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GESTATIONAL DIABETES MELLITUS AND AYURVEDA …. A REVIEW

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ABSTRACT

Gestational diabetes mellitus (GDM), which is defined as a state of hyperglycaemia that is first recognized during pregnancy, is currently the most common medical complication in pregnancy. GDM affects about 4 million women in India. GDM can lead to potential risk for mother; foetus and child's development. Macrosomia (large for gestational age) is the complication of GDM. Excessive foetal growth, still birth may be induced during second and third trimester. Adopting the ayurveda protocol in pre-conceptional and antenatal care this aims that a woman enters pregnancy in healthy state of body and mind. While describing Garbhadhanvidhi acharyas have advised certain shodanameasures followed by special dietetics and mode of life for the couple. Following the garbhiniparicharya. The present study explores the ayurveda regime in management of GDM.

KEYWORDS: Gestational Diabetes Mellitus, Pregnancy, Garbini Paricharya, Garbhadhanvidhi.

INTRODUCTION

The definition of gestational diabetes mellitus (GDM) is any degree of glucose intolerance with onset or first recognition during pregnancy.[1] GDM it is currently the most common medical complication in pregnancy. Usually diagnosed in 24th to 28th weeks of pregnancy GDM affects about 4 million women in India.[2] The prevalence of GDM in the Indian population is high compared with other Asian countries. The GDM prevalence ranges from 6% to 9% in rural and 12% to 21% in the urban areas.[3] Mothers with GDM are at risk of

developing gestational hypertension, pre-eclampsia and termination of pregnancy via Caesarean section. Pregnancy is a particular time for all women. This condition becomes even more delicate when there is diagnosis of GDM which makes necessary controls and therapies that will inevitably affect the women's life. GDM can lead to potential risk for mother, foetus and child's development.

MATERIAL AND METHOD

Pathophysiology

The human placental lactogen is a hormone released by the placenta during the pregnancy. It holds a comparable composition to growth hormone and induces important metabolic changes during pregnancy to support the maintenance of fetal nutritional status. This hormone is capable of provoking alterations and modifications in the insulin receptors. The following molecular variations appear to have links to diminishing glucose uptake at peripheral tissues:

1. Molecular alteration of the beta-subunit insulin receptor,
2. Diminished phosphorylation of tyrosine kinase,
3. Remodeling's in the insulin receptor substrate-1 and phosphatidylinositol 3-kinase.

Maternal high glucose levels cross the placenta and produce fetal hyperglycemia. The fetal pancreas gets stimulated in response to the hyperglycemia. Insulin anabolic properties induce fetal tissues to growth at an increased rate.[4]

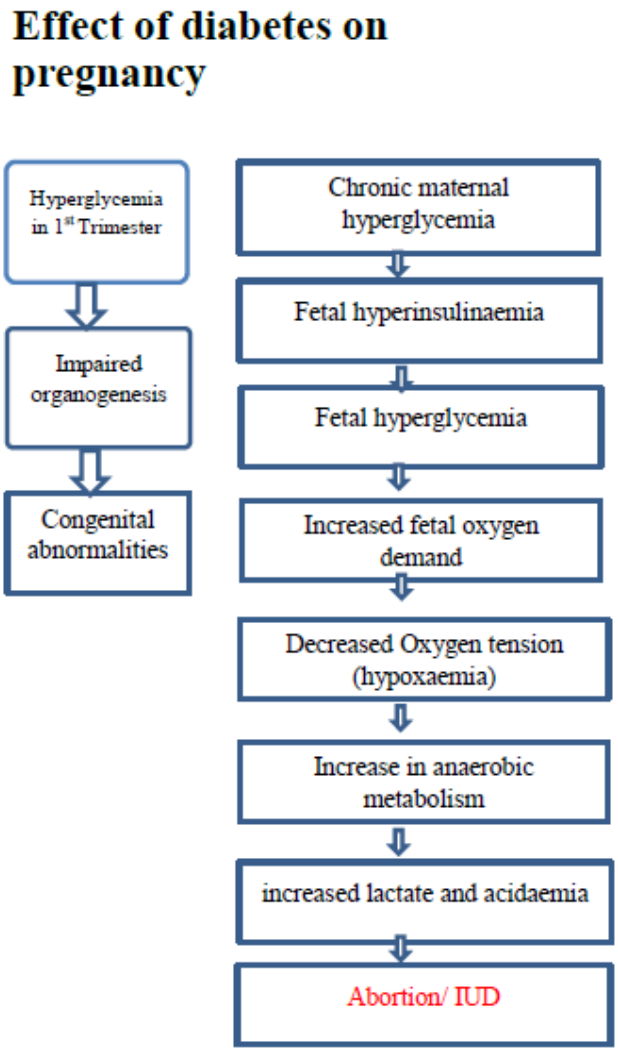
Concept of gestational diabetes in Ayurveda

