Impact of Antichlamydial Treatment on the Rate of Preeclampsia among Egyptian Primigravidae: a Randomized Controlled Trial

Thesis

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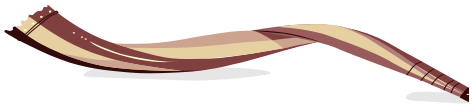

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List of Abbreviations

Abb.	Mean
ACE	Angiotensin converting enzyme
ACS	Acute coronary syndrome
ADP	Adenine di phosphate
ATP	Adenine tri phosphate
CABG	Coronary artery bypass graft
CAD	Coronary artery disease
CD	Cluster of differentiation
CF	Complement fixation
COPD	Chronic obstructive pulmonary disease
COX	Cyclo-oxygenase
CRP	C-reactive protein
DBP	Diastolic blood pressure
DNA	Deoxyribonucleic acid
EB	Elementary body
ELISA	Enzyme-linked immunosorbent assay
EM	Electron microscopy
FITC	Fluorescence thiocyanate
GA	Gestational age
GFP	Green fluorescent protein
GFR	Glomerular filtration rate
HLA	Human leukocytic antigen
hsp-60	High sensitive protein-60
ICC	Immunocytochemical
IgG	Immunoglobulin G

Abb.	Mean
IgM	Immunoglobulin M
IHC	Immunohistochemical
IUGR	Intrauterine growth retardation
IVF	In vitro fertilization
LCR	Ligase chain reaction
LGV	Lymph granuloma venerum
LPS	Lipopolysaccharide
MHC	Major histocompitability complex
MI	Myocardial infarction
MIF	Micro immune-fluorecent
MOMP	Major outer membrane protein
NK	Natural killer cell
NO	Nitric oxide
NOS	Nitric oxide synthase
PBMCs	Peripheral blood mononuclear cells
PCR	Polymerase chain reaction
PET	Preeclamptic toxemia
PG	Prostaglandin
PIGF	Placental growthfactor
POMP	Principle outer material protein
RB	Reticulate body
r-DNA	Ribosomal deoxyribonucleic acid
RNA	Ribonucleic acid
ROS	Reactive oxygen species
r-RNA	Ribosomal ribonucleic acid
SAP	Stable angina pectoris

Abb.	Mean
SBP	Systolic blood pressure
SDA	Strand displacement amplification
SOD	Superoxide dismutase
TCR	T cell receptor
TIA	Transient ischemic attack
TRIA	Time resolved fluoroscopic immunoassay
VEGF	Vascular endothelial growth factor
V-WF	Von willbrand factor

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Introduction

Hypertensive disorders of pregnancy, particularly preeclampsia, are one of the leading causes of fetal and maternal morbidity and mortality. Preeclampsia affects between 5% and 8% of all pregnant women ***(Sibai et al., 2003).*** The condition is associated with increased vascular resistance and enhanced pressor response. This lead to the hypothesis that preeclampsia might be caused by endothelial cell dysfunction, given that endothelial cells play a critical role in the regulation of blood vessel tone ***(Villar et al., 2004).***

The placental blood vessels in patients with preeclampsia show features of acute atherosis, and the pathogenesis of these lesions is similar to that of atherosclerosis, involving inflammation and endothelial cell damage ***(Von et al., 2003).*** Women who develop preeclampsia seem to have an inflammatory response that is more intense than that of healthy pregnant women, and it has been proposed that preeclampsia might be caused by a concurrent or preceding inflammatory stimulus such as an infection ***(Aral et al., 2006).***

Preeclampsia and coronary heart disease share many risk factors as diabetes, hypertension and obesity. One common feature is endothelial dysfunction, which may be a part of systemic inflammatory response ***(Heine et al., 2003)***.

In atherosclerosis injury-induced mononuclear cell accumulation, migration and proliferation of smooth muscle cells and formation of fibrous tissue ultimately lead to plaque formation and vessel obstruction ***(Lie et al., 1987)*.**

These pathologic features plus the finding that an elevation of inflammatory markers precedes atherosclerosis and coronary artery disease, have suggested an inflammatory origin to the altered endothelial dysfunction seen in atherosclerosis and coronary artery disease ***(Ridker et al., 2000)***.

Chlamydia is obligate intracellular bacterial pathogen of eukaryotic cells with a characteristic dimorphic growth cycle quite distinct from other bacteria. They are widely distributed in nature and are responsible for a variety of ocular, genitourinary and respiratory diseases in human. There is some evidence that Chlamydia pneumonia may play a role in atherosclerosis and coronary artery disease ***(Ward et al., 2003)***.

Since there is a strong link between Chlamydia pneumoniae infection and atherosclerosis, it is possible that such link also exist between Chlamydia pneumoniae infection and preeclampsia ***(Heine et al., 2003).***

Preeclampsia was reported in 20% of primigravidae who were seropositive to Chlamydia pneumoniae and in 2.8% of the seronegative primigravidae ***(Wahba et al., 2008).***

Recently, ***El shourbagy et al. (2011)*** showed that treatment of women who are seropositive to Chlamydia pneumoniae might help to reduce the rate of preeclampsia.

Aim of the Work

Research Hypothesis:

- **Research question:** Does the antichlamydial treatment affect the rate of preeclampsia among Egyptian primigravidae?
- **Research hypothesis:** Antichlamydial treatment has a vital role in decreasing the rate of preeclampsia among Egyptian primigravidae.
- **Objectives:** To compare the rates of preeclampsia among Egyptian primigravidae who will receive antichlamydial treatment and those who will not.
- **Medical application:** If it has been proved that usage of antichlamydial treatment decreases the rate of preeclampsia among primigravidae, this can be applied as a routine treatment in antenatal care to improve the maternal and neonatal outcomes.

Chapter (1):

Chlamydial Infection

Chlamydiae are obligate intracellular bacterial pathogens of eukaryotic cells with a characteristic dimorphic growth cycle quite distinct from other bacteria. Chlamydiae are small, non-motile bacteria that stain poorly with Gram's stain but they have the typical LPS (lipopolysaccarid) of Gram negative bacteria. They exhibit a dimorphic life cycle, in which infection is initiated by environmentally resistant, metabolically inert, infectious structures called elementary bodies, while larger, pleomorphic structures, and reticulate bodies are responsible for intracellular replication ***(Tan et al., 2010).*** There is some evidence that they may play a role in atherosclerosis and possibly, other diseases ***(Ward et al., 2003)***.

Chlamydiae were once considered viruses because they are small enough to pass through 0.45 um filters, are obligating intracellular organisms and lack peptidoglycan layer in their cell wall. However, the organisms have the following properties of bacteria:-

1) Possess inner and outer membranes similar to those of Gram- negative bacteria.
2) Contain both DNA and RNA.

3) Possess prokaryotic ribosomes.

4) Possess number of enzymes.

5) Synthesize their own proteins, nucleic acids, and lipids.

6) Are susceptible to numerous antibacterial antibiotics.

(Patrick et al., 2002)

❖ **Classification:**

Chlamydiae were classified within the kingdom: Prokaryotae, phylum: Gracilicuts, class: Scotobacteria, order: Chlamydiales, family: Chlamydiaceae, with one genus Chlamydia. The chlamydiae are among the most common pathogens throughout the animal kingdom ***(Corsaro et al., 2003).*** Among the genus chlamydia, there are 9 species: C. trachomatis, C. muridarum, C. suis, C. psittaci, C. pneumoniae, C. caviae, C. felis, C. abortus, and C. pecorum ***(Boman and Hammerschlag, 2002).*** The characteristics of the most common 4 species are listed in (table-1).