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DETECTION OF RUBELLA VIRUS IN ABORTED WOMEN

BY IgG AVIDITY TEST

Dissertation submitted in partial fulfillment of M.Sc. degree in (Microbiology).

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أَعُوذُ بِاللَّهِ مِنَ الشَّيْطَانِ الرَّجِيمِ

سُورَةُ الْفَاتِحَةِ الْبَقَّةُ الْعَمْرَانِ النَّسَاءُ الْمَائِدَةُ الْأَنْعَامُ الْأَعْرَافُ الْأَنْفَالُ
التَّوْبَةُ يُونسُ هُودُ يُوسُفُ الرُّعْدُ إِبْرَاهِيمَ الْحَجَرِ الْمَيْمُونَةُ الْكَهْفُ
مَرْيَمُ طهُ الْأَنْبِيَاءُ الْحَجُّ الْمُؤْتَفُونَ النُّورُ الْفُرْقَانُ الشُّعْرَاءُ الْجَمَلُ
الْقَصَصُ الْعَنْكَبُوتُ الرُّومُ لُقْمَانَ السَّجْدَةُ الْأَحْزَابُ سُورَةُ قَطِيسِ
الصَّافَاتُ صُحُفُ الرِّمِّزِ عَمَّالُ فَصَلَاتُ الشُّورَى الرَّخْفُ الدُّجَانُ الْجَنَائِزُ
الْأَحْقَافُ مُحَمَّدُ الْبَيْتِجِ الْمَخْرَاتُ وَنِ الدَّارَاتِ الطُّورُ الْجَنَّةُ الْعَمَكِي
الرَّحْمِ الْوَأَقَعْتِجِ الْمَخْدِي الْمَخَالِجِ الْجَمَّةُ الْمُتَحْتِجِ الصَّفَا الْجَمْعِي الْمَنَافِي
النَّجَابُ الطَّلَاقُ التَّحْقِينِ الْمَلِكُ الْقَلْبِجِ الْمَقْلَةُ الْمَعْلَاجُ نَوْحُ الْمَخَانِ

سورة الحج: ٥

Dedication

I would like to dedicate this MSc thesis for:

My father

My mother

My brothers

My sisters

My friends and

everyone I love.

Acknowledgment

First and foremost, I would like to thank Allah, the most gracious and the most mercy full for his unlimited grace and buoyancy, particularly upon his support to do this work.

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ABSTRACT

Rubella virus is the pathogenic agent of the disease rubella. If it acquired during the first 16 weeks of gestation, can result in miscarriage and serious fetal defects. According to World Health Organization (WHO) report 110 000 congenital rubella syndrome (CRS) cases occur each year world-wide.

The study aimed to detect anti-rubella virus (RV) IgG in aborted women by immunoglobulin G (IgG) avidity and anti-rubella virus ELISA (IgG) in order to know frequency of anti-rubella virus (RV), to identify at which stage (trimester) it mostly cause abortion in women, to evaluate whether it also found in non-aborted women or not, and to correlate with certain risk factors which include gestational period, age, occupation and etc.

This is case control study which include collection of forty-six (Thirty-seven test sample from aborted women and nine control sample from non-aborted women) whose age ranges from 18 to 39. Test samples were collected from **Omdurman Maternity Hospital**, while control samples collected from **Omdurman Teaching Hospital** during 2016-2017. IgG avidity test was performed using (EUROIMMUN Avidity determination of IgG anti-bodies against RV kit). The test was performed according to manufactures instruction.

Among the aborted women, 19/27 (51.35%) were in the first trimester, 13/37 (35.135%) in the second, and 5/37 (13.51%) in the third trimesters. 34/37 (91.89%) of test samples showed high avidity anti-bodies, while the others 3/37 (8.11%) equivocal range, there is no low avidity (P. Value = 0.042).

In the same way in ELISA test 36/37 (97.3%) is positive, only 1/37 (2.7%) is border line. Among participating women 32/37 (86.48%) of them house keeper, 2/37 (5.4%) teacher, 1/37 (2.7%) student, 1/37 (2.7%) fire engineer, and 1/37 (2.7%) free worker (P. V= 0.014).

