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Comparison of the Effect of Balanced Diets Based on Modern and Iranian Traditional (Persian) Medicine on the Anthropometric Indices of Fetuses with Asymmetric Fetal Growth Retardation and Their Mothers: A Randomized Clinical Trial

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Abstract

Introduction: Fetal growth restriction (FGR) is a major public health problem. There is no therapeutic option in cases without cause. Iranian traditional therapists use special foods which according to the laws of Persian (Iranian) medicine promote growth of the body during pregnancy to improve the growth of fetuses with FGR. In this study, the effectiveness of a balanced diet containing recommended Persian (Iranian) medicine sources and a classic balanced diet, in the weight gain of asymmetric FGR fetuses, was compared. Method: A randomized clinical trial was performed on 64 pregnant women with asymmetric causeless FGR. Patients were randomly assigned to two groups and each group received a balanced diet. Types of food were different in the two groups. Biometric ultrasound was repeated every two weeks. Repeated measures analysis of variance was used to assess effect of the intervention on continuous variables during three different measurements including fetal weight; abdominal circumference and mother's weight. Results: In this study, although there was no significant difference between macronutrients and micronutrients (after adjusting for magnesium difference), the weight gain of the fetuses in the intervention group was significantly higher than in the control group ($p<0.001$), similarly, the abdominal circumference of the fetuses was higher ($P=0.002$). However, there was no significant difference in maternal weight gain in the two groups ($P=0.880$). Conclusion: Taking into account previous findings, the potential of treatment via nutrition as a low-complication and non-invasive method should not be ignored in the treatment of FGR.

Keywords: Diets, Medicine, Anthropometric, Fetuses Asymmetric

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Introduction

Intrauterine growth restriction (IUGR) or fetal growth retardation (FGR) refers to fetal weight equal to or less than 10% of the expected weight on the basis of the gestational age(ACOG , 2013).

FGR is a major public health problem and the second cause of mortality and morbidity of newborns after preterm birth (Gabbe and et al., 2016) . Of course, the possibility of mortality and morbidity is directly correlated with increase in FGR severity (Mari and et al., 2007). It is estimated that 30 million newborns are born annually with FGR and 75% of these births occur in Asia and Africa and 5% in Latin America (Blössner & Villar, 1998). The mortality rate of newborns with FGR is 6 to 10 times higher than that with normal intrauterine growth and without considering a group of fetuses with anomalies, of every 1000 FGR pregnancies, 80 fetal deaths are reported. And in those who are alive, the incidence of asphyxia during delivery is estimated to be more than 50% (Gabbe and et al., 2016). This problem can be due to recognizable causes such as maternal tobacco consumption, intrauterine infection, maternal malnutrition, maternal hypertension, maternal chronic illness or fetal abnormalities like chromosomal problems or completely due to unknown causes. After a pregnancy with FGR, in the next pregnancy, the risk is higher than in the general population (Villar and et al., 2006). Neonates with FGR history are at increased risk for prenatal mortality, low birth weight, respiratory disorders, nervous system disorders, metabolic problems and are afflicted with metabolic diseases such as type 2 diabetes and coronary artery disease in adulthood (Barker, 2006; Varvarigou, 2010; Varvarigou, 2010). To deal with this disorder, first and foremost, a diagnosis of the cause is done, if any, and then action is taken to eliminate the cause and provide appropriate conditions for the intrauterine conditions of the fetus. However, there is no therapeutic option in cases where there is no cause but there can be follow-up of fetal conditions with the help of biometric, Doppler and Biophysical profile ultrasound to determine the time and form of delivery to reduce the likelihood of mortality and morbidity. Based on meta-analysis, the efficacy of proposed therapies, such as the administration of sugars or amino acids, increased plasma levels, but administration of oxygen and low-dose aspirin did not have an effect on the improvement of FGR. Even abstaining from smoking and prescribing anti-malarial drugs in cases where FGR has been induced after stabilizing FGR diagnosis, did not have any effect on recovery from the condition and the normalization of fetal growth (Bamfo, & Odibo, 2011). One of the reasons for the disruption of fetal growth is the lack of nutrients to the fetus for various reasons and so, the growth of the fetus is directly related to the mother's diet (Dessì and et al., 2012). In various studies performed on animal specimens, it was found that, by manipulating the mother's diet, FGR can be formed (Fernandez-Twinn, & Ozanne,2006). In the human population, it was also found in an epidemiological study after the Second World War in the Netherlands, the fetus of the mothers who suffered from malnutrition had FGR and in particular, the group whose mothers entered famine during the third trimester of pregnancy had carbohydrate intolerance and metabolic problems in adulthood (Ravelli and et al., 1998). Several studies have confirmed that dietary recommendations or the administration of a balanced diet can reduce the risk of developing FGR (Kramer & Kakuma, 2003). However, in advanced societies, inappropriate diets have not been proven as the cause of FGR but dietary supplements can be effective in improving the weight gain of fetuses and mothers who are underweight (Gabbe and et al., 2016). However, nutritional interventions in mothers with FGR without malnutrition had no effect on the improvement of fetal development (Abu-Saad & Fraser, 2010;Bhutta and et al., 2013; Chong and et al., 2015). Iranian scholars have a great interest in nutrition in both areas of prevention and treatment of diseases. In the field of prevention, one of the six most important principles of health care is attention to food and drink, and prior to administration of medication with intervention in the nutrition of patients both quantitative and qualitative treatment was started (Razi and Al-Hawi, 2001; Naseri, 2004; chaghmini, 1915; Ibnsina, 2005).

