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"Efficacy of *momordica charantia* (karela) in gestational diabetes"

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ABSTRACT

Gestational diabetes is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy (especially during their third trimester) caused due to impaired insulin receptors function. Gestational diabetes affects 3-10% of pregnancies. As with diabetes mellitus in pregnancy in general, babies born typically at increased risk of problems such as being large for gestational age, low blood sugar, and jaundice. If untreated, it can also cause seizures or stillbirth. Most women are able to manage their blood glucose levels with a modified diet and the introduction of moderate exercise, but some require antidiabetic drugs, & In Ayurvedic classics description of Momordica charantia (karela) has been mentioned as an antidiabetic drug. According to studies karela probably lowers blood sugar level by increasing the activity of enzymes that help in metabolism of glucose.

Keywords- Karela, Garbhini Prameha, Gestational Diabetes

Introduction-

Gestational diabetes defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy.GDM implies exaggerated physiological changes of glucose metabolism in pregnancy[1].

Gestational diabetes is a condition in which women without previously diagnosed diabetes exhibit high blood

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glucose levels during pregnancy (especially during their third trimester). Gestational diabetes is caused when insulin receptors do not function properly. This is likely due to pregnancy-related factors such as the presence of human placental lactogen that interferes with susceptible insulin receptors. This in turn causes inappropriately elevated blood sugar levels. **Gestational diabetes affects 3-10% of pregnancies**[6]. As with diabetes mellitus in pregnancy in general, babies born to mothers with untreated gestational diabetes are typically at increased risk of problems such as being large for gestational age, low blood sugar, and jaundice[17]. If untreated, it can also cause seizures or stillbirth[18]. Gestational diabetes is a treatable condition and women who have adequate control of glucose levels can effectively decrease these risks[15].

In classics, no direct reference for "***Garbhini prameha***", can co-relate to '***jaata pramehi***'-explained by chakrapani as-

"***Tatascha madhumehi madhumehino va jaata na sadhyatwam syat" i.e*** pregnant lady may suffer from Prameha. **(Ref.Ca. Chi. 6/57 chakrapani)**

"Karvellam cha ati tiktam agni diptikaram laghu ushna sheetam bhedakam cha swadu pachyam samiritam,Aruchim cha Kapha Vatam Raktadosham jwaram kramim,Pittam panducha kushtach nashayediti kirtitam,Brihduktam Karvellam katu tiktam cha dipakam,Avrishyam bhedakam swadu ruchyam ksaram laghu smritam,Avatallam pittaharam raktaruk panduroghata,Arochak kapham swasam vranam kasam krimimstatatha,Kostham kushtham jwarashchev Prameha adhman nashnam,kamalam nashyatyev gunastvnye tu purvavat" (Ni.Ra)[3]

I.e ***Karela*** has '***pramehagna'*** property[3].

In Cha. Chi. 6/18- "**Samshodhana**" anarha- should be treated with **Samshamana-**where tikta dravyas should be used[4].

Most women are able to manage their blood glucose levels with a modified diet and the introduction of moderate exercise, but some require antidiabetic drugs[14], & ***In***

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Ayurvedic classics description of Momordica charantia (karela) has been mentioned as an antidiabetic drug. According to studies karela probably lowers blood sugar level by increasing the activity of enzymes that help in metabolism of glucose[2].

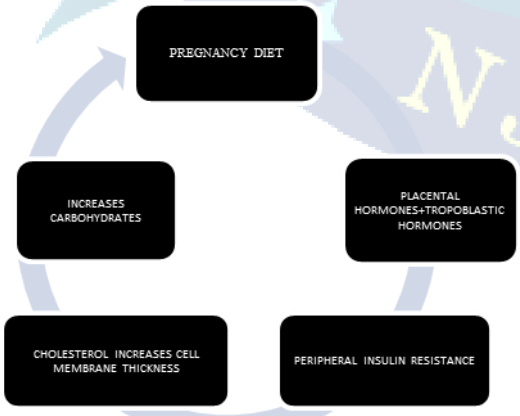
AIM:

- To evaluate the efficacy of Momordica charantia (***Karela***) in Gestational Diabetes.
- To study about *Garbhini Prameha* W.S.R Gestational Diabetes.

OBJECTIVES:

To decrease the blood glucose level in the mother so that there will reduction of Maternal and Fetal complications.

PATHOPHYSIOLOGY-



IN PREGNANCY THERE IS INCREASED REQUIREMENT OF CARBOHYDRATE DIET AND DUE TO THIS CHOLESTEROL LEVEL INCREASES AND THICKNESS OF CELL MEMBRANE, PARALLELY PLACENTAL HORMONE LIKE LACTOGEN OR TROPHOBLASTIC HORMONE INCREASES. ALL THESE CAN LEADS TO PERIPHERAL INSULIN RESISTANCE[8].

WHY GDM SHOULD BE TREATED?

