

BENEFICIAL EFFECTS OF OMEGA- 3 POLY UNSATURATED FATTY ACIDS IN GESTATIONAL DIABETES MELLITUS EFFECTS ON MACROSOMIA AND RISK OF DEVELOPING TYPE 2 DIABETES

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ABSTRACT:

Aim and Objectives

The aim of the study is to determine beneficial effects of omega- 3 poly unsaturated fatty acids in gestational diabetes mellitus effects on macrosomia and risk of developing type 2 diabetes. Longitudinal interventional study to ensure the even distribution of all patients among groups. 2200 eligible participants were enrolled for the study. It was divided into two groups. Group A- 1100 patients. It was interventional group. Group B-1100 patients. It was control group. Collected the data from the patients. Clinical Parameters: FBS, PPBS were measured by using the standard procedure employed in the standard laboratory.. Data collected for the study was tabulated and the result analysis was done using Microsoft excel and IBM SPSS (17.0). paired t test was used. Unpaired t test was used to determine the significance between the control and interventional group. The effects were found to be significant at 5% level of significance. Women who had gestational diabetes mellitus had 24% macrosomic delivery than women without gestational diabetes mellitus (8.94%). Before counselling 36(24%) babies were born in gestational diabetes women. 85(8.96%) babies were born in non-gestational diabetes women. After counselling 14(9.3%) babies were born in gestational diabetes women. 41(4.31%) babies were born in non-gestational diabetes women. After counselling was reduced 9.3% of macrosomic delivery. In addition, women who were diagnosed with gestational diabetes mellitus are 2% at risk of developing Type 2 diabetes mellitus.

Key Words: Gestational diabetes, macrosomia, Omega-3 poly unsaturated

fatty acids, Type 2 diabetes, Patient counselling, treatment of Gestational diabetes.

INTRODUCTION

GESTATIONAL DIABETES mellitus (GDM), is a carbohydrate intolerance of unstable strictness. It's the most common metabolic disorder of pregnancy, affecting all pregnancies ranging 1–10%. Though many are with GDM goes back to normal level post-delivery, they have a high risk of developing diabetes, mainly type 2 diabetes mellitus (DM), later, with an incidence ranging from 6-62%, and depend upon the population tested and the length of the follow-up considered^[1,2]. Women offspring with GDM are likely to get opposing side effects (Ex: Macrosomia) which leads to respiratory distress syndrome, fetal death, prematurity, and birth trauma; and equally important, these offspring have a high risk of developing obesity, impaired glucose tolerance, and type 2 diabetes in adulthood^[3,4,5].

Adiponectin is a physiologically active polypeptide hormone derivative from adipose tissue, exhibit insulin-sensitizing, antiatherogenic, and anti-inflammatory properties Cytokines, can interfere with insulin signaling is implicated in insulin resistance in type 2 DM^[6]. Although the effect of adiponectin in insulin sensitivity has been studied, limited data are available on the relation between adiponectin and pregnancy-induced insulin resistance. Moreover, hypoadiponectinemia is associated with the pathogenesis of GDM and macrosomia^[7,8].

MATERIALS AND METHODS:

This is a longitudinal interventional study. It is conducted to determine the beneficial effects of omega- 3 poly unsaturated fatty acids in gestational diabetes and non gestational diabetic pregnant women. Total duration of this study is 4 years. Totally 2200 eligible participants were enrolled for the study. The sample size was calculated using 90% confidence interval. It was divided into two groups. Group A is the Interventional Group and it contains 1100 patients. In Group A 150 patients have Gestational diabetes and 950 pregnant women are with Non-gestational diabetes.

Group B is the control group and it contains 1100 participants. In group B 125 patients are with gestational and 975 pregnant women with non gestational diabetes. For group A given counseling on vegetarian and non vegetarian diet chart. Patient education through patient information leaflet (PIL). Life style management, guidance and telephone follow up and patient data was

collected. For group B counseling was not given. The study was carried out at Arun hospitals, kovilambakkam and Mega family clinic, keelkattalai. The hospital and clinic has more medical disciplines managed by highly qualified and trained full time medical specialists. Patient selection was done based on inclusion and exclusion criteria. Pregnant women at any age with gestational and non gestational diabetes were included. Gestational diabetes with thyroid or any other disorders were excluded. Clinical parameters like FBS, PPBS were measured using standard procedure.

