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MALNUTRITION OF CHILDREN AMONG GESTATIONAL DIABETIC AND TYPE 2 DIABETIC MOTHER

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Abstract:

Type 2 diabetes is a multifactorial disease and its etiology involves a complex interplay between genetic, epigenetic and environmental factors. Data from human and animal studies have shown that malnutrition or over nutrition, metabolic disorder, exposure to hypoxia, some chemicals and hormones and unhealthy lifestyle. The present study is related to malnutrition of children among Type2 and Gestational diabetic mother. Results were discussed in briefly.

Key words: Diabetes, Gestational, Type2

Introduction:

In recent years, evidences from both human and animal experiments have correlated early life factors with programming diabetes risk in adult life. Fetal and neonatal period is crucial for organ development. Many maternal factors during pregnancy may increase the risk of diabetes of off springs in later life, which include malnutrition, healthy (hyperglycemia and obesity), behavior (smoking, drinking, and junk food diet), hormone administration, and even stress. In neonates, catch-up growth, lactation, glucocorticoids administration, and stress have all been found to increase the risk of insulin resistance or T2DM.

Type 2 diabetes (T2DM) is a metabolic disease caused by genetic and multiple environmental factors. Epidemical and experimental studies have found that detrimental early life factors may predispose high incidence of cardiovascular disease and metabolic diseases in later life, which is also termed as “barker hypothesis.”

The mechanisms responsible for the prenatal malnutrition programming insulin resistance or T2DM remain unclear. Orozco-Solís et al. have found that low protein diet during pregnancy and lactating may cause permanent altered hypothalamic expression of genes in rat offspring involved in insulin signaling and lipid and glucose metabolism, which may programme metabolic diseases.

Diabetes during pregnancy may be divided into clinical diabetes (women with previously diagnosed with type 1 or type 2 diabetes) and gestational diabetes. The American Diabetes Association defines gestational diabetes as “any degree of glucose intolerance with onset or first recognition during pregnancy”, but provides diagnostic thresholds for fasting and post-glucose loading values.

The offspring of women with diabetes during pregnancy is at higher risk of developing hypertension and other cardiovascular disease. The intrauterine environment represents a vicious cycle with the offspring being at risk of developing gestational diabetes or diabetes at a young age. More recently, it has been evocated that environmental signals can alter the epigenetic state of specific genes and modulate their activity.

The prenatal period is a key developmental window for nutrition status. Transfatty acids are unsaturated fatty acids that contain nonconjugated double bond in the trans-configuration. So far, data that correlated transfatty acids diet with insulin resistance or diabetes is weak and inconsistent. Data about long-term effects of prenatal junk food taking is quite limited; experiment from Bayol et al. has indicated that junk food taking during prenatal and lactating period may cause reduced insulin sensitivity in female offspring rats. More intensive studies still need to be performed for the convincing conclusion.

Studies have reported the unfavorable effects of smoking on diabetes in adult. However, a clearly causal relationship has only been found between maternal smoking and increased risk of T2DM in the offspring. A human study performed by Thiering et al. had found increased insulin levels in 10-year-old children after prenatal smoking, and breast milk feeding made this alteration even more magnificent.

It is already known that exposure to high levels of maternal stress hormones during pregnancy may produce detrimental effects on the offspring. The effect of prenatal stress in programming T2DM has been found in both human and animal studies. A retrospective study has shown that children exposed to stress caused by bereavement during their prenatal life had more risk to T2DM later in life.

Shankar et al. have found in mice that the male offspring with overweight mother may exhibit magnificent increase in body weight and adipose tissue content, which also combined with insulin resistance and increased levels of insulin, leptin, and resistin.

Exposure to elevated intrauterine glucose environment has been found to cause alterations in fetal growth patterns, which predispose these infants to developing obesity, insulin resistance, and diabetes later in life. So far the effects of intrauterine hyperglycemia on the offspring have been studied in human in pregnant mothers with T2DM or with gestational diabetes and in diabetic animal models mainly caused by streptozotocin treatment.

Lactation and insulin resistance. It has been found that both early weaning and overfeeding by more milk intake may lead to insulin resistance in later life. Maternal stress, obesity, hyperglycemia, and even smoking during lactation might also cause reduced insulin sensitivity in the offspring, which suggest that the breast milk can be the “agent,” transferring altered levels of hormones, insulin, or fatty acid contents from maternal circulation to neonate.

There are evidences indicated that exposure to some hormones during neonatal life may predispose metabolic disorders in adult life. Glucocorticoids treatment in neonatal rats caused increased fasting and postprandial blood glucose, which is combined with magnificent insulin resistance and lipid disorder in later life.

Socioeconomic status has a notable impact on health disparities, including type 2 diabetes risks. Low childhood socioeconomic status was found linked to type 2 diabetes in some studies and the association remained even after being adjusted for adult socioeconomic status and obesity. Poor nutrition, unhealthy behaviors, and limited access to material goods and limited socioeconomic opportunities may contribute to altered body composition in later life, which might explain the relationship between childhood socioeconomic position and metabolic disorders in adult.