According to the laws of Persian (Iranian) medicine, foods have been introduced, regardless of the amount of calories, to provide moisture and warmth in the body, and promote growth (Razi and Al-Hawi, 2001; Naseri, 2004; chaghmini, 1915; Ibnsina, 2005; Nejatbakhsh, 2013). Persian (Iranian) medicine therapists use these foods during pregnancy to improve the growth of fetuses with FGR (Bioos, 2014; Rumi and et al., 2018; Rumi and et al, 2017). Considering that these dietary recommendations are often used by the Persian (Iranian) medical clinics to improve FGR fetus's weight gain, in this study, the authors compared the effectiveness of a balanced diet containing recommended Persian (Iranian) medicine sources and a balanced diet containing common Iranian family meals, in the weight gain of asymmetric FGR fetuses.

Methods

Population:

The present study is a randomized clinical trial performed on 64 pregnant women with asymmetric FGR in a period of eight months from September 2016 to June 2017. FGR was diagnosed in these mothers during a routine examination at the prenatal clinic in AkbarAbadi Hospital affiliated to Iran University of Medical Sciences, Tehran via biometric sonography. The diagnostic procedure according to the American College of Obstetrics and Gynecology guidelines estimated weight below 10% based on the age of pregnancy with the help of Callen standard (Callen & Norton, 2016). According to the Canadian College of Obstetrics and Gynecologists' recommendation, taking abnormal Doppler ultrasound is helpful in better diagnosis of FGR from small for gestational age (SGA). But the most common definition of FGR is below 10%; therefore, the same definition was used to detect FGR (Monteith and et al., 2017).

Inclusion criteria: Mothers without chronic disease, such as diabetes or high blood pressure, failure to show a recognizable cause for FGR, normal Doppler ultrasound, or increased resistance of umbilical artery, absence of severe Oligohydramnios, gestational age of twenty-eight weeks or more, maternal age of more than 18 years, BMI between 18 and 35 and singleton

Exclusion criteria: Profile biophysical disorder during intervention, NST disorder during intervention, mother's reluctance to cooperation, deciding to terminate the pregnancy during the intervention for any reason, not observing at least 70% of the diet with regard to the mean recall, hospitalization during the intervention period.

Sample size was calculated for comparing means in two independent samples based on the following assumptions. In this study, the amount of types I (alpha) and II error (beta) were considered to be 0.05. The expected mean and standard deviation in the intervention and control groups at the end of the study were considered 2420 ± 370 and 2100 ± 340, respectively. Considering that in this study, two variables were adjusted during the analysis, the required sample size, taking into account attrition 10%, was considered to be 64.

