Chlamydia Trachomatis and Rubella Antibodies among two Groups of Mothers and Their Newborn Babies in Baghdad City

Enas Talib Abdul- Karim* **PhD**

Nidhal Abdul-Muhymen** **PhD**

Tara S Al-Chrmawindi*** **MSc**

Abstract:

Objective: This study was conducted to determine the sero-prevalence of rubella and Chlamydia trachomatis antibodies among group of women at time of their deliveries (normal vaginal and cesarean section) in University hospital\ Al-Kadhimyia in Baghdad city.

Method: Serum specimens of 151 women with vaginal deliveries and 32 women with cesarean section and their babies were screened for rubella and chlamydia Trachomatis antibody levels by Mico ELISA method.

Results: Chlamydia infection rate were higher among women with cesarean section and their newborn babies than among women with normal deliveries and their babies (40.6%, 25.2% and 28.1%, 21.9% respectively). Also, weak antibody levels were found among women with cesarean section and their newborn babies than among women with normal deliveries and their babies (71.9%, 53.6% and 68.8%, 52.3% respectively).

Conclusion and recommendation: Both Chlamydia infection rate and rubella sero-negative antibodies were found to be higher among women and their babies following cesarean section than the group of women with normal deliveries and their babies. These finding highlight the need to instigate routine antibody testing for C. Trachomatis in pregnancy, and the need for rubella screening test for pregnant women at their first prenatal visit with standing orders for rubella vaccination after delivery together with reinforcement of rubella vaccination program

Keywords: Chlamydia trachomatis, rubella antibodies, mothers, newborn

Introduction:

Chlamydia is a very common sexually transmitted disease (STD) in sexually active adolescents and young adults, this organism usually affects the cervix and the fallopian tubes of the female, and the urethra in males [1], the bacteria target the cells of the mucous membranes which are the soft tissues of the body not covered by skin [2]. Chlamydia is known as the silent disease because approximately 85% of females and 40% of males do not have any symptom [3]; if symptoms are present they are similar to symptoms of gonorrhea and run the risk of being clinically misdiagnosed [4]. The untreated infection in pregnant females can cause premature births, and it can be passed to the baby during childbirth [5, 6]. Chlamydia prevention should be directed toward young women with increased screening efforts to identify those who are not exhibiting any symptoms [7, 8].

Rubella infection is generally an asymptomatic childhood disease but during the first trimester of pregnancy often leads to fetal death or severe congenital defect (congenital rubella syndrome, CRS) [9]. While the inclusion of rubella vaccination into routine childhood immunization will decrease rubella virus circulating among young children, it will not have immediate impact on the transmission of rubella among adults or the occurrence of CRS [10]. Worldwide, it is estimated that there are more than 100,000 infants born with congenital rubella syndrome (CRS) each year [11]. Numerous cases of congenital rubella syndrome due to rubella reinfection have been reported [12], all involved exposure to rubella in the first trimester of pregnancy after both natural and vaccine-induced immunity, usually with subclinical infection in the mother. The immune response may involve more than humoral immunity, but it is clear that rubella antibodies decline over time and may increase the risk of reinfection [13].

The purpose of this study is to determine the level of C. Trachomatis and rubella antibodies among women and their newborn babies with normal vaginal deliveries and among another group of women and their babies with cesarean section in one area in Baghdad city using ELISA test

Materials & Subject:

The study sample was divided into two groups, group one includes 151 mothers with normal vaginal deliveries and their newborn babies, group two include 32 mothers delivered by cesarean section and their babies. Data obtained from the mothers through well-structured questionnaire form. Blood obtained from both mother and babies to measure chlamydia trachomatis and rubella specific IgG antibody levels via micro EIISA technique. Both groups were taken from the University hospital\ Al-Kadhimyia during the

period from December 2004- July 2005. Blood obtain from both mothers and babies to measure chlamydia trachomatis and rubella specific IgG antibody levels via micro EIISA technique.

Standardization procedures were carried out for the rubella antigen (Rubella Ag from Virion) and Chlamydia antigen (Chlamydia Ag from Virion), conjugate (Antihuman IgG Fab specific, peroxidase conjugate, Sigma), and antisera, the optical dilutions were found to be 1/10, 1/500, 1/2 respectively, ELISA test was used following the WHO standard method [14] using the above antigen in proper concentration for coating microwells as a solid phase.

Sample values that lie below the cut-off value (mean negative +2SD) were considered negative, and those that were equal to or greater than cut-off value were considered positive. For rubella, because we did not have the reference standard to express the results in International units, the antibody levels to rubella (absolute optical density values) were divided into the following groups [15].

- Less than 1.00 = weak positive
- 1.00 -1.99 = positive
- Over 2.00 = strong positive

The antibody levels to C. trachomatis (absolute optical density values) were divided into the following groups [16].

