جامعة القادسية كلية العلوم قسم الكيمياء 2

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The effect of iron and vitamins supplementation during the last months of pregnancy on both fetus and pregnant health

بحث مقدم الى مجلس كلية العلوم/ قسم الكيمياء كجزء من متطلبات نيل شهادة البكالوريوس في علوم الكيمياء

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\$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ الشكر والتقدير: الحبد تندرب العالمين والصلاة والسلام على اشرف الانبياء والمرسلين وعلى اله وصحبه أجمعين. يسرنى وأنا ألجز هذا الجهد المتواضع ان اقدم جزيل شكري وامتنائى لاستاذاتى و.زينب بخه ود.اوراس عدنان ود.نوال حنطيل لما بذلنه من جهد في الخاز هذا البعث من خلال المتابعة والملاحظات القيسة طوال فترة الاشراف على كما أتقدم بوافر الشكر والامتنان والرحمة الى استاذي الفاضل د.عباس جواد. والشكر والتقدير لنرئيس قسم علوم الكيبياء وكافة الاساتدة لما قدموه من دغم ورعاية. واخيرا بل اولا ودائما شكري وامتنانى الى والدتى لتشبه يعها ودعسها، واعتنز ازي وشكري لكل من ساهم وساعد في الجاز هذا العل سواء بالجبهد والنصيحة.

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1-1 Pregnancy:

Pregnancy also known as gestation, is the time during witch one or more of sperm develops inside a women. A multiple pregnancy involve more than one of sperm such as with twins.

Child birth tipically occurs around 40 weeks from the last menstrual period. This is over nine month when each month averages 29 days. Symptom of early pregnancy many include missed period, tender breasts, nausea and vomiting, hunger and frequent urination. Pregnancy is typically divided into semester. ___The first semester is from weak one through 12 and include conception. Conception is when the sperm fertilized the egg. The fertilized egg then travels dawn the fallopian tube and attaches to the inside of uterus.

___The second semesters is from week 13 into around the middle of the second trimester movement of the fetus maybe felt.

___The third tymister is from 29 weeks through 40 weeks.

••Common symptoms and discomfort of pregnancy ••

•Tiredness

•Back pain

•Braxton Hicks Contraction: occasional, irregular and often painless contraction that occur several per day.

Constipation

[•]Pelvic girdle pain

Edema caused by the uterus led to compression of inferior vena cava and pelvic veins by the uterus lead to increased hydrostatic pressure in lower extremities.
-increased urinary frequency: caused by increased intra vascular volume, elevated glomerular filtration rate, and compression of the bladder by expanding uterus.

- Urinary tract infection

- Varicose veins: caused by relaxation of the venous. Smooth muscle and increased intravascular pressure.

- Hemorrhoids.

-Regurgitation, heart burn and nausea.

- Stretch marks.

-Breast tendrness.Its common during the first trimester and is more common in women who are pregnant it a young age.

••Start of gestational age••

The main method to calculated gestational age are:.

-Directly calculating the days since the beginnings of the last menstrual period.

-Early obstetric ultrasound, comparing the size of embryo or fetus to that of reference group of pregnancies of known gestational age (such as calculated from last menstrual period) and using the mean gestational age of other embryos or fetuses of the same size.

If the gestational age as calculated from un early ultrasound is contradictory to the one calculated directly from the last menstrual period, it's still the one from the early ultrasound that is used for the rest of the pregnancy.

-In case of in vitro fertilization, calculating day's since oocyte retrieval or incubation and adding 14 days.

The beginning of pregnancy maybe detected either based on symptoms by the women herself, or by using pregnancy tests.

Most pregnant women experience number of symptoms, which can signify pregnancy. A number of early medical sings are associated with pregnancy.

1-2 Diagnosis:

The beginning of pregnancy maybe detected either based on symptoms by the women herself, or by using pregnancy tests.

Most pregnant women experience a number of symptoms, which can signify pregnancy. A number of early medical sings are associated with pregnancy.

1-3 These sings include:

*The presence of human chorionic gonadotropin (hGG) in the blood and urine. *Missed menstrual period.

*implantation bleeding that occurs at implantation of the embryo in the uterus during in the third or fourth week after last menstrual period.

