the reverse for antibody levels of more than 1.09 (12.0% and 12.0% versus 21.8% and 15.6%). There were no significant differences between mothers and their babies in the two groups table 1. The study showed that history of bleeding during pregnancy was positive in 4.2% of women in first group and 6.3% in the second group, vaginal discharge and fever during pregnancy were 5.4%, 6.6% and 9.4%, 3.1% respectively. Urinary tract infection during pregnancy shows higher percentage (21.9%) among women with cesarean section (group two) than those with normal delivery (10.8%), anemia during pregnancy was higher among women in group one 24.7% than among those in group two (12.5%). The study also shows that 7.8% and 3.1% of babies have weight < 2.5 kg among group of normal delivery and cesarean section respectively table 2.

History of urinary tract infection and vaginal bleeding during pregnancy shows negative and significant correlation with Chlamydia antibody levels only in the second group table 3.

Table (1): Distribution of serum level of antichlamydia trachomatis antibodies among group of mothers and their newborn babies following normal vaginal deliveries and cesarean section

Anti-chlamydia antibody	Normal vaginal delivery		Cesarean section		Significant
	Frequency	Percent	Frequency	Percent	
Mothers					X ² =3.77 DF= 4 P=
< 0.91	126	76.0	19	59.4	
0.91-1.09	20	12.0	6	18.8	
> 1.09	20	12.0	7	21.8	
Total	166	100.0	32	100.0	
Babies					X ² =0.98 DF= 4 P=
< 0.91	132	79.5	23	71.9	
0.91-1.09	14	8.5	4	12.5	
> 1.09	20	12.0	5	15.6	
Total	166	100.0	32	100.0	

Table (2): Distribution of sample of mothers following normal vaginal deliveries and cesarean section according to some medical, obstetric problems and outcomes of pregnancy

Variables	Normal deliveries		Cesarean section		Significant
	Freq	Percent	Freq	Percent	
Age					X ² =9.79 DF= 1 P < 0.01
<25	80	48.2	12	37.5	
≥25	86	51.8	20	62.5	
Bleeding\pregnancy					X ² =0.97 DF= 1 P > 0.05
Yes	7	4.2	2	6.3	
No	159	95.8	30	93.8	
Total	166	100.0	32	100.0	
Discharge\pregnancy					X ² = 1.14 DF= 1 P > 0.05
Yes	9	5.4	3	9.4	
No	157	94.6	29	90.6	
Total	166	100.0	32	100.0	
Fever\pregnancy					X ² = 1.06 DF= 1 P > 0.05
Yes	11	6.6	1	3.1	
No	155	93.4	31	96.9	
Total	166	100.0	32	100.0	
Number of previous deliveries					X ² = 0.18 DF= 1 P > 0.05
0 pregnancy	62	37.3	12	37.5	
1 -2	59	35.5	11	34.4	
> 3.0	45	17.2	9	28.1	
Total	166	100.0	32	100.0	

Number of previous abortion	138	83.2	23	71.9	$X^2 = 4.92$ DF= 2 P < 0.05
0 abortion	18	10.8	8	25.0	
1 -2	10	6.0	1	3.1	
3+	166	100.0	32	100.0	
Total					
URI \pregnancy					$X^2 = 1.75$ DF= 1 P > 0.05
Yes	18	10.8	7	21.9	
No	148	89.2	25	78.1	
Total	166	100.0	32	100.0	
HB g/dl level\pregnancy					$X^2 = 7.14$ DF= 1 P < 0.01
> 33	41	24.7	4	12.5	
≤ 33	125	75.3	28	87.5	
Total	166	100.0	32	100.0	
Weight of newborn					$X^2 = 0.34$ DF= 1 P > 0.05
≥ 2.5	153	92.2	31	96.9	
< 2.5	13	7.8	1	3.1	
Total	166	100.0	32	100.0	
Gestational age					-----
≥ 37 weeks	151	91.0	32	100.0	
< 37 weeks	15	9.0	---	---	
Total	166	100.0	32	100.0	