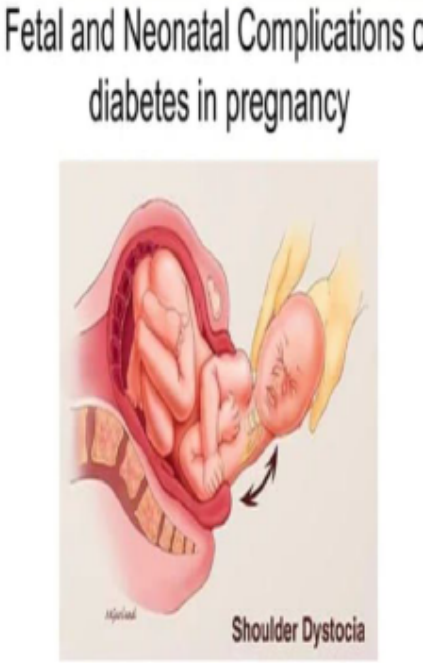
There is no direct reference of "Gestational Diabetes" in Ayurvedic texts, there are references of *Garbha Varidhi.*[5] *Garbha Varidhi* is a complication of Pregnancy described with women's abdomen rising more than usual for its gestation, big size of baby (macrosomia), difficult labor.[6] Maternal diet and nutrition has the prime importance in the fetal growth and development. Whatever diet the garbhini takes, convert into rakta dhatu produced from it indirectly forms the apara and from rasadhatu garbha nabhi nadi is formed.[7] If the garbhini take atimadhura and kapha prakopaka ahara without considering her agni and matra.[8] Along with these vihar like divaswapna causes agni dusti Ama Utpatti and there will be uttarottara dhatu dusti and medha dusti leads to prameha causes symptoms like prabhuta avila mutrata, kshua etc.

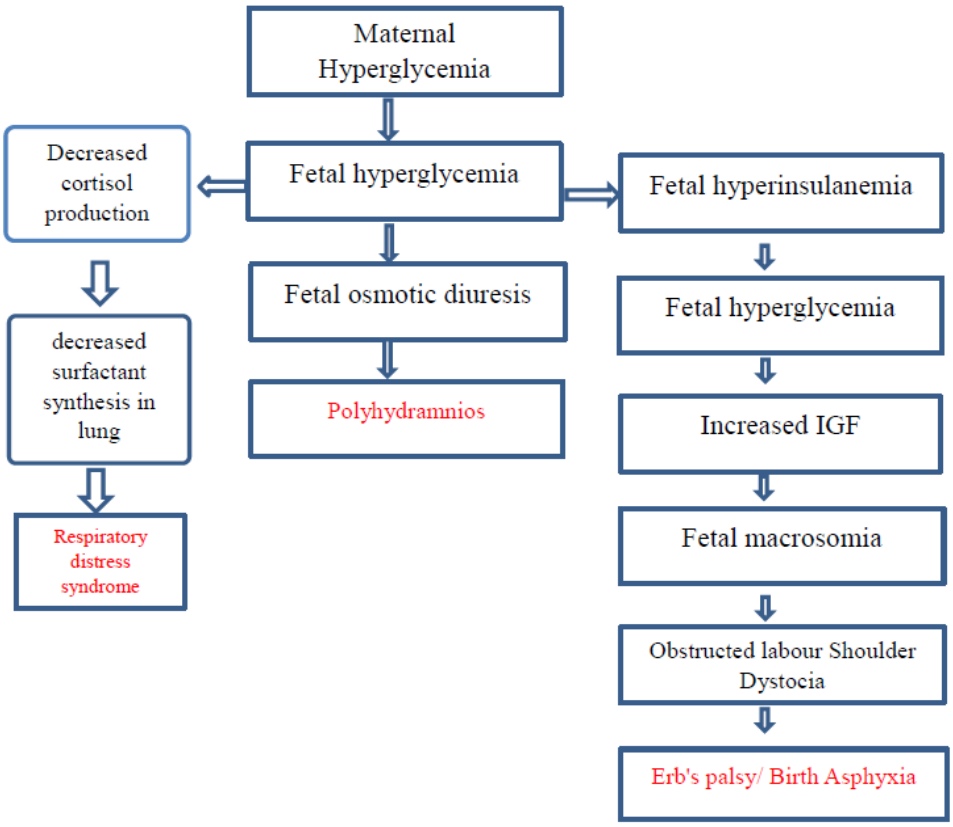
High Risk Factors of Gestational Diabetes

