بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

Predictive Value of Complete Blood Count Parameters in Placenta Accreta

Thesis

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

By

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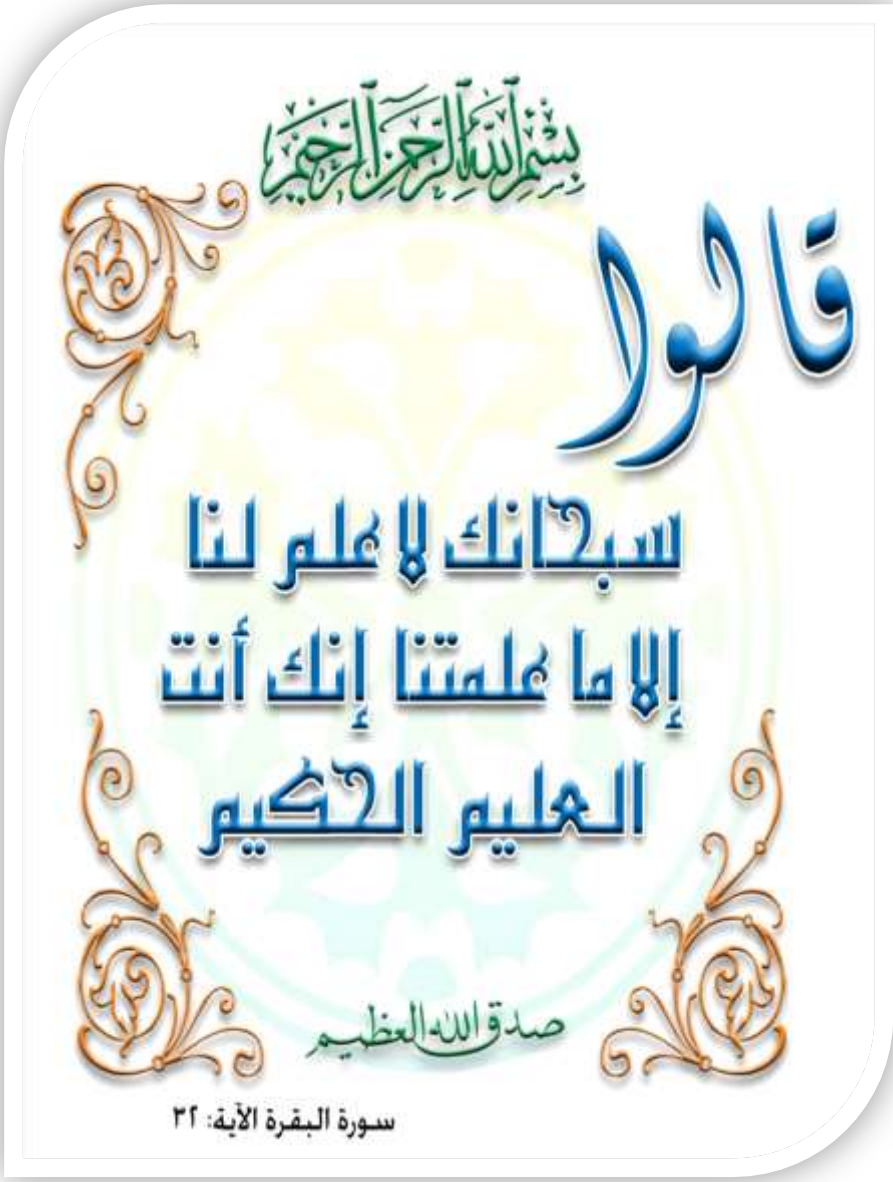
2020


بسم الله الرحمن الرحيم
قالوا
سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم
صدق الله العظيم
سورة البقرة الآية: ٣٢

First and foremost, I feel always indebted to Allah, the Most Beneficent and Merciful. I can do nothing without Him.

I would like to express my sincere gratitude to ***Dr. Abd El Megeed Ismail Abd El Megeed,*** *Professor of Obstetrics & Gynecology, Faculty of Medicine - Ain Shams University, under his supervision, I had the honor to complete this work, I am deeply grateful to him for his professional advice and support.*

My deep gratitude goes to ***Dr. Ahmed Sherif Abd El Hamid,*** *Assistant Professor of Obstetrics & Gynecology, Faculty of Medicine - Ain Shams University, for his great efforts and meticulous supervision throughout this work.*

I would like also to thank with all appreciation ***Dr. Ahmed Mahmoud Hussein,*** *Assistant Professor of Obstetrics & Gynecology, Faculty of Medicine - Ain Shams University, for the efforts and time he has devoted to accomplish this work.*

Last but not least, I can't forget to thank all my ***Family****, especially my beloved* ***Parents and Husband*** *for their kind care, help and encouragement.*