After obtaining written informed consent from the subjects, pregnant mothers were allocated to two groups: intervention (n=30) and control group (n=34) based on quadruple random blocks. In order to control the socio-economic factors and the effect of fetal gender, the variables: fetal gender and maternal education were used for blocking to ensure their distribution in the two groups.

This project was confirmed by the Ethics Committee of Clinical Research of the Afzalipour Research Foundation and was conducted in accordance with the Helsinki Treaty. Confirmation ID is IR.KMU.AH.REC.1395.60 and it was registered at the Iranian Center for Clinical Trials Registration (registration code: IRCT2017011631984N1).

Diet design

In this study, in order to design and modify the pregnant mother's diet, Harris Benedict's formula (proportional to pre-pregnancy weight, height and age) was used to calculate the amount of energy needed for daily basal metabolism. The basal energy was multiplied by the coefficient of activity and the amount of energy needed for pregnant women in the third trimester(452 kcal) was added to the calculated energy and the amount of daily energy needed was calculated (Roza & Shizgal, 1984), and finally, the amount of energy was divided according to the exchange list between food groups (Krause, 1979). Intervention group: Traditional balanced diet based on reference texts of Iranian traditional medicine for growth was used. In this group, the diet was designed in such a way that the intake of total energy, protein, fat and micronutrients is proportional to the new nutrition science and similar to the control group but the type of food is different. Food ingredients that lead to growth of the body in accordance with traditional Iranian recommendations were selected from the five books: *Exireazam*, *Quanoon*, *Moalejateaghili*, *Sharholasbab* and *Tebeakbari* and according to the availability and conformity with the current table of Iranians, they were graded and selected in the order of priority and were in the form of dietary foods commonly used by Iranians (Rumi and et al., 2016) (Table 7).

Measurements and follow-up

Intervention

After the entry of the patients, the nutritional status of the mothers was assessed by means of the recall nutritional questionnaire. Then, mothers were randomly assigned to two groups: treatment and control. The treatment and the control group were treated according to the mothers' pre pregnancy BMI and conditions with the classical and traditional diets (Table 7 and 8). Both groups received routine care at the perinatology clinic. The diet was followed for four weeks.

To ensure that the same energy, macronutrients and micronutrients which according to literature are likely to be effective in fetal growth are received, the dietary regimen was examined through the recall questionnaire.

Four feed recall were taken from each patient, one before intervention and three questionnaires were taken every 10 days during intervention and recalls were calculated by food processor software.

Examination of consequences

Biophysical profile of fetus was repeated each week (fetal health score based on the number of breath and movement, heart rate and amniotic fluid by ultrasound) and biometric ultrasound was repeated every two weeks. So, for each patient, three fetal weights and three abdominal circumferences were recorded, one before the intervention and two every two weeks for each mother; three weights were recorded using the balance, one before the start of the intervention and two every two weeks.

The results recorded in three recall questionnaires which were taken during each intervention from each patient were averaged and the mean value was used to compare the two groups.

Statistical analysis

The statistical package for social sciences (SPSS) software version 22 was used for the statistical analysis. Variables were assessed for normality based on the Shapiro-Wilk test. Baseline characteristics of the intervention and control groups were compared using t-test for continuous variables and Chi-square test for categorical variables. Repeated measures analysis of variance (ANOVA) was used to assess the effect of intervention on continuous variables during the three times measurement including fetal weight, abdominal circumference and mother's weight.

In the test of variance analysis with repeated measurements, Mauchly's test was used for checking the homogeneity of variance and correlation over time (spherical assumption). Greenhouse-Geisser modified test was used when the condition was violated, to examine the effects of intervention over time and interaction between group and time. To test homogeneity of variance, Box's test was used. 0.05 was considered as statistical significance level.

Results

In this study, 34 cases were in the control group and 30 in the intervention group. (diagram1)

In the control group, 44% were female fetus and 56% were male fetus but the percentage of males and females in the treatment group was the same.