- Age of mother over 30 years
- History of Diabetes in her family
- Birth weight of previous delivered baby above 4 kgs
- Persistent glycosuria (outflow of sugar in urine)
- Obesity
- Smokers
- Pregnancy with Twin babies
- Stillbirth in previous delivery
- Unhealthy food practices
- Physically very inactive lifestyle

Effect of diabetes on pregnancy







Screening and diagnostic investigation

Indian context, screening 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. Recent data on the prevalence of GDM in our country was 16.5% by WHO criteria of 2 hr PG≥ 140mg/dl. As such universal screening has become important in our country. Gestational weeks at which screening is recommended: By following the usual recommendation for screening between 24 -28 weeks of gestation, the chance of detecting unrecognized type 2 diabetes before pregnancy(pre-GDM) is likely to be missed. So the recent concept is to screen for glucose in the first trimester itself as the fetal beta cells respond to maternal glycemic level as early as 16 weeks of gestation. So screening is done at 16 weeks, if negative repeated at 24-28 wks/ any time when symptoms and signs of hyperglycemia develop and at 32-34 wks. There is usually a two-step approach to diagnosing diabetes: The initial screening test is Oral Glucose Challenge Test (OGCT).[9]

Oral Glucose Challenge Test: Timings: 24-28 weeks gestation, Testing state: irrespective of fasting state, Dose of glucose: 75 gm dissolved in glass of water, Blood to be collected after 2hrs Threshold values: 140mg/dl.

Oral Glucose Tolerance Test: Done between 24-28 weeks of gestation if OGCT values>140mg%, testing state: overnight fasting of 8hrs, Dose of glucose: 75gm (WHO) dissolved in a glass of water, blood is collected in fasting state and at 2hrs after glucose Either of the values if abnormal, diagnose DM (FBS: ≥126mg% and 2hr PG≥ 140) Health risks of GDM.[9]

General management of GDM

The primary aim of GDM management is to optimize glucose control (FBS: 90-99 mg/dl and 2hr PPBS<120MG/dl) and improve pregnancy outcomes. The initial management of GDM involves diet modification and implementation of an exercise regime. Total calorie intake should be 30 kcal/kg/day (pre pregnant weight, non-obese). If BMI >27kg/m2 restrict calorie intake to 25k cal/kg/day. Carbohydrates 40-65%, Fat: 40%, proteins: 20% Moderate exercise (of at least 30 min daily). Aerobic activities-walking, stationary cycling at least 3 days/wk 20-45 min per session.[10] If adequate glucose control has not been achieved, the woman generally be prescribed anti-diabetic medications.

Management of GDM through Ayurveda

Preventive measures: Adopting preconceptional and thorough antenatal care through Ayurveda; this aims that a woman enters pregnancy in healthy state of body and mind. While describing garbhadhan vidhi acharyas have advised certain body purifying measures (samshodhana karma) followed by special dietetics and mode of life for the couple.[11] Again a special monthwise dietetic regime has been prescribed for the pregnant woman by following which the woman remains healthy and delivers the child possessing good health, energy, compactness.[12] Clinical studies have been conducted on this regime and have proved of great significance to mother and child both.

Ahara

Yava (Chenopodium album), Godhooma(pearl milletKodrava (Paspalum scrobiculatum). Mudga (Green gram), Thiktha shakas, Haridra (Curcuma longa), Methi (Trigonellafoenum-gracum), Nimba(Azadirachta indica), Karavella (Momordica charantia), Patola (Trichosanthas anguina), Rasona – Garlic, Udmbara (Ficus racemosa). Jambu (Syzygium cumini), Talaphala (Borassus flabellifer), Bilwa (Aegle marmelos).

