

Study Of Some Physiological And Hormonal Factors And Their Relationship To Abortion

¹Raid Mohammed Raheem , *¹Nisreen Habib Humaidan and ²Hassan Resan Mubarak

¹Department of Biology, College of Education for Pure Sciences, University of Wasit, Iraq

²Department of Biology, College of Education for Pure Sciences, University of Thi-Qar, Iraq

Abstract

This study aimed to understand the hormonal and physiological factors and their relationship with abortion. We collected 100 samples of blood from 100 women who had undergone repeated abortion and women who didn't as a control group aged between 20-40. Red blood cells (RBC) count, PLT, platelet count, total white blood cells (WBC) count, and Haemoglobin were tested. Also, some hormones like progesterone and estrogen were tested. As a result of the hematological assay, Hemoglobin levels, platelet count, and erythrocyte count were low. While on the other hand, the number of WBC was significantly high. And the hormonal result was not much different getting progesterone level was significantly low, while, on the other hand, we got estrogen and it was significantly high. Abnormal levels of Haematological results and hormonal tests results may affect pregnancy in different ways and cause in the end, abortion.

Keywords: Abortion, Hormones, haematological assay, Physiological effect, low levels, high levels, pregnancy

Introduction

Abortion is one of the most complicated problems that threaten the lives of approximately 15% of pregnant women around the world. Abortion often occurs before the woman realizes that she is pregnant, and the problem becomes worse and more complicated when the abortion is repeated more than once and in a successive (1). There are many reasons for miscarriage (2). They are many, varied, and more than one cause may be involved at the same time, but 50% of these cases are still not scientifically explained (3). The term Spontaneous abortion (SA) or Miscarriage is defined as the loss of pregnancy before 24 weeks of pregnancy (4). Spontaneous abortion (SA) is the loss of pregnancy without external intervention before 24 weeks of pregnancy. And the term miscarriage is a term synonymous with it often used with the patients because the word abortion is usually associated with elective termination of pregnancy (5). And the term spontaneous pregnancy is usually used in place of abortion taking into account the emotional aspect (6). And there is another term that is used and is more emotionally neutral, which is early pregnancy failure (7). Abortion (8), Abortion is classified according to the period of pregnancy into early miscarriage 5-12 weeks and late miscarriage 13-39 weeks (6). And recurrent spontaneous abortions have many causes, including the well-known chromosomal abnormalities what are known as the genetic and immune causes, which are the most common, congenital malformations of prematurity, hormonal disorders, and

environmental factors as well as viral and parasitic infections (9) the congenital uterine malformation can cause abortion recurring (10). And hormonal disorder is an important reason, as an imbalance in the proportion of hormones secretion causes physiological disturbance that leads to pregnancy failure (11). In addition to the above reasons, other factors cause miscarriage, and the percentage of these influencing factors reaches 3%, include;

- * Environment.
- * Drugs
- * Reasons related o meals
- * Smoking
- * Alcohol and Caffeine (12), which contribute to hormonal disorders in 10-20% of miscarriages, which usually lead to miscarriages in the 10th week of pregnancy. Some studies have indicated that the occurrence of previous miscarriages doesn't necessarily increase the risk of losing another pregnancy. However, the total risk of another abortion isn't underestimated. The total risk of miscarriage on pregnancy is approximately 20% after one abortion, 28% after two consecutive abortions, and 43% after three or more abortions (13). In Iraq, abortion is considered as one of the problems with a dramatic increase in the recent decades, as cases of recurrent miscarriage among pregnant women have been recorded, and it has reached approximately 3-5% of registered pregnancies (14). It's worth noting that the bodies of living organisms contain an enzymatic and non-enzymatic antioxidant system that helps remove oxidizing molecules. Enzymatic systems such as Glutathione enzymes and Catalase Enzymes contribute to the removal of low molecular weight oxidants. Cellular membranes also contribute to protecting the body from free radical attacks (15). As any deficiency in certain inhibitors leads to the accumulation of active oxygen species, and this leads to mutations in DNA and damage to other biomolecules, such as oxidation of proteins and inactivation or activation of enzymes. This study aims to the physiological and hormonal causes such as progesterone and estrogen and their relationship to recurrent miscarriages.

Materials and methods

Sample collection

100 blood samples of 5 ml were collected from women who had undergone repeated abortion and women who didn't undergo it as a control group aged between 20-40 years from women who attended Al-Kut Hospital for Women and Children and Al-Zahra Teaching Hospital in Wasit Government – Iraq for the period from October 2020 to December 2020. 2.5 ml of the blood sample were kept in tubes containing an anticoagulant substance EDTA and then placed in freezing at -20 °C until DNA extraction for Genetic study, and the other 2.5 ml of blood sample were placed in other tubes containing anti-coagulant substance EDTA to conduct a coagulation study (16) & (17).

Hematological assay

Measuring the level of the RBCs

A blood test includes the following tests; Red blood cells (RBC) count, PLT, platelet count, total white blood cells (WBC) count, and Hemoglobin. And the test was done using a WBSs differential count, EDTA ml of blood after adding CELL-DYN Ruby hematology analyzer complete count, as the device

starts, the tube is placed at its specific place, after that the tube will be scanned, and the result will be readen automatically. When it appears we give the induction of American origin (16).

Progesterone

The concentration of the hormone was measured by following the ready-made steps referred to in the attached block with the analysis kit for the ACROMA device, which is manufactured by the company (bioner) itself, where (30) microns are taken from the serum of the sample and we put it with the buffer and mix well, then we take (75) microns of the solution The mixture is placed on top of the test and incubated for (15) minutes at a temperature of 137, and then the results are shown and written down (16).

