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RESEARCH ARTICLE

TO STUDY EFFECT OF MEDICAL NUTRITION THERAPY IN PATIENTS OF GESTATIONAL DIABETES MELLITUS

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Abstract

Aim: To study effect of medical nutrition therapy on patients with gestational diabetes mellitus.

Design: This is an prospective observational study and techniques used are clinical and noninvasive**.**

Methods: The prospective observational study was conducted on 890 antenatal subjects attending antenatal clinic at tertiary care hospital during their second trimester of pregnancy. The study was conducted from 1st march 2021 to 31st august 2022.DIPSI criteria recommended by FOGSI and FIGO(2020) for GDM was used . Single step test was used irrespective of last meal and cutoff value of> 140 was used [after 2 hours] to diagnose GDM. All the subjects were followed till delivery and we're divided in two groups on the basis of sugar charting 24 hours before starting any treatment.

Statistical Analysis: Data was analysed using IBM- Statistical Package for Social Sciences (SPSS) version 23.0. Frequency distribution, percentages and Chi square test and spearson correlation test was used for statistical analysis. P value <0.05 was considered significant.

Results: Out of 890 cases ,84 cases were screened positive .Hence incidence of GDM in present study was 9.4%.24 hours sugar charting was done and those who were having normal sugar profile around 65 patients were kept on observation only and around 17 were managed by medical nutrition therapy and other require pharmacotherapy.

Conclusion: In Indian context, screening for GDM is essential in all pregnant women as the Indian women have 11 fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women. Simple test which is economical, feasible,does not require long stay or frequent visit to hospital is and causes least disturbance to pregnant women'sdaily activities is required. DIPSI as a diagnostic tool for GDM issimple,one step, low cost and veryconvenient.An early diagnosis is always better as it gives enough .time to correct and prevent complications.Medical nutrition therapy is very much effective way to treat gestational diabetes mellitus as it doesn't harm baby as well as no side effects are there in this therapy.

Abbreviations: Gestational diabetes mellitus-GDM,diabetes in pregnancy and study group-DIPSI.

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Introduction:-

Although type 2 diabetes mellitus during pregnancy (DIP) causes hyperglycemia in pregnancy (HIP), it is gestational diabetes mellitus (GDM) that remains the major cause of HIP [1].DIP, either antedating or detected during pregnancy, is the more hazardous form of HIP, producing severe hyperglycemia early in pregnancy, which persists postpartum. On the other hand, GDM causes mild hyperglycemia late in pregnancy, which usually disappears after delivery[1-2]. As normal pregnancy advances, it causes insulin resistance. The resulting hyperglycemia is compensated for in healthy women by pancreatic beta cell hyperplasia, which can meet the additional metabolic demands. However, in GDM, there is an inadequate compensation, due to multiple genetic and environmental factors, causing hyperglycemia [2].Its prevalence is raised depending on diagnostic criteria and the presence of different risk factors such as maternal age and body mass index (BMI); prevalence of overt diabetes; population ethnicity; genetic, social, and environmental factors [3–6].

The etiology of GDM is multifactorial and has not been completely understood. However, GDM carries a serious risk of feto-maternal, neonatal mortality and morbidity [7], and the lifelong risk of obesity, type 2 diabetes mellitus and cardiovascular diseases in the mother and child later in life.[8–11]

The most important risk factors are maternal overweight and obesity, age greater than or equal to 35 years at delivery, hypertension, metabolic syndrome, nonwhite ethnicity, family history of diabetes mellitus, prior unexplained stillbirth, prior infant with congenital anomaly (if not screened during that pregnancy), prior macrosomic infant, history of gestational diabetes, chronic use of steroids, glycosuria, and known impaired glucose metabolism.[12]

Therefore, it is critical for all countries to align themselves to the latest research on every aspect of GDM, from screening to management, and the critical long-term follow-up after delivery. The lack of a uniform global approach to GDM remains one major roadblock plaguing GDM and our prospects of turning the tide on the T2DM epidemic [13, 14]. Present study was conducted with the aim to know the usefulness of medical nutrition therapy in management of gestational diabetes mellitus.

Materials and Methods:-

This was a prospective observational study, conducted in the OPD of Obstetrics and Gynaecologydept at tertiary care hospital. All procedures followed were in accordance with the ethical standards of the Institutional Committee. Informed consent was obtained from all patients for being included in the study. All antenatal women coming to OPD at 24-28 weeks of gestation were taken for testing,met inclusion criterias(excluding known cases of diabetes).

Simple random sampling was done to do OGTT for antenatal women coming to OPD.Before doing OGTT,women were briefed about the study and those who given consent regarding study were included.Single step testing using 75 gm anhydrous glucose and measuring blood sugar 2 hours after ingestion was used by DIPSI criteria.