Vihaara /Lifestyle Modifications for Gestational Diabetes As Per Ayurveda

- Ayurveda recommends a holistic and clean lifestyle for management of Gestational Diabetes.
- Healthy weight should be maintained at the time of conception. Overweight women are more at risk for developing gestational Diabetes. Now recent researches also prove that a BMI above 25 increase the risk of gestational diabetes.
- Regular yoga exercises like *Pranayamas* are beneficial.
- Be active but not hyper- active.
- Take regular oil massages and steam bath. They also help ease the tension in the muscles.
- Take sitz bath or shallow warm bath below waist in genital area often.

Aoushada chikitsa in GDM

Amalaki; its important constituents (including gallic acid, gallotanin, ellagic acid and corilagin), possess anti-diabetic effects through their antioxidant and free radical scavenging properties. Amla has also been reported to prevent/reduce hyperglycemia, cardiac complications, diabetic nephropathy.[13]

Guduchi; Tinospora cordifolia has anti-glycaemic properties, through which it can aid in lowering the blood sugar levels.

Bhumyamalaki(Phyllanthus niruri Linn) consists of many active constituents like phyllanthin, hypophyllanthin in leaves, estradiol in bark, root and ellagic acid, gallic acid as a whole plant. The drug has shown significant anti-diabetic activity, antiinflammatory, hepatoprotective activity.[14]

Ashwagandha; withanolides having the antidiabetic activity.[15]

Bilwa A methanolic extract of Aegle marmelos was found to antidiabetic activity.[16] It is now shown to prevent peak rise in blood sugar after 1 hr of food ingestion as documented after oral glucose tolerance test.

Nimba; Studies using *in vivo* diabetic murine model, *A. indica*, and *B. spectabilis* chloroform, methanolic, and aqueous extracts were investigated and results showed that *A. indica* chloroform extract and *B. spectabilis* aqueous, methanolic extracts showed a good oral glucose tolerance and significantly reduced the intestinal glucosidase activity.[17]

Kiratatikta; Traditionally, decoctions of this species are used for anthelmintic, hepatoprotective, hypoglycemic, antimalarial, antifungal, antibacterial, cardiostimulant, antifatigue, anti-inflammatory, antiaging, antidiarrheal, as protectant of the heart and also help in lowering blood pressure and blood sugar (Schimmer and Mauthner, 1996).

DISCUSSION

Acc to Kashyapa for Jwaradi Vyaadhis occurring in pregnancy, Sukshma Chikitsa has to be done with protection of the fetus and mainly Santarpana Chikitsa to be followed. The main principal treatment of Garbhini Paricharya explained in classics focuses on Santarpana in which Tridosha Shamaka Ahara, Vata Anulomaka and Kapha predominant Ahara such as Madhura Rasa, Ksheera, has been advised which are Prithvi Mahabhu predominant and helps in the growth of the Garbha. Garbhini should also consider her Agni status and consume food in proportionate quantity.[18] (acc to Desha and Kala).

Garbhini should be treated with utmost care, she has to be considered as the pot filled with oil and slight disturbance leads to spillage of the oil.[19] Similarly slight alteration in Ahara, Vihara and Aushadha leads to complications of pregnancy. Management of Gasbhaavstajanya Prameha should be done by proper assessment of Dosha, Dushya, Agni, Prakruti, Kala, Vaya. The risk group should be identified as prior as in Pre-Conceptional period and proper Garbhadhana Samskara should be provided as per classics[20]; this is helpful in preventing gestational diabetes mellitus. Later on, proper Garbhini Paricharya with Do's and Don'ts of the Garbhini should be followed. Prameha should be treated for pregnant and non-pregnant women on the same principles as explained in the classics. Careful management by protecting the Garbha and Garbhini treatment should be given.[21]

CONCLUSION

Adopting the ayurveda protocol in pre-conceptional and antenatal care this aims that a woman enters pregnancy in healthy state of body and mind Women with GDM have extra physiological challenges that when left unattended, have the potential to increase negative pregnancy outcomes for both mother and child. The holistic approach of treating Gestational Diabetes Mellitus with Ayurveda utilizing the concept given by Acharyas have shown good results in patients of GDM. By reviewing the available literature this can be concluded that gestational diabetes can be managed effectively on Ayurveda treatment principles (diet, yoga, herbs) which ensure healthy maternal and fetal outcome. There is a need for conducting clinical research in herbal drugs.

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