Table 1 shows comparison of the mean baseline variables in both treatment and control groups. The mean age of the control and intervention group at the beginning of the study was 27.00 ± 5.2 and 28.57 ± 4.4, respectively and there was no significant difference between the mean age of the two groups ($p= 0.2$). Also, the mean maternal weight, pre-pregnancy BMI, gestational age, weight and abdominal circumference of the fetuses were not significantly different at the beginning of the study (Table1).

Table 2 compares the status of important nutritional factors between the control and the intervention group. The results show that the conditions for receiving energy and macronutrients did not differ between the two groups and also, there was no significant statistical difference between the groups with regards to important micronutrients (except magnesium).

Comparison of the mean fetal weight in each group by using the pair t-test shows that, the fetal weight increased over time in both groups and there was a statistically significant difference ($p <0.001$) but the weight gain slope in the intervention group is higher, and the increase in abdominal circumference slope in the intervention group was higher too but in maternal weight, the weight gain slope in the two groups is statistically similar (Table 3).

Table 4 shows the mean values of the fetal weight based on repeated measure of variance analysis (adjusted for gestational age and mean magnesium intake) over time, in the intervention and control groups. This analysis indicates that, in general, the mean weight in the intervention group was more than in the control group by 131.85 and it is statistically significant. ($F = 25.4$; $p <0.001$) (Diagram2).

Table 5 also shows the adjusted mean values of the abdominal circumference of the fetus based on the analysis of repeated measure of variance (adjusted according to the gestational age and mean magnesium intake) over time in the intervention and control groups (Table 6 and Diagram 2). This analysis indicates that, overall, the fetal abdominal circumference in the intervention group is higher than in the control group by 0.453 ($F = 10.270$; $P = 0.002$) (Diagram3).

Table 6 shows the adjusted average maternal weight based on repeated measure of variance analysis (adjusted according to the gestational age and mean magnesium intake) over time in the intervention and control groups. This analysis indicates that, in general, the weight of mothers in the intervention group was more than that in the control group by 0.16 which is not statistically significant ($F = 0.023$; $P = 0.880$). The weight gain slope is similar in the two groups (Diagram 4).

Discussion:

This is the first study on evaluation of a diet based on Persian (Iranian) medicine and a classic diet with regards to increase in the weight of embryos with asymmetric unexplained FGR.

In this study, although, there was no significant difference between macro and micronutrients (after adjusting for the magnesium difference), the weight gain of the fetuses in the intervention group was significantly higher than in the control group; similarly, the abdominal circumference of the fetuses was higher in the intervention group than in the control group. However, there was no significant difference in maternal weight gain in the two groups.