Rawhia Elsayed Mohammed Elsayed

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List of Abbreviations

Abbr.	Full-term
B-HCG	**:** Beta Human Chorionic Gonadotrophin
MOM	**:** Multiples of the median
MPV	**:** Mean platelet volume
MPV	**:** Mean platelet volume
MSAFP	**:** Maternal serum alpha-fetoprotein
N/L	**:** Neutrophil/ lymphocyte
NLR	**:** Neutrophil/lymphocyte rateocclusion of the aorta
PAPP-A	**:** Pregnancy associated plasmaprotein A
PAS	**:** Placenta accreta spectrum
PI3K/AKT	**:** Phosphatidylinositol 3′-kinase
P-LCR	**:** Large platelet cell ratio
PLR	**:** Platelet/ lymphocyte rate
PRBC	**:** Packed red blood cells
RDW	**:** Red blood cell distribution width
REBOA	**:** Resuscitative endovascular balloon
ROTEM	**:** Rotational thromboelastometry
TEG	**:** Thromboelastography
US	**:** United States

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Introduction

Implantation requires decidualization and vascular remodeling to provide essential nutrients and substrates to embryo. Some pregnancy complications such as early pregnancy loss, ischemic placental diseases, preeclampsia, intrauterine fetal growth restriction and premature delivery result from disturbed vascular growth in the placenta **(Zygmunt et al., 2013).**

Invasive nature of trophoblasts requires a strict control for healthy placentation (**Ahmed et al., 2010).**

Highly invasive nature of trophoblastic tissue may result in abnormal attachments to the uterine wall and therefore trophoblasts may invade into the myometrium (**Chantraine and Roos, 2013).**

The development of PAS is a complex multifactorial process. Normal placenta do not proceed beyond the inner third of the myometrium through tight spatial and temporal regulation; however, an invasive placenta proliferates and invades local structures in a similar fashion to a malignant tumour. The underlying molecular mechanisms of invasive placentation are poorly understood; proposed hypotheses include a combination of primary absence of the decidua or basal plate, abnormal maternal vascular remodelling, and excessive extravillous trophoblastic invasion **(Tantbirojn et al., 2008).**

Improved understanding of the molecular basis of other placental disorders such as preeclampsia suggests the inflammation and placental invasion may be closely related. A number of comparisons can be drawn between the microenvironment of PAS and tumour behaviour. Both conditions require an ability of cells to overcome the local immunological systems, activate invasion, and induce angiogenesis. In 2012, Hanahan and Weinberg outlined eight hallmark capabilities of tumours which allow them to invade and metastasise. Herein, we use these eight hallmarks of cancer to highlight some of the molecular similarities between PAS and tumour development (**Hanahan and Weinberg, 2011).**

- Inducing Angiogenesis (**Shainker et al., 2017).**
- Sustained Proliferative Signalling (**Stanek and Drummond, 2007).**
- Resisting Cell Death (**Gu et al., 2016).**
- Evading Immune Destruction (**Ernst et al., 2017).**
- Activating Invasion (**Chen et al., 2018).**
- Enabling Replicative Immortality/Evasion of Growth Suppression (**Geffen et al., 2017).**
- Reprogramming of Energy Metabolism (**Kilcoyne et al., 2017).**

In women with a history of prior Cesarean delivery (CD), scar defects are found to range between 20-65% of the myometrium after delivery on transvaginal ultrasound. Women with a residual myometrial thickness of <50% of the adjacent

myometrium are more likely to develop chronic complications such as intermenstrual spotting **(Voet et al., 2014).**

The myometrial fibers around a scar often show hyalinization or degenerative changes, with a local increase in fibrous tissue and infiltration by inflammatory cells. The comparison of ultrasound features of uterine cesarean scar with histological findings has shown that large and deep myometrial defects are often associated with absence of reepithelialization of the scar area **(Nagi et al., 2009).**

Leukocytes recruitment to the endometrium during the secretory phase may also be affected by the presence of a CD scar. A recent study of the uterine circulation in women with a previous CD has shown that the uterine vascular resistance is increased, while the volume blood flow is decreased, compared to women with a previous vaginal birth (**Flo et al., 2014).**

These data suggest that the blood circulation around the scar is impaired. Poor vascularization of the scar area may lead or contribute to permanent focal myometrial degeneration, as well as reduced or absent reepithelialization of the scar area.

Numerous studies proposed that cancer cell invasion has several common features with the trophoblast invasion **(Knöfler and Pollheimer, 2013).**

The neutrophil-to-lymphocyte and platelet-to-lymphocyte ratios are recent popular markers for inflammatory response and have been successfully applied as predictive markers and prognostic factors in various gynecological cancers **(Feng et al., 2016).**