*increased basal body temperature sustained for over 2 weeks after ovulation. *pigmentation of the linear nigra,(darking of the skin in the midline of the abdomen, caused by hyper-pigmentation resulting from hormonal changes, usually appearing around the middle of pregnancy).

1-4 Bio markers:.

Pregnancy detection can be accomplished using one or more various pregnancy test, which detect hormones generated by the newly formed placenta.

Blood and urine test can detected pregnancy 12 days after fewer false negative. Home pregnancy test are urine test and normally detect a pregnancy 12 to 15 days after fertilization.

A quantitative blood test can determine approximately the date embryo was conceived because HGG(Human chronic gonadotropin)double 36 to 48 hours.

1-5 Parental care:

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Parental care may include extra folic aside, avoiding drugs and alcohol exercise blood tests, and regular physical examination.

Complication of pregnancy may include disorder of high blood pressure, gestational diabetes, iron-deficiency anemia, and serve nausea and vomting among other.

terms 39 and 40 weeks, and late terms 4 weeks. After 41 weeks it is known as post Babies born after 37 weeks are preterm and are higher risk of health problem Delivery 39 week's labor induction or caesarean section is not recommended About 213 million pregnancies occurred in 2012,190 million were in the developing world and 23 million were in developed world. The number of pregnancies in women ages 15 to 44 is 133 per 1000 women. _About 10% to 15% of recognized pregnancies end in miscarriage. In 2013, complications of pregnancy in 239,000 deaths, dawn from 377,000 _Common cause include maternal bleeding, complication of abortion, high blood pressure of pregnancy, maternal sepsis, and obstructed labor.

1-6 Nutrition:

death in 1990.

terms.

such as serbral pasly.

unless required for other medical reasons.

Nutrition during pregnancy is important to en sure healthy growth of the fetus. Its different from the non-pregnant state. There are increased energy requirements and specific micronutrient requirements.

_Term pregnancy is 37 to 41 weeks with early term being 37 to 38 weeks, full

Some women may need professional medical device if their diet is effected by medical condition, food allergies, or specific religious/ethical beliefs.

1-7 Vitamin supplementation

Vitamin are organic compounds which are essential for normal cell function, growth and development. There are 13 essential vitamins: A.C.D.E.K and the B series including B1(thiamine), B2(riboflavin), B3 niacin), B5(pantothenic acid), B6(pyridoxine), B7(biotin), B9(folic acid), B12 (carbalamin), sufficient levels of which are vital during pregnancy.

In the pregnant state there is an increased demand for vitamins, such as folic acid, yet intake among women of reproductive age in the UK is reported to be low.

Folic acid:(C₆H₁₉N₁₉O₇)

also called(folate or vit B9) in take has been shown to decrease the risk of fetal neural tube defects, such as spina bifida.

The natural tube develops during the first 28 days of pregnancy, a urine pregnancy test is not usually positive until 14 days post-conception, explaining.

The necessity to guarantee adequate folate intake before conception. Folate is abundant in green leafy vegetables, legumes, and citrus.

Docosahexaenoic Acid_DHA omega-3-(C₆₀H₉₂O₆)

Is a major structural fatty acid in the brain and retina and is naturally found in breast milk.

Its important for the women to consume adequate amount of DHA during pregnancy and while nursing to support her well-being and the health of her infant. _vit D and calisum required for bone development may also require supplementation.

_zinc supplementation: has been associated with adecease in preterm birth, is unclear whether it is causative.

'1-8'Daily Iron and Folic acid supplementation in pregnant women"

Anemia in pregnancy is a major health problem in many developing countries where nutritional deficiency, malaria and other parasitic infections contribute to increased morbidity.

As pregnancy proceeds, most women show hematological change suggesting iron deficiency, the hemoglobin and serum iron concentration fall and the total iron binding capacity rises, the mean hemoglobin concentration may remain constant or may fall.

In developed countries, the decrease in blood values in rarely of a magnitude sufficient to pose a serious clinical problem especially in women receiving adequate diet, yet it has been almost universal practice that all pregnant women receive iron

supplementation during pregnancy. It has been suggested that iron supplementation in these women may increase blood viscosity and thus possibly impair placental circulation and fetal growth .