Achieving optimal weight for mother and fetus during pregnancy is directly related to adequate nutrient intake (Wu and et al., 2004). Evidences suggest that in fetuses that their mothers have insufficient weight gain during pregnancy, the probability of prematurity is greater than in fetuses with appropriate maternal weight (Belkacemi and et al., 2010). In animal studies with reduced intake of energy or decreased protein intake, FGR was developed in the fetus. According to pathologic studies in these animals, due to inadequate energy or protein intake, the placenta remained inefficient and small and the secondary result is the incidence of FGR (Jansson and te al., 2006 Pantham and et al., 2016;Rutland and et al., 2007). In several cohort studies that target mothers' nutritional conditions, it is known that regardless of the amount of energy, the type of food intake also has effect on the weight of the mother and fetus. For example, in a study in Japan, the fetus of mothers whose diet contained rice and fresh vegetables as compared to fetus of mothers whose main diet was bread, had better weight gain (Grieger & Clifton, 2014; Okubo and et al., 2012). According to epidemiologic studies in humans, a balanced diet of lamb meat, low-fat dairy products, and adequate fruits and vegetables can be effective in optimal mother weight gain and consequently fetal development during pregnancy (Grieger & Clifton, 2014). In nutritional interventions in humans, in terms of malnutrition, improving nutritional conditions during pregnancy has been effective in weight gain of FGR fetuses (Ceesay and et al., 1997;Dessì and et al., 2012). However, in multiple examinations in mothers without malnutrition, nutritional interventions had no significant effect on the improvement of fetal weight (Chong and et al., 2015;Imdad & Bhutta, 2012). In this study, the results obtained for the control group after receiving a balanced diet confirmed the results of those studies. But in the intervention group, despite the same energy and macronutrients intake as compared to the control group, weight gain was significantly higher. This finding is also consistent with those of studies that used these types of food for weight gain of the fetus and mother. However, in the treatment of unconditioned fixed FGR, neither food nor its amount was effective (Bamfo and et al., 2011; Gresham and et sl., 2014). Given that there is widespread evidence of placental disorder in FGR and nowadays, it is the main cause of asymmetric FGR, it is introduced with unknown cause (Bamfo and et al., 2011). It seems that any treatment that will improve the weight gain of these fetuses should, of course, improve the blood flow of the placenta. The placenta is an active metabolite that secretes hormone and takes nutrients to the fetus. It eliminates waste materials, so, proper functioning and size of the placenta are vital in the health and well-being of the fetus. In the presence of adequate food and absence of secondary causes of FGR, the fetus has inadequate growth; therefore, it can be concluded that the transfer of food to the fetus is done by the placenta. Considering that according to the Persian (Iranian) medicine resources, the result of digestion of light (*latif* in Persian) and easy to digest (*sahlolhazm* in Persian) foods with warm and wet quality (*keifiate garm va tar* in Persian) makes the product to be quickly absorbed and pass through the narrow passages easily, it can be concluded that, in the intervention group, the type of food and compliance with nutrition rules in Persian (Iranian) medicine led to an improvement in blood supply of placenta and hence improved nutrient delivery to the fetus. Although, the weight of mothers in the two groups did not differ significantly, weight gain of the fetuses was better in the intervention group. In this project, given that Iran is a country of four seasons, access to some foods, such as fruits and vegetables, is limited in different seasons. But the regime was the same in order to reduce the probability of fault in all the seasons. The Iranian women's desire for self-induced cesarean section in private clinics also made it problematic to properly examine the type and cause of childbirth.

The authors suggest that this plan should be repeated with more patients; also, the Doppler ultrasound should be recorded and analyzed to verify the hypothesis proposed in this design.

Conclusion

Taking into account previous findings could provide effective clinical facilities for the treatment of challenging diseases such as IUGR, which would yield astonishing therapeutic results in combination with modern medicine. In this regard, the potential of treatment via nutrition as a low-complication and non-invasive method should not be ignored in the treatment of diseases.

Competing Interests

The authors have no conflict of interest in the publication of this paper.

Contributing Authors

This paper presents the results of the research conducted by Dr. Yalda Rumi and Dr. Mitra Mehrabani. Patient visits and ultrasounds were performed by Dr. Shahrzad Hashemi. Dr. Gholamreza Mohammadi Farsani supervised the diet planning. Dr. Seyed mohammad riahi performed statistical analysis and he, Dr. Roshanak Mockaberinejad and Dr. Yalda Rumi were involved in writing of the article.

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Table 1: Comparison Mean (SD) of baseline variables in the treatment and control groups

Group	Age	Fetal weight1	Gestational age	Maternal weight1	AC1	BMI
Treatment group	28.57 ±4.4	1519± 340.5	231.57 ±13.1	72.28 ±8.6	25.85 ±1.8	23.25 ±0.46
Control group	27.00 ±5.2	1410±266	228.12 ±11.8	71.58 ±6.1	25.46 ±1.5	23.08± 0.39
P value	0.20	0.15	0.27	0.71	0.37	0.79

Note: AC=abdominal circumference; BMI=body mass index

Table 2: The Mean (SD) intake of micro and macronutrients during dietary intervention in the treatment and control group

Group	Protein	Fat	Carbohydrate	Iron	Magnesium	Folate	Cobalamin	Energy
Treatment group	60±8.5	83±11.6	252±30.7	12±3.2	243±36.2	293±53.5	2.2±0.76	1962±122
Control group	58±10	80 ±15.1	248 ±30.9	11.5 ±2.8	225 ±31.4	285 ±73.1	2.1± 0.65	1925 ±128
P value	0.39	0.48	0.57	0.36	0.033	0.69	0.44	0.25