Table (3): Comparison result of correlation test using antichlamydia antibodies level and different demographic, socioeconomic, medical and obstetrics problems among mothers and their babies with normal deliveries and with cesarean section

Variables	Normal deliveries		Cesarean section	
	Mothers	Babies	Mothers	Babies
Age\years				
P. Correlation	.039	.099	.314	.251
Significant	.621	.203	.080	.166
Number	166	166	32	32
Residency				
P. Correlation	-.014	.015	.179	.108
Significant	.861	.846	.327	.558
Number	166	166	32	32
Mother\education				
P. Correlation	-.067	-.117	-.065	-.036
Significant	.389	.133	.725	.845
Number	166	166	32	32
Crowding index				
P. Correlation	.098	.161*	.328	.279
Significant	.209	.039	.066	.121
Number	166	166	32	32
Bleeding\ pregnancy				
P. Correlation	-.022	-.062	-.353*	-.423*
Significant	.774	.427	.048	.016

Number	166	166	32	32
Discharge \ pregnancy				
P. Correlation	.066	.065	.053	-.035
Significant	.396	.404	.775	.850
Number	166	166	32	32
Fever\Pregnancy				
P. Correlation	.058	-.081	.081	.097
Significant	.461	.300	.658	.598
Number	166	166	32	32
Number of previous deliveries				
P. Correlation	.020	.137	-.315	-.191
Significant	.801	.078	.079	.295
Number	166	166	32	32
Number\abortion				
P. Correlation	.092	.048	.004	-.083
Significant	.237	.542	.981	.652
Number	166	166	32	32
UTI\pregnancy				
P. Correlation	-.032	-.035	-.643**	-.470**
Significant	.681	.656	.000	.007
Number	166	166	32	32
Weight of newborn				
P. Correlation	-.127	-.136	-.179	-.145
Significant	.103	.081	.326	.427
Number	166	166	166	32

Discussion

Chlamydia trachomatis infection showed higher rate of infection and higher levels of antibody titers among women and their newborn babies in group two than those in group one. Popovich DM et al ¹ 2004 suggested that perinatal transmission usually occurs via vaginal delivery, but infection can also occur secondary to ruptured fetal membrane, directly contaminated the infant's nasopharynx and lungs, there also cases of C. Trachomatis infection in infants born by cesarean section. The finding in the present study could possibly be due to obstetric problems and early rupture of membrane that lead to performance of cesarean section in the studied group, further studies is needed to confer this finding and a larger group of pregnant women in labor is needed.

The finding of increase percentage of women with history of vaginal bleeding, discharge and urinary tract infection during pregnancy (significant correlation for

vaginal bleeding and UTI) among women exposed to cesarean section than those with normal vaginal delivery agreed with the study done in USA and published by the American Social Health Association ¹¹. Babies born with low birth weight (<2.5 kg) represented 7.8% of babies in group one and 9.0% of them were born before 37 weeks of gestation, C. trachomatis infection has been associated with intrauterine growth restriction and prematurity ^{12, 13}, this percentage was less among babies of mothers with cesarean section, this possibly explained by the fact that the number of women in group two was small. A study done in Hungary found that Chlamydia infection was a significant predictor of low birth weight ¹⁴. The finding of no significant association between weights of newborn with Chlamydia trachomatis infection is in agreement with some studies ^{15, 16}, and disagreed with other studies ^{12, 17, 18}.

Conclusion and recommendation: Chlamydia trachomatis infection rate was higher among women and their babies following cesarean section than among those with normal delivery, the antibody levels show significant and negative correlation with history of bleeding and UTI during pregnancy. These finding highlight the need for a routine antibody testing of C. Trachomatis, treatment of women during pregnancy and also advocating for newborn assessment and treatment to reduce the significant, yet preventable morbidity associated with C. Trachomatis infection in both mothers and neonates.

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