AMNIOTIC FLUID VOLUME IN RELATION TO RECURRENT MISCARRIAGE

Thesis
Submitted for Partial Fulfillment of Master Degree
In Obstetrics and Gynecology

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Ain Shams University
Cairo

2009

العلاقة بين حجم السائل الأمنيوسى والإجهاض المتكرر

رسالة مقدمه

توطئة للحصول على درجة الماجستير

فى أمراض النساء والتوليد

مقدمة من

الطبيبة /إيمان شعبان محمد على

بكالوريوس الطب والجراحة

(جامعة عين شمس 2002)

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القاهرة

2009

Acknowledgement

Before all, I would like to express my deep thanks to **Allah**.

I wish to express my sincere and deep appreciations to my most distinguished ***Prof. Dr. Essam-Eldin Mohamed Ammar;*** Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for providing me the opportunity of working under his supervision of which I feel most proud. His constant encouragement, constructive guidance and paternal support were the major factors behind the completion of this work.

I am indebted to ***Prof. Dr. Abdel-Megeed Ismail Abdel-Megeed*** Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his remarkable effort, valuable advice that have been of utmost help. His constant support, continuous guidance and meticulous revision were the paramount axes in the selection, initiation and progress of this work.

Finally, I wish to thank all who helped me to complete this work.

AMNIOTIC FLUID VOLUME IN RELATION TO RECURRENT MISCARRIAGE

By: Eman Sha'ban Mohammed Ali

Purpose: To study if there is any association between amniotic fluid volume and risk of recurrent miscarriage.

Subjects and methods: This study comprised two groups group (A) control group which comprises 20 pregnant women of healthy singleton pregnancy in the first trimester, without previous history of abortions and group (B) study group which Comprises 40 pregnant women with history of recurrent pregnancy loss.

We had done 2 D transvaginal ultrasound for each subject to take our measures crown rump length, gestational sac volume and embryo volume; from the last two measures, we calculated amniotic fluid volume (these measurements were be taken twice for each subject, first at 6-8 weeks gestational age and second at 10-12 weeks gestational age) then subjects were be followed up at Out Patient Clinic or contacted by telephone until they reach 20 weeks gestational age**.**

Results: There was statistically significant positive correlation between gestational age and amniotic fluid volume in control group (p=.000 at first & .002 at second US scan) and non statistically significant correlation (p= .406 at first & .297 at second US scan) between them at study group in both first and second ultrasound scan.

The amniotic fluid volume in subjects who had aborted before 20 weeks gestation (subgroup II) was statistically significant lower than that in subjects who did not abort before 20 weeks gestation (subgroup I) at both first(p =.059) and second(p= .031) ultrasound scan.

By doing the ROC curve on group B(study group) the best cut-off point to predict abortion was 2.43 cm3 at first ultrasound scan (6-8weeks gestation) with a sensitivity of 77.8% and a specificity 22.6%.and the best cut off value was 8.61cm3 at second ultrasound scan (10-12 weeks) with a sensitivity of 66.7% and specificity 32.3%.however these cut off values was unreliable in predicting the occurrence of abortion before 20 weeks gestation as the area under the curve was around 33%.

Conclusion: Amniotic fluid volume measured by 2D transvaginal ultrasound is not a good tool in prediction of occurrence of abortion in subjects with history of recurrent pregnancy loss; however, further studies are needed to verify our results.

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List of abbreviations

AFI	Amniotic Fluid Index.
AFP	Alpha-fetoprotein.
AFV	Amniotic fluid volume.
APS	Antiphospholipid syndrome.
APTT	Activated partial thrombin time.
ASV	Amniotic sac volume.
Cm	Centimeter.
CRL	Crown rump length.
DES	Diethylstilbestrol.
EV	Embryo volume.
F.H.M	Fetal heart motion.
FISH	Fluorescent in situ hybridization.
FSH	Follicular stimulating hormone.
GA	Gestational age.
GSV	Gestational sac volume.
HbA1c	Glycosylated hemoglobin A1C.
hCG	Human chorionic gonadotrophine.
HLA-DR	Histocompatibility antigen class DR.
HLA-G	Histocompatibility antigen class G.
HS	Highly significant.
IgG	Immunoglobulin G.
IgM	Immunoglobulin M.
IVF	In-vitro fertilization.
IVIG	Intravenous immunoglobulin.
IVP	Intravenous pyelography.
LH	Luteinizing hormone.
LMWH	Low molecular weight heparin.
MECRL	Measured /expected crown rump length.
MGS	Mean gestational sac.
MHz	Megahertz.
ml	Milliliter.

mm	Millimeter.
N (n)	Number.
NS	Non significant.
PCOs	Polycystic ovarian syndrome.
ROC curve	Receiver Operator Characteristic curve.
RPL	Recurrent pregnancy loss.
RVVT	Russet's viper venom time.
S	Significant.
SD	Standard deviation.
SDP	Single deepest pocket.
Sig.	Significance.
TH_I	T-helper cell type 1.
TIUV	Total intrauterine volume.
TUV	Total uterine volume.
U/S	Ultrasound.
WHO	World Health Organization.

Introduction

INTRODUCTION

Amniotic fluid is extremely important for adequate fetal growth and development. Its origin and production vary according to gestational age and depends on exchanges involving fetus, placenta, membranes and mother. Changes in its volume throughout pregnancy require evaluation of mother fetus pair ***(Voxman et al., 2002)***.

Amniotic, chorionic fluid are an ultra filtrate of maternal plasma prior to 12 week and accounts for a large component of gestational sac volume (GSV); that it should reflect uteroplacental function and that normal GSV should indicate normal early pregnancy ***(Steiner et al.,1994)***. The mechanism of production and maintenance of amniotic fluid, its volume and component depends on gestational age ***(Brace, 1995)*** with the volume being of 25 ml in 10 weeks, 250 ml in 16 week and increase progressively thereafter ***(Weissman et al., 1996)***.

Measurements of volume of amniotic sac, vitellin vesicle and embryo provide important information about embryo viability and predict abnormalities that may lead to fetal losses ***(Babinszki et al., 2001)***.

The ability to have accurate volume measurements may permit better diagnostic and prognostic possibilities in early pregnancy ***(Acharya and Morgan, 2002).***

It has been estimated that 50 -70% of all conceptions fall and 15 -20% of all clinically documented pregnancies result on spontaneous abortion ***(Diane, 2002)***. Recurrent

pregnancy loss is 2 or more consecutive spontaneous abortion before 20 week ***(Sperrof, 2005),*** it affects 0.5-1.0%of pregnant women which is either primary (women without a previous live born infant) or secondary (women with at least one prior live born infant) ***(Diane, 2002)***.

Repeated spontaneous abortion are likely to be chance phenomena in majority of cases, accepting an independent risk of miscarriage occurrence to be 15 %, a second loss could be calculated to occur at rate of 2.3% and a third loss in 0.34 of women So, 1-2% will have 3 or more losses and 5% will have 2 or more losses ***(Blumenfeld and Brenner, 1999)***.

Allover for most women who experience miscarriage the recurrence rate is below 30% and the chance of live birth after 3 consecutive losses is 55 - 60% ***(Blumenfeld and Brenner, 1999)***.

As Amniotic fluid is the mirror of any placental or membranous abnormalities so, its volume reflects stability of the pregnancy and risk of diseases at these organs and so on; amniotic fluid volumetry has very important clinical value in predicting healthy of pregnancy and avoiding exposure to recurrent pregnancy loss.