Table 3: Comparison of mean fetal weight, abdominal circumference and maternal weight in the control and intervention groups using independent and paired t test.

variable	N	group	Week0 Mean± SD	Week2 Mean± SD	Week4 Mean± SD
FW	30 34	Treatment Control pvalue	^{c}2419.10±370.3 ^{a}1410.74±266.7 0.16	^{b}1976.37±372.2 ^{b}1745.21±290.1 0.007	^{a}1519.23±340.5 ^{c}2100.29±305.5 >0.001
AC	30 34	Treatment Control pvalue	^{a}25.85±1.8 ^{a}25.46±1.5 0.382	^{b}28.23±2.0 ^{b}27.22±1.5 0.029	^{c}30.20±1.7 ^{c}28.97±1.4 0.004
MW	30 34	Treatment Control pvalue	^{a}72.28±8.6 ^{a}71.58±6.1 0.709	^{b}73.88±8.6 ^{b}73.44±5.9 0.810	^{c}75.31±8.4 ^{c}74.54±6.0 0.674

Note1: The unnamed lowercase English letters indicate a significant difference in less than 0.001 level between three time intervals in each group by using the paired T-test
Note 2: FW=fetal weight; AC=abdominal circumference; MW=maternal weight

Table 4: Comparison of mean (SD) fetal weight in the control and treatment groups after adjustment by the variables of gestational age and magnesium intake

Group	N	Week0	Week2	Week4
treatment	30	1474.82 ±12.1	1927.56±21.3	2372.65±29.4
control	34	1449.92±11.3	1788.27±19.9	2141.27±27.6

Note: Results of repeated measures analysis of variance: F =25.402; df =1; p=<0.001

Table 5: Comparison of mean (SD) fetal abdominal circumference in the control and treatment groups after adjustment by the variables, gestational age and magnesium intake

Group	N	Week0	Week2	Week3
treatment	30	25.62± 0 .102	27.99±0 .125	29.99±0 .114
control	34	25.66 ±0 .096	27.43 ±0 .117	29.15 ± 0 .107

Note. Results of repeated measures analysis of variance: F =10.270; df =1; p=0.002

Table 6: Comparison of the mean (SD) weight of mothers in the control and treatment groups after adjustment by the variables, gestational age and magnesium intake

Group	N	Week0	Week2	Week3
Treatment	30	72.0±1.3	73.6±1.3	75.1±1.3
Control	34	71.7±1.3	73.6±1.2	74.7±1.2

Note. Results of repeated measures analysis of variance: F =0.023; df =1; p=0.880.

Table 7: diet plan based on Persian (Iranian) medicine

Breakfast 8 am	*Harire badam**, bread & honey	Rice-milk, bread & honey	Eggs & bread	Butter & carrot /quince jam	*Halim**, sugar & cinnamon	Almonds, bread & honey	Milk-rice & honey
Lunch 12 pm	Mung,rice & lamb	Lamb Kebab& Bread & & basil	Rice , chicken kebab & olives	*Abgoosht**, bread & basil	Rice with quince & prunes stew	Rice , lamb kebab & basil	Abgoosht*, bread & basil
Dinner	Chicken	Bread & barley	Milk-rice	lamb, carrot,	Bread & barley	Nargessi*&	Chicken

8 pm	Kebab & bread	soup	& bread	green beans & bread	soup	bread	kebab & bread
Snack I 10 am	Milk & dates	Apple juice	Apple juice	Milk and dates	Milk and dates	Milk and honey	Apple juice
Snack II 4 pm	Sweet Pomegranate	Dried Figs & almonds	Almond and raisins	Sweet Pomegranate	Almond	Apple	Sweet Pomegranate
Before sleep	Milk & honey	Milk & honey	Milk & dried figs	Milk	Milk	Milk & dried figs	Milk & honey

Note:

harire badam in Persian language which is a kind of Pudding containing almond and rice floor

halim in Persian language which is a kind of supp containing lamb and wheat and ate with sugar and cinnamon

abgoosht in Persian language which is a kind of broth containing lamb meat, chick pea, rice, potato spices like cinnamon, turmeric

Nargessi in Persian language which is a kind of omelets containing cooked spinach with fried egg

Table 8: diet plan based on classic medicine.

