Association between Chlamydia Trachomatis Cervicitis and Preterm Labor

Thesis
Submitted for partial fulfillment of the Master Degree in
Obstetrics and Gynecology

By

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2017

Acknowledgement

*First of all, all gratitude is due to **Allah** almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.*

*Really I can hardly find the words to express my gratitude to **Prof. Sabry Sayed Mohamed,** Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his supervision, continuous help, encouragement throughout this work and tremendous effort he has done in the meticulous revision of the whole work. It is a great honor to work under his guidance and supervision.*

*I would like also to express my sincere appreciation and gratitude to **Prof. Noha Hamed Rabei,** Professor of Obstetrics and Gynecology, Faculty of Medicine - Ain Shams University, for her continuous directions and support throughout the whole work.*

*I would like to express my deepest gratitude to **Dr. Malames Mahmoud Faisal,** Lecturer of Obstetrics and Gynecology- Faculty of Medicine- Ain Shams University, for her great effort and kind advice support meticulous revision and valuable supervision throughout this work helping me to accomplish this work the best it could be.*

*I cannot forget the great help of **Dr. Ali Mohamed Zaki,** Professor of Microbiology, Faculty of Medicine, Ain Shams University, for his invaluable efforts , tireless guidance and for his patience and support to get this work into light.*

Amira Sayed Amin

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List of Abbreviations

BMI : Body mass index
CS : Cesarean section.
CT : Chlamydia trachomatis.
DBP : Diastolic blood pressure.
GA : Gestational age.
VD : Vaginal delivery.
PDA : Patent ductus arteriousus.
PROM : Premature rupture of membranes.
PTL : Preterm labor.
RDS : Respiratory distress syndrome.
SBP : Systolic blood pressure.
VSD : Ventricular septal defect.
MOMP : Major outer membrane protein.
LGV : Lymphogranuloma venerum.
NAATs : Nucleic Acid Amplification Tests.
FVU : First-void urine.
PCR : Polymerase chain reaction.
EP : Ectopic pregnancy.
RR : Risk ratio.
PTB : Preterm birth.
MMWR : Morbidity and mortality weekly report.

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Protocol

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Introduction

Preterm labor is defined as the onset of labor in women before 37 completed weeks of gestation. The incidence of preterm labor varies from 10-15% of all pregnancies ***(Kore et al., 2004).***

Currently, preterm labor is one of the most challenging problems confronting the obstetricians and the perinatologists, as prematurity accounts for 50-75% of the perinatal mortality ***(Dasgupta, 1998).***

There are various causes of preterm labor, though in a majority of cases, the cause is unknown. Infections, maternal medical and surgical disorders, uterine overdistension, uterine anomalies, placental anomalies and fetal pathologies are amongst the causes for preterm labor. There are some factors associated with preterm labor like socioeconomic, genetic, constitutional and obstetric factors ***(Patel et al., 2015),***

Chlamydial infection refers to infection caused by any species belonging to the bacterial family *chlamydiaceae*. *Chlamydia trachomatis* is only found in humans ***(Jawetz et al., 2004).***

They are obligate intracellular bacterial pathogens of prokaryotic cells and are differentiated from other bacteria by their morphology and a unique developmental cycle involving two morphological forms adapted for

extracellular survival multiplication within cytoplasmic vesicles and commonly termed inclusions ***(Duru et al., 2014).***

Chlamydia trachomatis is an important cause of sexually transmitted infections (STIs) in women, which may lead to pelvic inflammatory disease, tubal infertility, ectopic pregnancy, and chronic abdominal pain ***(Manavi, 2006).***

Chlamydial infection during pregnancy may in addition influence pregnancy outcomes leading to preterm labor, premature rupture of the membranes, low birth weight, neonatal death and postpartum endometritis ***(Mardh, 2002).***

The literature regarding the detrimental effects of *Chlamydia trachomatis infection* on pregnancy outcome, however, yields conflicting results that seem primarily due to differences in study design, population and microbiological tests employed ***(Blas et al., 2007).***