The increased risk of neural tube defect in obese women may not be modified by folic acid supplementation of dosage of 400 microgram/day.

Pregnant teenagers who have energy-dens micronutrient. Poor diet are also at risk of poor obstetric outcome, suggesting of possible rate for increased folic acid in this group.

Daily iron and folic acid supplementation

Reduce the risk low birth weight ,maternal anemia and iron deficiency .

Suggested scheme for daily iron and folic acid supplementation in pregnant women is presented in table 1:

Supplement composition	Iron 30-60 mg of elemental iron, folic
	acid 0.4 mg.
Frequency	One supplement daily.
Duration	Throughout pregnancy. Iron and folic
	acid supplementation should begin as
	early as possible.
Target group	All pregnant adolescent and adult
	women.
Setting	All setting.

Its estimated that 41.8% of pregnant women worldwide are anaemie. At least half of this anramie burned is assumed to be due to iron deficiency. Member states have requested guidance from the world Health organization on the effectiveness and safty of daily iron and folic acid supplementation in pregnant women as public health measure to improve pregnancy out comes in support of their efforts to achieve the millennium Development Goals. A pregnant women is considered to anaemic if her hemoglobin concentration during the first and third trimester of gestation is lower than 110g/L, at sea level, in the second trimester of pregnancy, the hemoglobin concentration usually decrease by approximately 5g/l.

Law hemoglobin concentration indicative of moderate or sever anemia during pregnancy have been associated with an increased risk of premature delivery, maternal and child mortality, and infectious disease.

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Iron deficiency anaemia may effect growth and development both in utero and in long term.

Hemoglobin concentration greater than 130 g/l at sea level may also be associated with negative pregnancy outcomes such as premature delivery and low birth weight.

1-9 How are babies affected by their mothers iron supplementation?

During pregnancy, a women's iron needs increase .because its important to get enough iron while you're pregnant, as well as ,when your nursing, your doctor may suggest taking iron supplements. But the extra iron won't affect your baby.

The iron in your supplement won't affect your baby, however,

developing baby is your body's priority during pregnancy, so your natural iron stores will go to your baby first>>

If your iron stores aren't enough for both you and your baby, however, you could develop anemia.

Anemia during pregnancy increased the risk of premature delivery and having an underweight baby.



2-1 Results and Discussion:

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The study was performed in the maternity and children's hospital in Diwaniyah city, the clinical information of pregnant woman samples shown in the tables below were obtained them by asking pregnant women if they have enough health care in the pregnancy period like taking folic acid and vitamins during pregnancy while monitoring the level of hemoglobin of blood during duration of pregnancy. Where it was found that pregnant women who taken folic acid in the quantity prescribed by the competent doctor

	length of	Blood	folic
pregnant name	pregnancy	ratio	acid
sample 1	26week	10.5	posetive
sample 2	32week	10	posetive
sample 3	30 week	8	negative
sample 4	36 week	11	posetive
sample 5	29 week	7	negative
sample 6	30 week	10.7	posetive
sample 7	27 week	10.8	posetive
sample 8	32 week	6.5	negative
sample 9	34 week	10.8	posetive
sample 10	30 week	8.2	negative
sample 11	36 week	10.2	posetive
sample 12	31 week	5.2	nagative
sample 13	28 week	7.5	nagative
sample 14	35 week	8.1	nagative
sample 15	33 week	10	posative
sample 16	27 week	7.8	nagative
sample 17	26 week	8.4	nagative
sample 18	32 week	10.3	posative
sample 19	29 week	11	posative
sample 20	28 week	7.9	nagative
sample 21	30 week	10	posative

posative	10.8	29 week	sample 22
nagative	9	33 week	sample 23
nagative	8.5	31 week	sample 24
posative	11	26 week	sample 25
posative	10.7	27 week	sample 26
nagative	6.8	32 week	sample 27
nagative	7.6	35 week	sample 28
posative	10.3	28 week	sample 29
nagative	9.1	34 week	sample 30



From the data that obtained from the analysis of pregnant women that reported in them medical cards about medicine care that include the medicine care including the Vaccines and drug, we can concluded effect of folic acid and vitamins on the level of hemoglobin of women who taken these drugs that lead to improve their health state's and subsequently improve the fetus health.

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