Regarding to their level of education 14/37 (37.83%) secondary, 12/37 (32.43%) primary, 5/37 (13.5%) graduate, 3/37 (8.1%) illiterate, and 2/37 (5.4%) under graduate (P.

V= .014). Odd ratio is zero. Occupation, education and age are the most related risk factors to the problem. The virus also detected in control sample, but their appearances are relatively lower than it is in serum of aborted women.

It can be concluded that, rubella virus can be found in aborted women and non-aborted one, it can cause abortion at high avidity, but it differs in causing abortion from women to women either based on virus's stage, host immunity difference, or other factors. Both IgG avidity index and anti-rubella virus ELISA (IgG) test shows almost the same result.

المستخلص

هدفت هذه الدراسة لتحديد فيروس الحصبة الألمانية في النساء المجهضات بواسطة الأجسام المضادة المناعي IgG أبيتدي، والمضادات لفيروس الحصبة الألمانية ELISA للتعرف على مدى انتشار الفيروس ، وبأي مرحلة من مراحل الحمل يكون الاجهاض أكثر حدوثا، وهل هو يظهر في المرأة غير المجهضات أيضا؟، ولمقارنة النتائج.

وتم جمع 46 عينة (37 من النساء المجهضات، و9 عينات من النساء غير المجهضات للضبط). وأعمارهن ما بين 18 إلى 39 سنة. وجمعت العينات من النساء المجهضات من مستشفى القابلات بأم درمان، وعينات الضبط من مستشفى أم درمان التعليمي في مدة 2016-2017. وأجري الفحص بناء على ارشادات الشركة المصنعة. وتم حساب النتائج بقسمة العينات المعالجة باليورينا على العينات غير المعالجة باليورينا والضرب في المائة. وبالنسبة بالفحص ب ELISA تم قسم كل العينات على تدرج 3 (Calibrator3).

من بين النساء المجهضات 19/37 (51.35%) يحدث الاجهاض في المرحلة الأولى من الحمل، 13/37 (35.135%) في المرحلة الثانية، و5/37 (13.51%) في المرحلة الثالثة. 34/37 (%) (91.89) من العينات المبحوثة لوحظ أن لديها أبيتدي عاليا ضد الأجسام المضادة بينما 3/37 (8.11%) غير قابل للتحديد (equivocal)، وليس هناك أبيتدي منخفض. وبنفس الطريق ELISA 36/37 (97.3%) موجب، و1/37 (2.7%) فقط خط الحدود (borderline). وبالنسبة للعمر 26/37 (70.27%) 18-28، 11/37 (29.72%) 29-39. وبالنسبة بالوظائف 32/37 (86.48%) مدبرة المنزل، 2/37 (5.40%) مدرسة، والباقي بوظائف أخرى.

وكذلك تم تحديد الفيروس أيضا في عينات الضبط، ولكن نسبتها قليلة مقارنة في المصل المجهضات. ونستطيع أن نستخلص أن فيروس روببلا يوجد في النساء المجهضات وغير المجهضات، ويتسبب الاجهاض في الدرجة العالية من أبيتدي. ولكن يختلف من مرأة إلى أخرى إما بناء على مرحلة الفيروس أو مناعة العائلة أو عوامل أخرى. كل من فحص IgG أبيتدي والمضاد فيروس روببلا ب ELISA أعطى نتائج متقاربة جدا.

Abbreviation

Ab	Anti-body
A	Adenine
AVIcomp	Avidity Competition
C	Cytosine
CDC	Centers for Disease Control and Prevention
CMV	Cytomegalovirus
CRS	Congenital Rubella Syndrome
dsRNA	Double Strand Ribo-Nucleic Acid
ELISA	Enzyme Linked Immunosorbent Assay
E	Envelope
G	Guanine
HIV	Human Immunodeficiency Virus
HPA	High Positive Avidity
IgG	Immune Globular Gama
IgM	Immune Globular Mu
LPA	Law Positive Avidity
MMR	Measles mumps and rubella
P ³²	Protein or polypeptide
RAI	Relative Avidity Index
RI	Replicative intermediates
RF	Replicative forms
RV	Rubella virus
WHO	World Health Organization

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