Various changes in pregnancy have been proposed to influence *Chlamydia trachomatis* infection. First, cervical ectopy (related to estrogen levels) has been associated with *Chlamydia Trachomatis* infection and with pregnancy, and is supposed to increase shedding of *Chlamydia trachomatis* and/or increase the risk of chlamydial infection. Second, pregnancy is physiologically immunosuppressive and alters

the immune responses progressively with advancing gestation to a nadir at 32 weeks gestation, which may affect replication and shedding of *Chlamydia trachomatis*. Third, maternal antichlamydial antibodies cross the placenta after 5-6 weeks gestation and are found in breast milk, which may be protective for neonates ***(Klein and Gibbs, 2005).***

It has been hypothesized that inflammation of decidual tissue or chorioamnion leads to prostaglandin production, cervical ripening, and subsequent uterine contractions. It is not known exactly when this inflammatory process begins, or how long a latency period is required for symptoms to manifest ***(Klein and Gibbs, 2005).***

The most challenging issue of the chlamydia trachomatis infections is the difficulty of diagnosis. In the past cell culture was regarded as the gold standard nevertheless this method requires an experienced team and some technical equipment. Nowadays there are new antigen determination methods such as direct fluorescent antibody (DFA) and enzyme immunoassay (EIA) which provide a rapid result. Among many molecular methods polymerase chain reaction (PCR) possesses a high sensitivity for chlamydia thus it will likely become the gold standard diagnostic modality in the future ***(Blake et al., 2005).***

Whether chlamydial infection increases preterm birth, premature rupture of membranes (PROM) and

prenatal mortality is a controversial issue ***(Baud et al., 2008).*** Some of the studies revealed a direct correlation between chlamydia trachomatis and preterm labor whereas other studies were unable to show a relation at all.

A case control study by ***Yalti et al. (2015)*** found no statistically significant correlation between chlamydia trachomatis and preterm labor. In a similar case control study by ***Silveria et al. (2009)*** chlamydia infection couldn't be linked to preterm labor. In another cross sectional study by ***Karowick et al. (2007)*** chlamydia trachomatis hadn't been detected at all.

On the other hand, a prospective case control study by ***Dubey et al. (2014)*** reported that 55.6% women with preterm labor were positive for chlamydia compared with 21.7% of normal control. In a similar prospective case control study by ***Odendaal and Schoeman (2006)*** reported that the prevalence of chlamydia trachomatis in preterm labor was 22.2% compared with 10.4% in term labor. In another population based cohort study by ***Blas et al. (2007)*** reported that chlamydia-infected women were at an increased risk of preterm labor (Relative Risk 1.46) compared with non-infected women. Another cross sectional study by ***Schmidt et al. (2015)*** reported that the prevalence of chlamydia tachomatis among preterm birth was 13.9%. In another case control study by ***El-Shourbagy et al. (1996)*** reported that prevalence of chlamydia trachomatis among patients with preterm labor was 56.3%.

Hypothesis:

In women with preterm labor, chlamydia trachomatis cervicitis may be more common than in women with term labor.

Question:

In women with preterm labor does chlamydia trachomatis cervicitis more common than in normal control at term?

Aim of the work:

This study aims to compare the prevalence of chlamydia trachomatis cervicitis in women with preterm labor and control at term.

Patients and Methods

This is a case-control study**.** It will be held in the causality of Ain Shams University Maternity Hospital.

The study group will include 35 pregnant women with singleton fetus with symptoms of preterm labor. The control group will include a similar number 35 of pregnant women with singleton term pregnancies.

The presence of cervicitis on the physical examination will be noted. The presence of cervical congestion, erythema, edema and fragility in addition to copious mucopurulent discharge from the endocervical canal defined as cervicitis.

Bacterial Vaginosis will be excluded from the study. Whiff test will be used by adding several drops of a potassium hydroxide solution to a sample of vaginal discharge. If a strong fishy odor is produced, bacterial vaginosis is present.

Swab will be taken from endocervix and chlamydia trachomatis DNA will be examined by real time polymerase chain reaction (PCR).

PCR will be held in the department of Medical microbiology and immunology, Faculty of Medicine Ain Shams University by Prof .Dr. Ali Mohamed Zaki.