- Negative: < 1.09
- Equivocal: 1.09-2.00
- Positive: > 2.00

Analysis of data was done using SPSS statistical program to obtain frequencies, percentages, t- test of significant, P value of < 0.05 was considered significant

Result:

Chlamydia infection rate were higher among women with cesarean section and their newborn babies than among women with normal deliveries and their babies (40.6%, 25.2% and 28.1%, 21.9% respectively) (Table 1). Also, higher levels of weak antibody were found among women with cesarean section and their newborn babies than among women with normal deliveries and their babies (71.9%, 53.6% and 68.8%, 52.3% respectively) (Table 2). There were no significant differences between mean antibody levels for both Chlamydia and rubella among mothers and their babies in each group, and between women and their babies with normal deliveries and those with cesarean section (Table 2).

Table (1): Distribution of blood level of *Chlamydia trachomatis* and rubella antibodies among group of mothers and their newborn babies following normal deliveries and cesarean section

Variables	Normal vaginal deliveries		Cesarean section	
	No	%	No	%
Chlamydia antibody levels\ mothers				
Negative	113	74.8	19	59.4
Equivocal	18	11.9	6	18.8
Positive	20	13.3	7	21.8
Total	151	100.0	32	100.0
Chlamydia antibody levels\ babies				
Negative	118	79.1	23	71.9
Equivocal	13	8.6	4	12.5
Positive	20	13.3	5	15.6
Total	151	100.0	32	100.0
Rubella antibody levels\ mothers				
Weak + ve	81	53.6	23	71.9
Positive	41	27.2	5	15.6
Strong positive	29	19.2	4	12.5
Total	151	100.0	32	100.0
Rubella antibody levels\ babies				
Weak + ve	79	52.3	22	68.8
Positive	42	27.8	5	15.6
Strong positive	30	19.8	5	15.6
Total	151	100.0	32	100.0

Table (2): Comparison between Chlamydia & rubella antibody levels among group of mothers and their newborn babies with normal deliveries and cesarean section

Variables	Normal deliveries	Cesarean section	Significant
Chlamydia antibody levels\ mothers			
Mean	0.985	1.197	t= 1.02
Minimum	0.000	0.210	P > 0.05
Maximum	3.110	3.000	
STD*	0.780	0.822	
ST Error**	0.064	0.144	
Chlamydia antibody levels\ babies			
Mean			
Minimum	0.930	1.049	
Maximum	0.000	0.110	t= 0.57
STD*	3.100	2.91	P > 0.05
ST Error**	0.805	0.81	
	0.065	0.144	
	t= 0.43	t= 0.51	
	P > 0.05	P > 0.05	
Rubella antibody levels\ mothers			
Mean	1.245	0.960	
Minimum	0.060	0.050	t= 1.47
Maximum	3.100	2.670	P > 0.05
STD*	0.820	0.722	
ST Error**	0.066	0.128	
Rubella antibody levels\ babies			
Mean	1.269	0.977	
Minimum	0.010	0.100	t= 1.4
Maximum	3.100	3.100	P > 0.05
STD*	0.848	0.790	
ST Error**	0.069	0.140	
	t= 0.19	t= 0.06	
	P > 0.05	P > 0.05	

***= Standard deviation**
****= Standard error**

Discussion:

The rate of antibody levels to Chlamydia trachomatis among mothers in both groups (40.6%, 25.2%) and their newborn babies (28.1% and 21.9%) were much higher than the result obtained in other studies, for example Paul VK in India [17] found the infection rate was 18.6%. the rate was 5.9% in Hungary [18], In USA and Canada the rate varied from 5% to 20% [19], it is estimated that vertical transmission of Chlamydia trachomatis to the neonate occurs in approximately 50% of cases [20], and nearly two-third of infants born vaginally to mothers with chlamydia become infected during delivery [21]. Popovich DM et al [22] 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. In the present study the antibody levels were higher among group of mothers and their babies in the second group than those among the first group, this 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.

As for rubella antibody levels 53.6% of women in group one and 71.9% of women in group two were seronegative with relatively similar rate among their babies, this result is much higher than the result obtained by Turgut et al [10] 2004 in Turkey, their rate of seronegative rubella antibodies was 17.2% among pregnant women, In our country rubella vaccination had been adapted in the MMR vaccine and for school girls, but there is no vaccination program for adult women or serological testing for rubella antibodies for pregnant women, our results are very striking one and might indicate improper vaccination, it is also clear that rubella antibodies decline over time and may increase the risk of reinfection [12], in a study involving Korean children 18.8% of those who had been vaccinated and 13.8% of those with natural immunity were found to be seronegative for rubella virus after 3 years, an Italian study shows that 9.8% of vaccinated girls were reinfected by wild-type rubella virus within 5 years [13]. Obstetricians should always check rubella serologies in women of reproductive age if they have been vaccinated, rubella serology should also be checked in all pregnancies even if the patients were seropositive during their prior pregnancies [23].

Conclusion and recommendation: Both Chlamydia infection rate and rubella seronegative antibodies were found to be higher among women and their babies following cesarean section than the group of women with normal deliveries and their babies.