Breakfast 8 am	Walnut, bread, cheese, cucumber, tomato	Bred, egg, tomato, milk	Boiled lentils and bread	Bred, egg, tomato	Walnut, bread, cheese, cucumber, tomato	Walnut, bread, cheese, cucumber, tomato	Bread, butter, jam or honey
Lunch 12 pm	Rice, Stew, Green vegetables	Kebab, Rice, Salad salad	*Tahchin*, salad	Rice, Stew, yogurt	Rice , Kebab, yogurt	*Tahchin*, yogurt	Rice, Stew, Salad salad
Dinner 8 pm	Soup, bread	Soup, bread	Meat cutlet, bread	Meat stew, bread,	Baked beans bread, salad	Bread & chicken	Olivier salad, Tomato, bread
Snack I 10 am	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt
Snack II 4 pm	fruit	fruit	fruit	fruit	fruit	fruit	fruit
Before sleep	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt	Milk or yogurt

Note:

tahchin: Rice cooked with yogurt, egg, meat and saffron

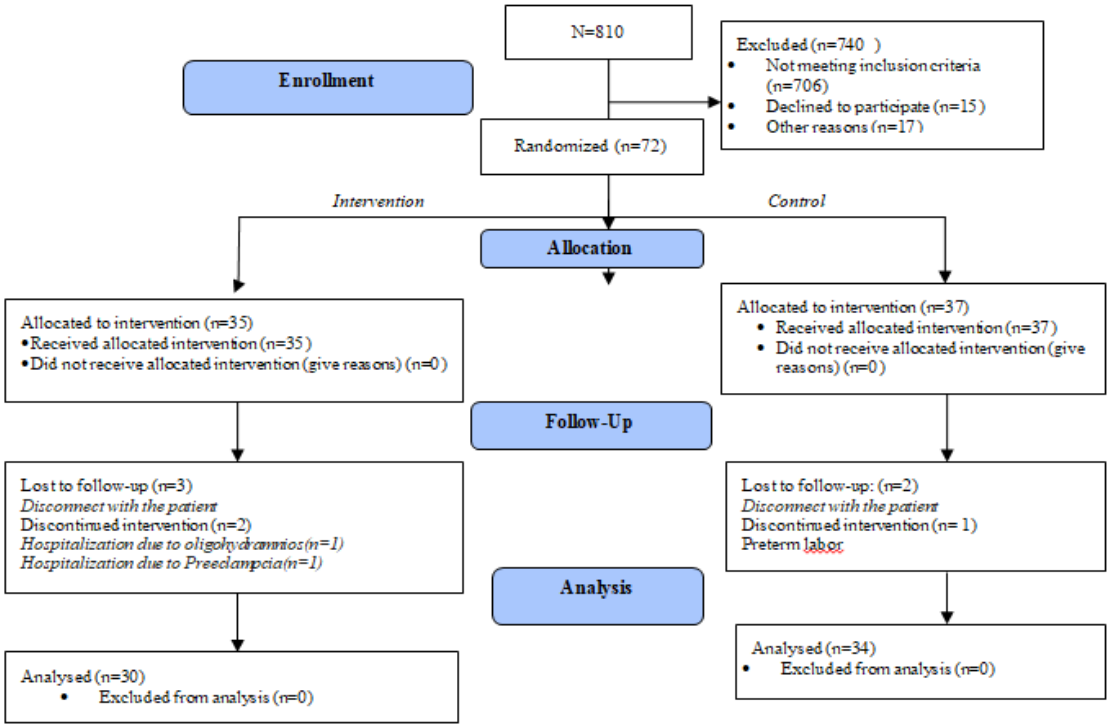

Diagram 1: consort flow diagram

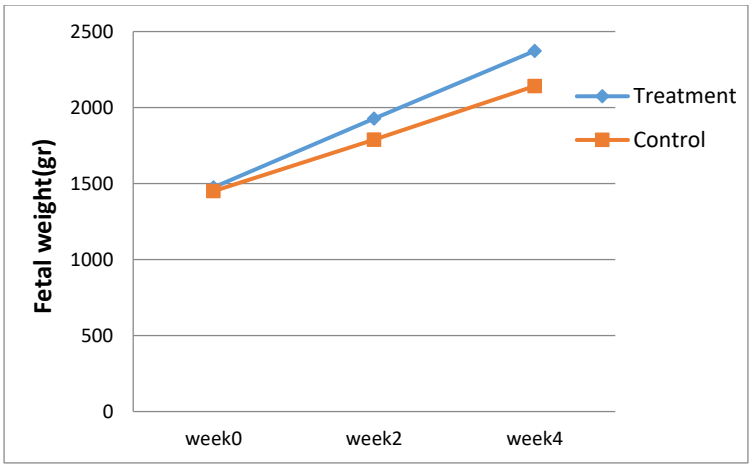

Diagram 2: Comparison of fetal weighting in the two groups over time and after adjusting the gestational age and the amount of magnesium

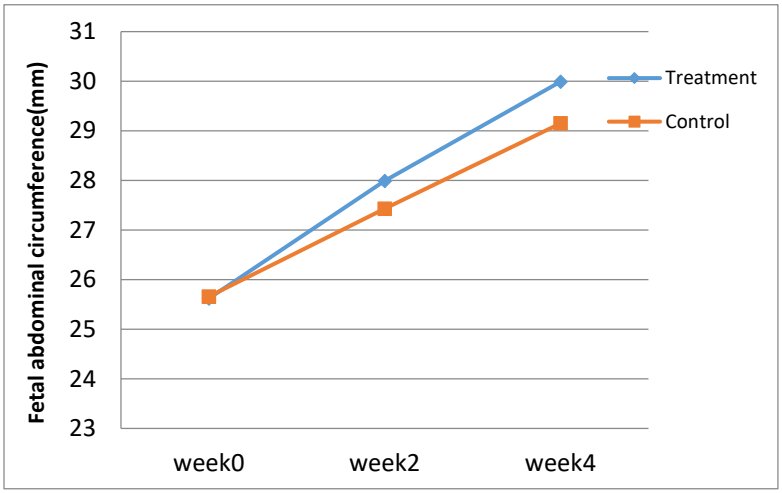

Diagram 3: Comparison of the fetal abdominal circumference in the two groups over time and after adjusting the gestational age and the amount of magnesium

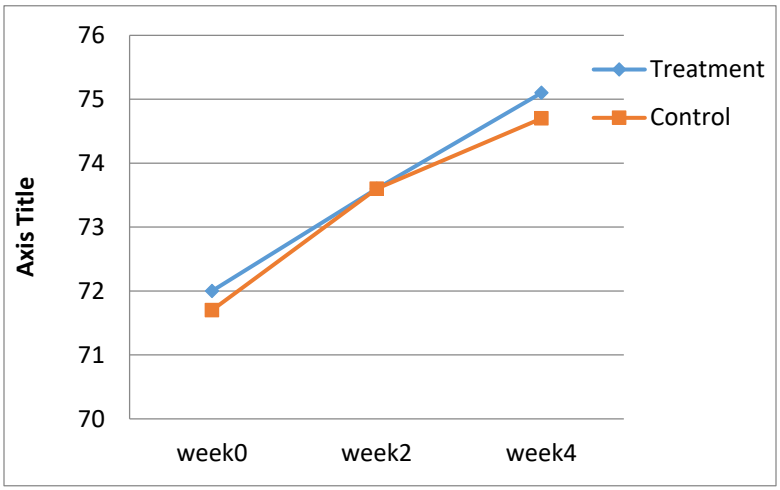

Diagram 4: Comparison of maternal weight in both groups over time and after adjusting the gestational age and magnesium rate