75 gm of anhydrous glucose was given orally after dissolving in approximately 300 ml water whether the pregnant women comes in fasting or nonfasting state , irrespective of last meal .The intake of solution ensured to be completed within 5-10 minutes.Venous sample had been taken after 2 hours of ingestion of solution and sent for blood sugar testing. The threshold blood sugar level > 140 mg/dl (more than or equal to 140)was taken as cutoff for diagnosis of gestational diabetes mellitus.Those who were screened positive went for sugar charting 24 hours before deciding the management whether to start medical nutrition therapy and how much it is effective.Fasting blood sugar ,before lunch and before dinner monitoring was done for whole day and after that management was decided.Patients were initially put on diet modification for 2 weeks and then put on pharmacotherapy if required as menifested by suboptimal blood glucose levels.
All patients were followed till delivery and their maternal and fetal outcomes were studied.The maternal outcome parameters noted were pregnancy induced hypertension,induction of labour,cesarean section of vaginal delivery whereas fetal parameters were birth weight ,macrosomia ,fetal growth restriction,admission in Nicu,apgar score.

Statistical Analysis:
Data was analysed using IBM- Statistical Package for Social Sciences (SPSS) version 23.0. Frequency distribution, percentages and Chi square test and spearson correlation test was used for statistical analysis.

Result:-

Total 890 subjects in the second trimester of pregnancy fulfilling the inclusion criteria and who consented to participatewere screen for GDM. Total84 subjects were diagnosed as GDM by using DIPSI test,hence incidence of GDM is 9.4% in our study. 824 subjects were followed up till delivery. Out of 84 GDM mothers 65 patients didn't require any treatment and 17 patients were managed by medical nutrition therapy and rest 2 require pharmacotherapy.

Table No.1:- Incidence Of Gdm By Dipsi Criteria.

SN	CASES	INCIDENCE	PERCENTAGE
1	**NO OF GDM CASES**	**84**	9.4% **[P VALUE<0.05]**
2	NON GDM SUBJECTS	806	90.06%
	TOTAL	890	100%

Discussion:-

The incidence of gestational diabetesmellitus isincreasing as a result of higher rates of obesity in the general population and more pregnancies in older women. In our study, out of 890 subjects, 9.4% were found to be OGTT positive. Similar incidence was reported in a **cross sectional study done in Pakistan in 2016 at Tertiary care hospitals of two metropolitan cities and shows high frequency of GDM, 11.8 % irrespective of risk factors.[12]. A hospital-based cross-sectional study, done in an ante-natal clinic (ANC) at a sub-district hospital (SDH), Faridabad district of Haryana, India in may 2022 and found incidence of GDM14.1% according to IADPSG criteria and 6.7% according to DIPSI criteria, respectively.[13]**

The adverse maternal complications include hypertension, preeclampsia, urinary tract infection, hydramnios, increased operative intervention and future DM. In the fetus and neonates it is associated with macrosomia, congenital anomalies, metabolic abnormalities, RDS, etc. and subsequent childhood and adolescent obesity.Cesarean delivery rate was higher in those patients having uncontrollable sugar profile and we're not controlled by medical nutrition therapy.

The study conducted in women with GDM who delivered in the Academic Centre for Woman's and Neonate's Health in Warsaw Poland over the years 2013 and 2014 and found that Patients with GDM are more likely to undergo cesarean section.[14]In present study out of 84 cases of GDM all subjects delivered at term gestation , none of them delivered preterm and it shows good antenatal visits and counseling.A cohort study done at the Northern California Kaiser Permanente Medical Care Program in 2003 showed that the risk of spontaneous preterm birth increased with increasing levels of pregnancy glycemia.[15]In present study, macrosomia was more common among patients with uncontrolled sugar profile.Similar results were found in A case control study conducted in 2012 and 2013, it concludes that macrosomia was most commonly associated with GDM and high fasting glucose.[16]

In present study, 39.3% babies of GDM mother require NICU admission as compared to nongdm mother (8.31%). Respiratory distress was the most common cause for NICU admission and it was found almost same in both groups on mnt as well as on pharmacotherapy.

Conclusion:-

Screening for GDM is usually done at 24-28 weeks of gestation because, Insulin resistance increases during the second trimester and glucose levels rise in women who do not have the ability to produce enough insulin to adopt this resistance. High incidence of GDM in present study and similar study emphasize the importance of screening universally in all pregnant women. An early diagnosis is always better as it gives enough time to prevent and correctcomplications.Medical nutrition therapy give a very valuable effect on sugar profile and in control of diabetes mellitus.

Present study has shown the incidence of GDM of 9.4% in antenatal women. But with the global epidemic of diabetes mellitus involving specially our country,the trends will show a rise only.

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