RESULTS

TABLES

Table 1(Group A) Participants Distribution

Participants	No.of Patients	% Of Patients
	1100	
Gestational Diabetes	150	13.63
Non-Gestational diabetes	950	86.36

Table 2 (Group B) Participants Distribution

Participants	No.of Patients	% Of Patients
	1100	
Gestational Diabetes	125	11.36
Non-Gestational diabetes	975	88.63

Table 3 (Group A) Distribution on Age (Gestational diabetes patients)

Age	No.of Patient N=150	% of Patients	P Value
18-25	52	34.6	<0.0001
26-30	48	32	
31-35	35	23.3	

36-40	15	10	
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Table 4 (Group B) Distribution on Age (Gestational diabetes patients)

Age	No.of Patient N=125	% of Patients	P Value
18-25	40	32	<0.0001
26-30	41	32.8	
31-35	32	25.6	
36-40	12	09.6	

Table 5 (Group A) Distribution on Age (Non-Gestational diabetes patients)

Age	No.of Patients N=950	% of Patients	P Value
18-25	399	42	<0.0001
26-30	266	28	
31-35	209	22	
36-40	76	08	

Table 6 (Group B) Distribution on Age (Non-Gestational diabetes patients)

Age	No.of Patients N=975	% of Patients	P Value
18-25	409	41.9	<0.0001
26-30	271	27.7	
31-35	214	21.9	
36-40	81	08.3	

Table 7 (Group A) Distribution on Macrosomia

Participants	No.of Patients 1100	Macrosomia	% of Macrosemi a Patients	Non- Macrosomia Patients	% Of Non- Macroso mia	P Value
Gestational Diabetes	150	14	9.3	136	90.6	<0.0001
Non-Gestational diabetes	950	41	4.3	909	95.68	

Table 8 (Group B) Distribution Based on Macrosomia

Participants	No.of Patients 1100	Macrosomia	% of Macrosemi a Patients	Non- Macrosomia Patients	% Of Non- Macroso mia	P Value
Gestational Diabetes	125	34	27.2	91	72.8	<0.0001
Non-Gestational diabetes	975	87	08.9	888	91.07	

Table 9 (Group A) Distribution Based On Macrosomia (Gestational Diabetes and Non Gestational Diabetes)

Participants	No.of Patients 1100	Macrosomia	Total Macrosomia (n₁+n₂)	% of Macrosomia	P Value

Gestational Diabetes (n ₁)	150	14	55	5	<0.0001
Non-Gestational diabetes (n ₂)	950	41			

Table 10 (Group B) Distribution Based on Macrosomia (Gestational Diabetes and Non Gestational Diabetes)

Participants	No.of Patients 1100	Macrosomia	Total Macrosomia (n₁+n₂)	% of Macrosomia	P Value
Gestational Diabetes (n ₁)	125	34	121	11	<0.0001
Non-Gestational diabetes (n ₂)	975	87			

Table 11 (Group A) Distribution Based on Risk of Developing Type 2 Diabetes

Participants	Total No.of Patients	No. of Patients Developed Type 2 Diabetes	% of Patients Developing Type 2 Diabetes
Gestational Diabetes Patients	150	03	02

Table 12 (Group B) Distribution Based on Risk of Developing Type 2 Diabetes

Participants	Total No.of Patients	No. of Patients Developed Type 2 Diabetes	% of Patients Developing Type 2 Diabetes
Gestational Diabetes Patients	125	03	02

Table No 13 (Group A) Distribution on Child

CHILD	NO.OF.PATIENTS N=150	% OF PATIENTS	P VALUE
1	83	55.3	<0.0001
2	55	36.6	
3	12	08	

Table 14 (Group B) Distribution on Child

Child	No.of.Patients N=125	% of Patients	P Value
1	71	56.8	<0.0001
2	47	37.6	
3	07	05.6	

Table 15 Distribution based on baby weight

Macrosomia baby weight(Group B)	Macrosomia baby weight (Group A)	P Value
>4±1.5	<3.5±0.4	<0.0001

Table 16 Comparison of macrosomia interventional and control group

Participants	Macrosomia (control group) Group B	% of Macrosomia Patients Group B	P Value	Macrosomia (Interventional group) Group A	% of Macrosomia Patients Group A	P Value
Gestational Diabetes	36	24	<0.0001	14	9.3	<0.0001
Non-Gestational diabetes	85	8.94		41	4.31	

Table 27**Blood glucose**

Baseline characteristics	Group A			Group B			
	3 rd month	6 th month	9 th month	3 rd month	6 th month	9 th month	
FBS(mg/dl)	230.1±40.6	180.1±30.5	150.1±20.5	240.1±40.6	235.1±30.5	230.1±20.5	<0.0001
PPBS	140.2±30.5	130.2±20.5	120.1±10.2	170.2±30.5	160.2±20.5	155.1±10.2	<0.0001

CONCLUSION

- Results from this study suggested that gestational diabetes mellitus is a significant risk factor for macrosomia. Women who had gestational diabetes mellitus had 24% macrosomic delivery than women without gestational diabetes mellitus (8.94%).
- Before counseling 36(24%) babies was born in gestational diabetes women. 85(8.96%) babies was born in non-gestational diabetes women. After counseling 14(9.3%) babies was born in gestational diabetes women. 41(4.31%) babies was born in non-gestational diabetes women.
- After counseling it was reduced 9.3% of macrosomic delivery

- In addition, women who were diagnosed with gestational diabetes mellitus are 2% at risk of developing Type 2 diabetes mellitus.

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