Childhood obesity is an issue of serious medical and social concern. Many studies have demonstrated the positive correlations between childhood obesity and adult metabolic disorders, including type 2 diabetes.

There is increasing recognition that the risk of type 2 diabetes can be influenced by prenatal, neonatal, and childhood exposures. In the present studies, we have reviewed nutritional,

environmental, and physiological factors from prenatal to postnatal periods, which have been documented in studies that may correlate with insulin resistance or type 2 diabetes in adult life.

Objectives of the Present Study:

a. **To assess the Anxiety levels among the Gestational Diabetic mothers.**
b. **To assess the Worry among Gestational Diabetic mothers .**

Sample of present study:

• A sample of 120 community dwelling elderly women of rural and urban areas of Chittoor district from the age groups of 28-38 years were drawn by using a multi-stage sampling technique . The sample used as a part of HRD funded project.

Tools Used:

Beck's Anxiety Scale

Beck's anxiety Inventory (BAI) was used in the present study to measure manifested symptoms of anxiety. From the original Beck's anxiety Inventory (Beck, 1990), 20 items were selected on the basis of administration of Beck Anxiety Inventory in a pilot test. The test-retest reliability was found to be 0.87. The higher score on Beck Anxiety Inventory indicates higher levels of anxiety. This tool was standardized as part of ICSSR funded project on Fears, worry and anxiety in older residents (Jamuna, 2012).

Penn state Worry Scale

The PSW used in the present study was an adopted version of Meyer , Miller, Metzger, and Borkovec. (1990). The 16 items cover excessiveness, duration, uncontrollability and associate distress of worry as experienced by clients. Of the 16 items only 14 items were selected after content analysis. The higher score on PSWQ indicates higher levels of worry. The test retest reliability of PSWQ is found to be 0.79 .

Table: 1 Levels of Anxiety Among Gestational Diabetic Mothers Across Sociodemographic Subgroups

Sl.No.	Sub group	Mean (SD)	t value
1.	**Age**		
	a) 28-35	35.84(8.43)	2.594**
	b) 35-38	33.88(9.95)	
2.	**Locality**		
	a). Rural	35.06(9.18)	2.380**
	b). Urban	33.96(9.28)	
3.	**Educational Status**		
	a).No education	33.92(9.23)	2.045**
	b).Education	36.00(9.08)	
4.	**Income Status**		
	a.) Middle class	38.98(5.98)	1.964*
	b.) Upper middle	38.07(6.39)	
5.	**Type of family**		
	a). Nuclear	35.07(7.96)	7.041**
	b). Joint	31.89(10.05)	

Anxiety levels assessed through the Beck's Anxiety scale was reported in different socio demographic subgroups. The distribution of scores obtained on BAS ranged between 30 to 40. It is evident from Table – 1, that 28-35 and 35 – 38 differed significantly (t = 2.594); also 28-35 and 35 – 38 year mother (t = 2.380) has significant difference between rural and urban areas. In educational status subgroups no education group and education group differed significantly (t = 2.04). The mean differences between in joint families and nuclear families differed significantly (t = 7.041). thus, the mean trends on anxiety levels those who were in rural areas, those who had no education, those who are from lower middle class in one and live in Nuclear families reported higher levels of anxiety, which is alarming.

Table: 2 Mean Levels of Worry Among Gestational Diabetic Mothers in Different Sociodemographic Variables

Sl.No.	Sub group	Mean (SD)	't' value
1.	Age		
	a) 28-35 b) 35-38	31.94(9.08) 28.50(11.41)	3.202**
2.	**Locality**		
	a) Rural b) Urban	32.44(10.40) 29.97(13.01)	2.574**
3.	**Educational Status**		
	a) No education b) Education	28.52(9.61) 39.10(11.31)	4.063**
4.	**Income Status**		
	a) Middle class b) Upper middle	32.42 (10.56) 36.60 (10.45)	1.989*
7.	**Type of family**		
	a) Nuclear b) Joint	39.56 (11.13) 33.20 (10.40)	2.668**

Nextly an attempt was made to analyse the mean trends on the basis of scores obtained through Penn state worry Questionnaire. The mean socio demographic subgroup difficulties were reported in Table – 2. It is clear that mean age differences between (t = 3.20) 28-35 and 35-38 years differed significantly in PSW scores. The rural and urban area groups differed significantly (t = 2.57). There is significant difference between Nuclear and Joint family mothers (t = 2.66). It is evidently clear that there is difference between Middle class income group and Upper middle class group (t=1.98). The group of no education is differed significantly with the educated group (t=4.06). Thus, any interventions when worry levels are low would be more beneficial to promote / ensure mental well being during old age. If worry levels are allowed without any steps either by older adults (or) by their family members (or) by any other state supports, it would lead to pathological worry which may cause more financial, psychological and social burden on individual and their families.

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