Estrogen

The hormone is measured by following the ready-made steps. Referred to in the mass-produced by JANICKER and manufactured by the company (Changzhou) over a test and incubated for (15) minutes at 37°C, and then the results are shown and recorded (16).

Statistical Analysis

The data were statistically analysed using the SPSS program for statistical analysis, where the analysis of variance (ANOVA) was used to find out the least significant difference (LSD) Least significant difference, and it was the least significant difference for the studied tests under the probability level ($P \leq 0.05$).

Results and Discussions

Table 1: the relation between haematological essay and different age group.

Age (year)	Case	Hb gm/dl	PLT $10^3 /m^3$	RBC $10^3/m^3$	WBC $10^3 /m^3$
19-25 Group A	Patients	8.85 ±0.79	194.98 ±54.52	3.52 ± 0.44	8.36 ± 2.16
	Control	12.22± 0.58	264.8± 56.13	4.9 ± 0.93	8.15 ±1.95
26-32 Group B	Patients	9.00 ±1.10	194.94 ±49.95	3.52 ± 0.56	7.62 ± 1.36
	Control	12.53±1.06	230.07± 58.23	4.71± 0.27	6.64 ± 1.44
33-39 Group C	Patients	8.71 ±1.07	199.98 ±48.81	3.49 ±0.52	7.23 ± 2.40
	Control	12.31±1.18	259.09±74.65	4.96 ±0.31	7.19 ±1.644
L.S.D		0.51	27.31	0.41	2.06

At Table1 the results for blood test shows that levels of Hb, PLT, and RBCs have low levels in most patient, although they have a different age group. group C ages has the lowest level of hemoglobin, WBCs, and RBC. Group B shows the lowest level of PLT. However, from these results, we can infer that the Below-normal levels in the results of hematological essays seem to affect the different age categories as seen above in Table1 showing that abortion often occurs in those groups of a patient having a bad hematological assay. Although, normally hemoglobin concentration is affected in

pregnant women (18). And in these samples, there is a significant decrease which leads us to conclude that abortion may lead to a significant decrease in Hb concentrate. And in those women who have a good concentrate of Hb have a lower risk of losing the pregnancy (19). And the platelet indicates also can be used to expect fetal loss (20).

Table 2: The relation between ages of the patients, WBCs count and abortion

Age (year)	Case	NUT %	LYM %	MONO %	EOSE %	BASO %
19-25 Group A	Patients	55.42 ±6.72	16.35±3.63	4.639± 1.466	1.58 ±0.68	754 ± 0.36
	Control	68.52±7.10	22.56±2.97	7.292±1.822	0.68± 0.35	0.93 ± 0.50
26-32 Group B	Patients	48.69 ±9.82	20.61± 5.40	4.633±1.380	2.09 ± 0.75	0.80 ± 0.40
	Control	61.21± 6.96	28.6±4.782	6.35± 1.441	2.45± 0.49	1.13 ± 0.47
33-39 Group C	Patients	63.7±10.01	19.80±2.52	5.031± 1.568	1.43 ± 0.59	0.79 ± 0.45
	Control	56.25±9.83	34.5±6.33	6.38±1.548	1.96±0.55	1.05 ± 0.48
L.S.D		7.52	7.15	1.49	1.147	0.24

Looking back to Table 2 of WBCs count. We can find out that there is a decrease in the number of neutrophils of Mostly at all groups except at group C, there is a clear increase. Moreover, there is a decrease in the number of lymphocyte counts seen in group C. There is also a reduction in the count of Monocytes which is found in group A. At the Eosinophil count, there is a decrease seen at group B&C, but an increase was seen at group A. Furthermore, there is a decrease at the level of the Basophile in group B&C, but they are still at the normal range. There is an increase in the Basophile at age group A. That shows that abortion is affected by the WBCs count in the different ages as we can see that the neutrophile count mostly decreases when abortion occurs, especially at young ages, while the LYM. The count is decreased for the patient who got an abortion. Monocytes are decreased in all age groups. And These inflammation marker tests are used for the risk assessment of spontaneous abortion in pregnancy (21).

Table 3: Relation between hormones and abortion

Age (year)	Case	Progesterone (ng/ml)	Estrogen (ng/ml)
19-25 A	Patients	12.99 ±3.17	214.31±102.2
	Control	23.79 ±1.90	72.30 ±6.402
26-32 B	Patients	12.09 ±3.89	277.70 ±16.77
	Control	5.14 ±1.840	49.65 ±6.03
33-39	Patients	14.90 ±5.76	472.45 ±98.76

C	Control	18.90 ±5.53	42.38 ±5.93
L.S.D		12.24	17.19

Progesterone levels are decreased in patent group A & C, while It's elevated at group B, while the estrogen is elevated at all the groups, which occur very clear at groupage C. Progesterone and estrogen have been known to reduce pregnancy loss with threatening abortion, but as you can see above in Table3 the progesterone level is decreased, so it may be the cause of spontaneous abortion in the groups with reduced progesterone (22). And this deviation of progesterone reflecting the failure of ovarian response to human chorionic gonadotrophin (hCG) levels (23).

Conclusion

We conclude that abnormal levels of Haematological results and hormonal tests results may affect pregnancy in different ways and cause at the end abortion. So The difference in the incidence rate of spontaneous abortion was statistically significant among the different related factors in different ages. More studies are needed to confirm the causal relationship.

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