Prediction of Intra-amniotic Infection by Maternal Plasma Procalcitonin Level as a Marker in Cases of Preterm Premature Rupture of Membranes

Thesis

Submitted for Partial Fulfillment of Master Degree in Obstetrics and Gynecology

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Mohamed Nour El-Din

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List of Abbreviations

Abb.	Full term
ART	Assisted reproductive technique
COCP	Combined oral contraceptive pills
DVT	Deep vein thrombosis
ERs	Estrogen receptors
FSH	Follicle-stimulating hormone
GnRH	Gonadotropin-releasing hormone
IUD	Intrauterine device
LH	Luteinizing hormone
LNG	Levnonorgestrel
LNG -IUD	Levonogestrel releasing intrauterine device
LNG-IUS	Levonorgestrel intrauterine system
OTR	Oxytocin receptor
PCOS	Polycystic ovary syndrome
PE	Pulmonary embolism
PID	Pelvic inflammatory disease
PROM	Premature rupture of membrane
VPR	Vasopressin receptors

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INTRODUCTION

The management of a patient who presents with preterm premature rupture of membranes (pPROM) is controversial and remains a challenging task in perinatal medicine. Clinical management of pPROM before 34 weeks of gestation is generally expectant, with controversies surrounding the use of amniocentesis, corticosteroids, and tocolytics **(Keirse et al., 1996)**.

In women without signs of infection, the standard of care is hospitalization and bed rest until there is evidence of ascending infection or documentation of fetal lung maturity **(Stringer et al., 2004).**

Primary intra-amniotic subclinical infection is one of the main causes of pPROM and the early identification of such cases is necessary for choosing the proper mode of management **(McCaul et al., 1997).**

However, the number of methods of detecting subclinical infection is modest and limited. Several studies have demonstrated that fetal compromise can be suspected by measuring inflammatory mediators not only in amniotic fluid or in cervico-vaginal secretion, but also in the maternal blood **(Meisner et al., 2002).**

C-Reactive protein (CRP) and Total Leucocytic Count (TLC) were the most sensitive indicator of bacterial infection (sensitivity 84.8%), but it had a 37.9% false-positive rate **(Al-Nawas et al., 1999).**

Recently procalcitonin (PCT) was acknowledged as a specific marker of generalized bacterial infections **(Shalev et al., 1995).**

Procalcitonon (PCT) is a peptide precursor of the hormone calcitonin. It is composed of 116 amino acids and is produced by parafollicular cells (C cells) of the thyroid and by the neuroendocrine cells of the lung and the intestine **(Murtha et al., 1996).**

The level of procalcitonin in the blood stream of healthy individuals is below the limit of detection (0.05 µg/L) of biochemical assays **(Keirse et al., 1996).**

The level of procalcitonin rises in a response to a pro-inflammatory stimulus, especially of bacterial origin. It does not rise significantly with viral or non-infectious inflammations. With the derangements that a severe infection with an associated systemic response brings, the blood levels of procalcitonin may rise to 100 µg/L. In serum, procalcitonin has a half-life of 25 to 30 hours **(Monneret et al., 1999).**

The procalcitonin test is relatively new, but its utilization is increasing. Recent studies have shown that it has promise in diagnosis and prognosis of sepsis, bacteremia, pneumonia, meningitis and helping to evaluate the risk that a seriously ill person is developing a systemic bacterial infection **(Torb´e et al., 2004).**

It is hypothesized that the procalcitonin has a role to play in prediction of intra-amniotic subclinical infection **(Von Minckwitz et al., 2000).**

Maternal plasma PCT concentrations are of value in the diagnosis of pPROM cases suspected of subclinical intraamniotic infection (IAI) and in the prediction of the length of the pPROM-to-delivery interval **(Ban´kowska et al., 2003).**

Previous study showed that procalcitonin may have a role in predicting intra-amniotic infection in pregnant women with preterm premature rupture of membranes **(Torb´e et al., 2004).**

AIM OF THE WORK

Research hypothesis:

In women with pPROM, maternal serum procalcitonin may be elevated and could be used as a marker for prediction of intra-amniotic infection.

Research question:

In women with pPROM, Can maternal serum procalcitonin predict intra-amniotic infection accurately?

Aim of Study:

This study aims to assess the accuracy of maternal serum procalcitonin in prediction of intra-amniotic infection in women with pPROM.