1. **Maternal complications-**
   - During pregnancy- Abortion, Preterm labour in 20% cases[19], Infections like UTI, Pre-eclampsia in 25% cases, Polyhydramnios, Diabetic retinopathy, Diabetic nephropathy
   - During Labour- Prolongation of labour due to big baby. Perineal injuries, PPH
2. **Fetal complications-**Macrosomia, fetal death
3. **Neonatal complications-** Hypoglycaemia(<37mg/dl), Respiratory distress, Cardiomyopathy [9]

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TREATMENT MODALITIES-

- **INCLUSION CRITERIA:**
  - In 2nd trimester of pregnancy
  - Class A2 & class A1.
- **EXCLUSION CRITERIA:**
  - Overt diabetes.
- **DOSAGE:**
  - 40ml before meal in divided doses based on Agni Bala.

Here, both the classes i.e CLASS-A1, CLASS-A2 can be include[1]-

CLASS	ONSET	FASTING	2HR POST-PRANDIAL	THERAPY
A1	Gestational	<105mg/dl	<120mg/dl	Diet
A2	Gestational	>105mg/dl	>120mg/dl	Insulin

- If the fasting glucose level is 126mg/dl it is considered as Pregestational diabetes here excluding because there will be end organ dearrangement specially-eyes, kidney, heart which have significance effect on pregnancy outcome. So, the target is to reduce or come down to normalize GTT from late 2nd or 3rd trimester to delivery.

ACTION OF DRUG-

PROPERTIES: (Ref-Ni, Ra)

- ***Rasa*:** Katu, Tikta
- ***Guna*:** Laghu, Ruksha
- ***Virya*:** Ushna
- ***Karma*:** Kapha-Vataghna[20, 21, 23]
- ***Pramehagna*[22,]**

Karela is also known as balsam pear or bitter melon across the world. This medium-sized vegetable has a distinct bitter taste but is considered a very important inclusion in one's diet due to its amazing properties as a natural medication[13]. Karela is used as a natural drug all over South-East Asia. Karela commonly known as karvellaka is reputed one drug employed in the management of D.M[16]. The expressed juice of M.Charantia fruit administered

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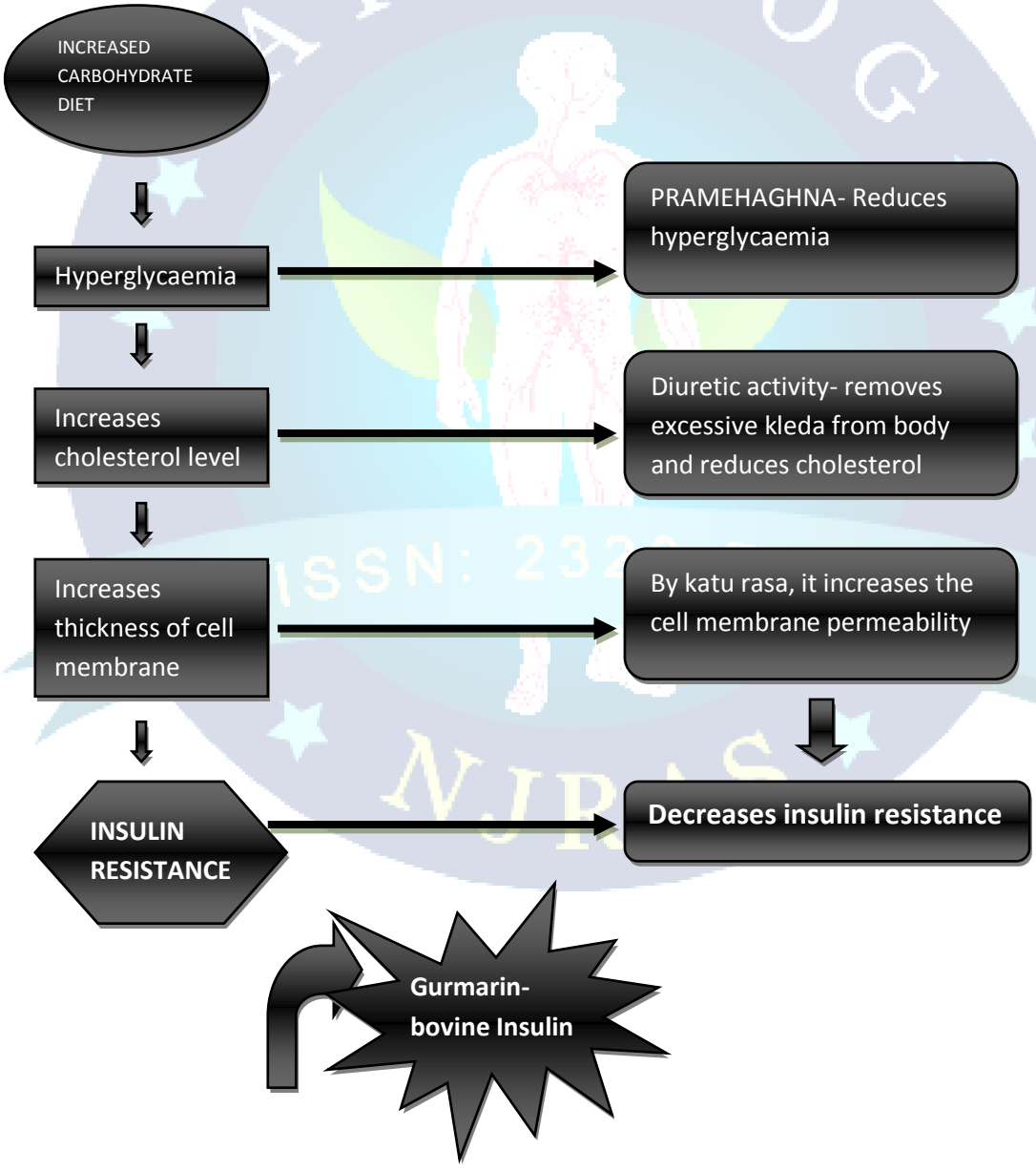
orally in different doses produced hypoglycaemia in normal and alloxan induced diabetic rabbits.