These finding highlight the need to instigate routine antibody testing for C. Trachomatis in pregnancy, and the need for rubella screening test for pregnant women at their first prenatal visit with standing orders for rubella vaccination after delivery together with reinforcement of rubella vaccination program

References:

1-"*Chlamydia trachomatis*;" 2004. Well-net.com. http://www.well-net.com/STD/Chlamydia.html Accessed 2006

2-"Chlamydia Fact Sheet;" 26 January 2006. Centers for Disease Control and Prevention. May 2004. http://www.cdc.gov/std/chlamydia%20/STD Fact-chlamydia.htm Accessed 2006

3-"Sexual Health: Chlamydia. 26, January, 2006. Web MD Medical Reference.

4-"Chlamydia: Learn about STIs/STDs". 26 January, 2006. American Social Health Association. 1999-2006.www.ashastd.org/learn/learn Chlamydia

5-"Chlamydia: Health Matters" 26 January 2006. National Institute of allergy and Infectious Diseases- National Institute of Health. July 2005

6-CDC. Recommendations for the Prevention and Management of Chlamydia trachomatis Infections, 1993. MMWR 1993; 42 (RR-12)

7-Challenges and Opportunities: Action Agenda for Chlamydia, Prevention and Control in California: A Five Year Plan. January 1999. http://www.ucsf.edu/

8-National Coalition of STD Directors, April 23, 2002: Testimony, submitted to the United States House Subcommittee on labor, Health and Human Services and Education and Related Agencies, Committees on Appropriations, retrieved April 21, 2006. http://www.ncsddc.org/

9-Gershon A.A. rubella virus (Germen measles). In Mandel GL, Bennet JE, Dolin R. Mandel, Douglas and Bennet's principles and practice of infectious disease. Churchill Livingstone Inc. 5th ed. 2000: 1708-1714.

10-Turgut H, Sacar S, Toprak S, Asan A. Fertile women are still under risk for having congenital rubella syndrome infants in Denizli /Turkey. The Internal Journal of Infectious Diseases. 2004; Vol 3, Number 2.

11-Robertson SE, Featherstone DA, Gacic M, Hersh BS. Rubella and congenital rubella syndrome: global update. Rev Panam Salud Publica. 2003 Nov; 14 (5): 306-15.

12-Bullens D, Smets K, Vanhaesebrouk P. Congenital rubella syndrome after maternal reinfection. Clin Pediatr 2002; 39 (2): 113-6.

13-Banerji A, Jones E, Kelly E, Robinson JL. Congenital rubella syndrome despite maternal antibodies. CMAJ. 2005; 172 (13).

14-World Health Organization. Direct ELISA as a secondary test for assaying the potency of vaccines containing tetanus toxoid in: Manual of laboratory Methods for testing of vaccine used in the WHO expanded Programme of immunization. Geneva; WHO, 1997; Publication NO. WHO/ VSQ/ 97.04.

15-Abdul-Karim ET. Level of immunoglobulin in the community against poliovirus and factors that might affect it. A PhD thesis submitted to the Council of College of Medicine and the Committee of Graduate studies of Al-Nahrain University, Baghdad. Iraq 2000.

16-Chlamydia antibodies, IgG. Laboratory Corporation of America ® Holdings and Lexi-Comp Inc. 2003

17-Paul VK, Singh M, Gupta U, Buckshee K, Bhargava VL, Takkar D, Nag VL, Bhang MK, Deodar AK. Prevalence of chlamydia trachomatis infection in pregnant women. Nat-Med-J-India. 1999 Jan-Feb; 12 (1): 11-4.

18-Nyari T, Woodward M, Meszaros G, Karsai J, Kovace L. Chlamydia trachomatis infection and the risk of perinatal mortality in Hungary. J-P2001; 29 (1): 55-9.

19-Davies HD. Screening for Chlamydia infection. Canadian Task Force on periodic Health Examination. Canadian Guide to Clinical Preventative Health Care. Ottawa: Health Canada; 1994.p732-42

20-Tiller CM. Chlamydia trachomatis during pregnancy: implications and impact on perinatal and neonatal outcomes. J Obstet Gynecol Neonatal Nurs. 2002; 31: 93-8.

21-CDC. Recommendations for the Prevention and Management of chlamydia trachomatis infection, 1993. MMWR 1993; 42 (RR-12).

22-Popovich DM, McAlhany A. Practitioner care and screening guidelines for infants born to Chlamydia-positive mothers. NBIN. 2004. 4 (1): 51-55

23-Ortega JM, O 'Rourke KO, Badkar J. sexually transmitted infections in New Zealand. Wellington: Annual Surveillance Report 2002: ESR; May 2003. Available online. URL: http://www.sur.esr.cri.nz/PDF _surveillance/STISurvRpt/2002/STIAnnualReport2002.pdf Accessed May 2004.

*Assist Prof. Dept. Community medicine \ Medical College\ Al- Nahrain University

** Prof. Dept. Dept. Microbiology\ Medical College\ Al-Nahrain University

*** Assist lecture, Medical Research Center \ College of Medicine \ Al- Nahrain University