Gestational Diabetes in Early Pregnancy – what does fasting glucose tell us?

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Introduction: The association of fasting glucose levels in early pregnancy with adverse outcomes for the mother and her offspring is well established.[1] However, there is no consensus as to the most appropriate cutoffs for the diagnosis of Gestational Diabetes (GD).[2,3] Its relationship with the need for pharmacological treatment has been less studied.

Objective: Our goal was to evaluate the impact of fasting plasma glucose levels in the first trimester of pregnancy in the management of the pregnant woman and in obstetric and fetal outcomes.

Methods: A retrospective cohort of pregnant women with Gestational Diabetes diagnosed in the first trimester of pregnancy using the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria, attending Centro Hospitalar do Baixo Vouga, Portugal, who entered labor between January 2015 and June 2018 was performed. Twin pregnancies were excluded. The following variables were evaluated: maternal age, previous history and Body Mass Index, treatment, obstetric complications, prematurity, type of labor, newborn birth weight and neonatal morbidity. Fasting plasma glucose was stratified into 3 categories: category 1 – 92-94 mg/dL; category 2 – 95-99 mg/dL; category 3 – 100-125 mg/dL. Statistical analysis was performed using IBM® Statistical Package for the Social Sciences® v. 24.

Results: A total of 222 women were included, 15,3% of which had Gestational Diabetes in a previous pregnancy. Mean age at diagnosis was 33,0±5,5 years and mean fasting plasma glucose was 96,7±5,9 mg/dL (92-125). Of these, 47,3% (n=105) were treated with nutritional therapy alone, the remaining with both nutritional and pharmacological therapy – 18,0% (n=40) with oral antidiabetics, 27,9% (n=62) with insulin and 6,8% (n=15) with both. Preterm labor occurred in 8,1% of women (n=18) and cesarean delivery was performed in 32,0% (n=17). Within the offsprings, 11,3% (n=25) were large for gestational age and 16,7% (n=37) had neonatal morbidity – neonatal hypoglycemia, hyperbilirubinemia, neonatal respiratory distress syndrome and admission in Neonatal Intensive Care Unit. Maternal preconceptional Body Mass Index was positively correlated with fasting plasma glucose (r=0,192, p<0,05). No significant association was found between fasting glucose and adverse obstetric, fetal or neonatal

outcomes – gestational hypertension, preeclampsia, hydramnios, preterm labor, cesarean delivery, macrossomia or neonatal morbidity. Mean fasting plasma glucose was significantly higher in women with a history of gestational diabetes in a previous pregnancy (102,2±9,8 vs. 95,5±4,0 mg/dL, p<0,05), as well as in those who required pharmacological therapy (97,7±6,6 mg/dL vs 95,2±4,4 mg/dL under nutritional therapy, p<0,05).

		% (n)	Fasting glucose (mean±SD), mg/dL	p
History of GD	Yes	15,3% (34)	102,15±9,84	**< 0,05**
	No	84,7% (188)	95,54±3,98	
BMI class	Low weight	0,5% (1)	92,00	**< 0,05**
	Normal weight	41,4% (92)	96,00±5,07	
	Pre-obesity	27,0% (60)	94,88±3,53	
	Obesity	31,1% (69)	98,80±7,45	
Treatment	Nutritional	47,3% (105)	95,22±4,46	**< 0,05**
	Nutritional + pharmacological	52,7% (117)	97,74±6,56	
Arterial Hypertension	No	93,2% (207)	96,52±5,86	0,537
	Pregnancy	4,5% (10)	97,10±4,43	
	Previous	2,3% (5)	96,60±6,50	
Preeclampsia	No	96,4% (214)	96,55±5,86	0,677
	Yes	3,6% (4)	96,50±3,85	
Hydramnios	No	98,2% (218)	96,51±5,63	0,214
	Yes	1,8% (4)	98,50±13,0	
Pre-term labour	No	91,9% (204)	96,64±5,94	0,586
	Yes	8,1% (18)	95,56±3,61	
Cesarian labour	No	68,0% (151)	96,38±5,18	0,273
	Yes	32,0% (71)	96,90±6,95	
Weight category at birth	LGA	11,3% (25)	96,08±3,88	0,487
	AGA	86,5% (192)	96,59±6,02	
	SGA	2,2% (5)	97,20±5,35	
Macrossomy	No	97,7% (217)	96,53±5,81	0,148
	Yes	2,3% (5)	97,20±5,35	
Neonatal morbidity	No	83,3% (185)	96,34±5,51	0,543
	Yes	16,7% (37)	97,62±7,00	

Table 1. Comparison of mean fasting glucose using Mann-Whitney test. SD: standard deviation. GD: Gestational Diabetes. BM: Body Mass Index. LGA: large for gestational age. AGA: adequate for gestational age. SGA: small for gestational age.

When divided into categories, fasting plasma glucose was still significantly related with pharmacological therapy (needed in 45,5% of women in category 1, 51,6% in category 2 and 70,8% in category 3 (p<0,05)). Using logistic regression, fasting glucose didn´t have predictive power for the need of pharmacological therapy [p= 0,107, OR 1,107 (0,978 – 1,253)]. Pharmacotherapy was instituted at a mean gestational age of 19,67±6,99 (7-37) weeks, most of which (74,0%, n=87) was started from the 24th week of gestation.

Conclusion: Although many authors question the value of fasting plasma glucose in early pregnancy for the diagnosis of Gestational Diabetes, the majority of women in our

study needed pharmacological treatment. Among these, in 26% the pharmacotherapy was started before the 24th week of gestation – the timing for screening with an oral glucose tolerance test. The women who needed pharmacological therapy had higher fasting plasma glucose levels at diagnosis, but these didn't allow to predict the need for a pharmacological approach and didn't associate with worst obstetric or fetal outcomes.

This study confirms that early screening for gestational diabetes identifies pregnant women who need therapeutic intervention. Not applying such screening would result in the loss of the opportunity to timely treat these women, potencially impacting in a negative way both the mother and the newborn.

References:

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