The effect of its juice in normal albino rats showed a significant reduction in blood sugar levels when G.T.T[2]. Similar reasons have been found in normal and alloxan diabetic dogs.

SAMPRAPTI VIGHATANA-



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ADVANTAGES OF EATING KARELA DURING PREGNANCY:

1. **High Folate Content:** Folate is a vital requirement for pregnant women. This mineral helps in keeping the new born safe from the possible neural tube defects. Karela contains a very high amount of Folate. It contains one quarter of the daily requirement of this mineral in pregnant women.

2. High Fiber Content: This vegetable is packed with fiber and it gives you a sense of satisfaction. It decreases food cravings for high-calorie food or junk food. This vegetable helps to remain slim even during pregnancy.

3. Anti-Diabetic*: Karela* has anti-diabetic properties. The nutrients like charantin and polypeptide-P help in fighting the gestational diabetes during pregnancy.

4. Anti-Oxidant: Karela contains vitamin C which is an antioxidant and helps the pregnant women fight against harmful bacteria. It also helps in building the immunity of the expecting mothers.

5. Regulates bowel Movement: This vegetable can also help in promoting peristalsis that later helps regulating the bowel movement and the digestive system of the pregnant women.

6. Great Source Of Nutrients Needed By The Foetus- Karela is a great source of some vitamins and minerals. It contains Iron, Niacin, potassium, pantothenic acid, zinc, pyridoxine, magnesium and manganese. It can easily be called a super vegetable as it plays a vital role in the growth of the foetus[16].

DISCUSSION-

Due to doshic imbalance during pregnancy – it should be maintained till delivery.

In ***madhumeha*** *madhuryata* in the body increases, *Madhura rasa (pruthvi+jala). Agni* of respective *mahabutas* is responsible to increase *madhuryata* in whole body .So; efforts should be made to improve ***jalagni*** and ***pruthviagni***[2].

Digests *ama dosha* --increases the physiological function of liver and

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amasaya—stimulates pancreas to secrete insulin[2].

In Astanga Hridaya[5] the term "***Madhuryashoga tanorath***" suggests presence of glucose in blood which circulates in whole body.

CONCLUSION-

Karela is cost-effective drug, easily available and acts effectively like insulin.

Garbhini should be treated like "**Pot filled with oil"**. Hence intensive care should be taken while prescribing any medicine to her.

Eating Karela over long period of time promotes normal glucose levels in the blood and urine.These include a mixture of steroidal saponins known as charantin, insulin-like peptides, and alkaloids. Karela contains Gurmarin, a polypeptide considered to be similar to bovine insulin, which has been shown in experimental studies to achieve a positive sugar regulating effect by suppressing the neural response to sweet taste stimuli[12].

Karela fruit is regularly used in the Indian diet & is rich in iron and has twice the beta carotene of broccoli, twice the calcium of spinach, twice the potassium of bananas, and contains vitamins C and B 1 to 3[11], phosphorus and good dietary fiber. It is believed to be good for the liver. At least 32 active constituents have been identified in *karela* so far, including beta-sitosterol-d-glucoside, citrulline, GABA, lutein, lycopene and zeaxanthin[7].

Nutritional analysis reveals that *karela* is also rich in potassium, calcium, iron, beta-carotene, and vitamins B1, B2, B3 and C[10].

So, here proper understanding of **antidiabetic** effect of ***karela*** on **gestational diabetes** is must & according to our classics as it is an antidiabetic drug practitioners can try this in gestational diabetes.

In this study effort is made to highlight the action of karela in gestational diabetes those who are in need of insulin therapy. So, further clinical trials can be conducted keeping this data as a base.

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