ROLE OF FIRST TRIMESTER HBA1C AS A PREDICTOR OF ADVERSE OBSTETRIC OUTCOMES IN A MULTI-ETHNIC COHORT

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Background. Risk of obstetric complications increases linearly with rising maternal glycemia. Testing HbA1C is an effective option to detect hyperglycemia but its association with adverse pregnancy outcomes remains unclear. Emerging data sustains that an early HbA1c ≥5.9% could act as a pregnancy risk marker.

Aims. To determine, in a multi-ethnic cohort, the usefulness of a 5.9% first-trimester HbA1C threshold to identify women without diabetes at increased pregnancy risk.

Materials and methods. A prospective study was conducted between April 2013-September 2015. We included women over 18 years with a singleton pregnancy. All women had an HbA1c measurement added to their first antenatal bloods. Women diagnosed of unknown type 2 diabetes were referred to the Diabetes Unit while those with an HbA1c value < 6.5% did not undergo any additional testing until 24-28 weeks of gestation when they underwent routine gestational diabetes mellitus (GDM) screening using the two-step approach. **Primary outcome** was macrosomia. **Secondary outcomes** were pre-eclampsia, preterm birth and Caesarean section rate.

Results.

Figure 1. Flow chart of the study protocol

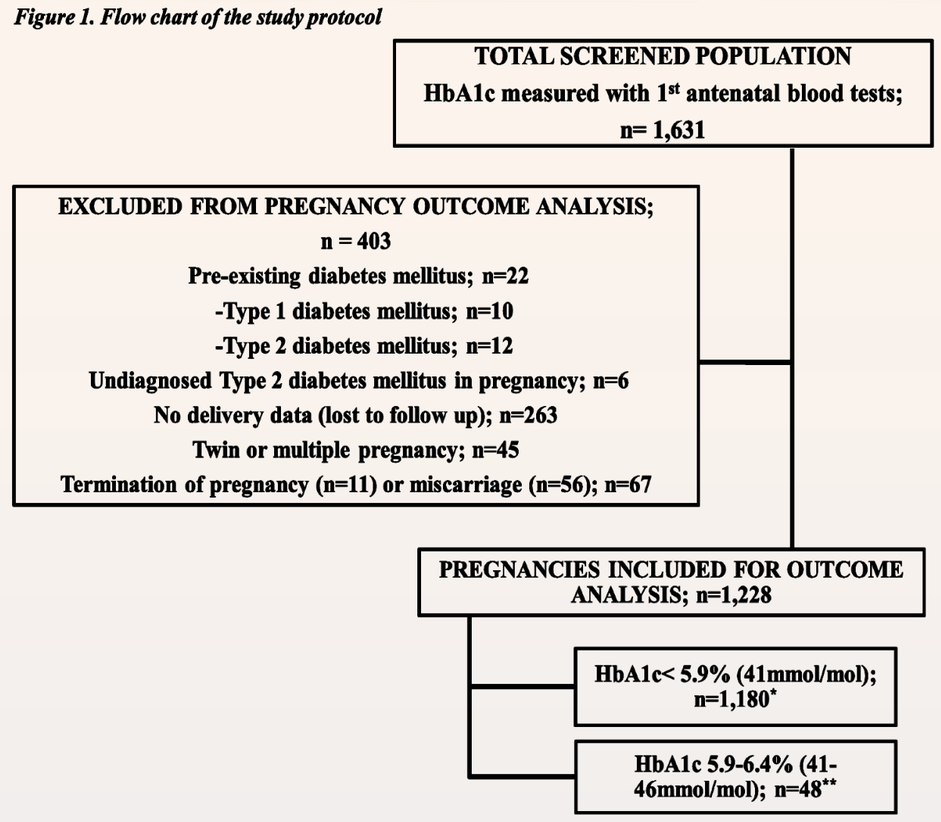


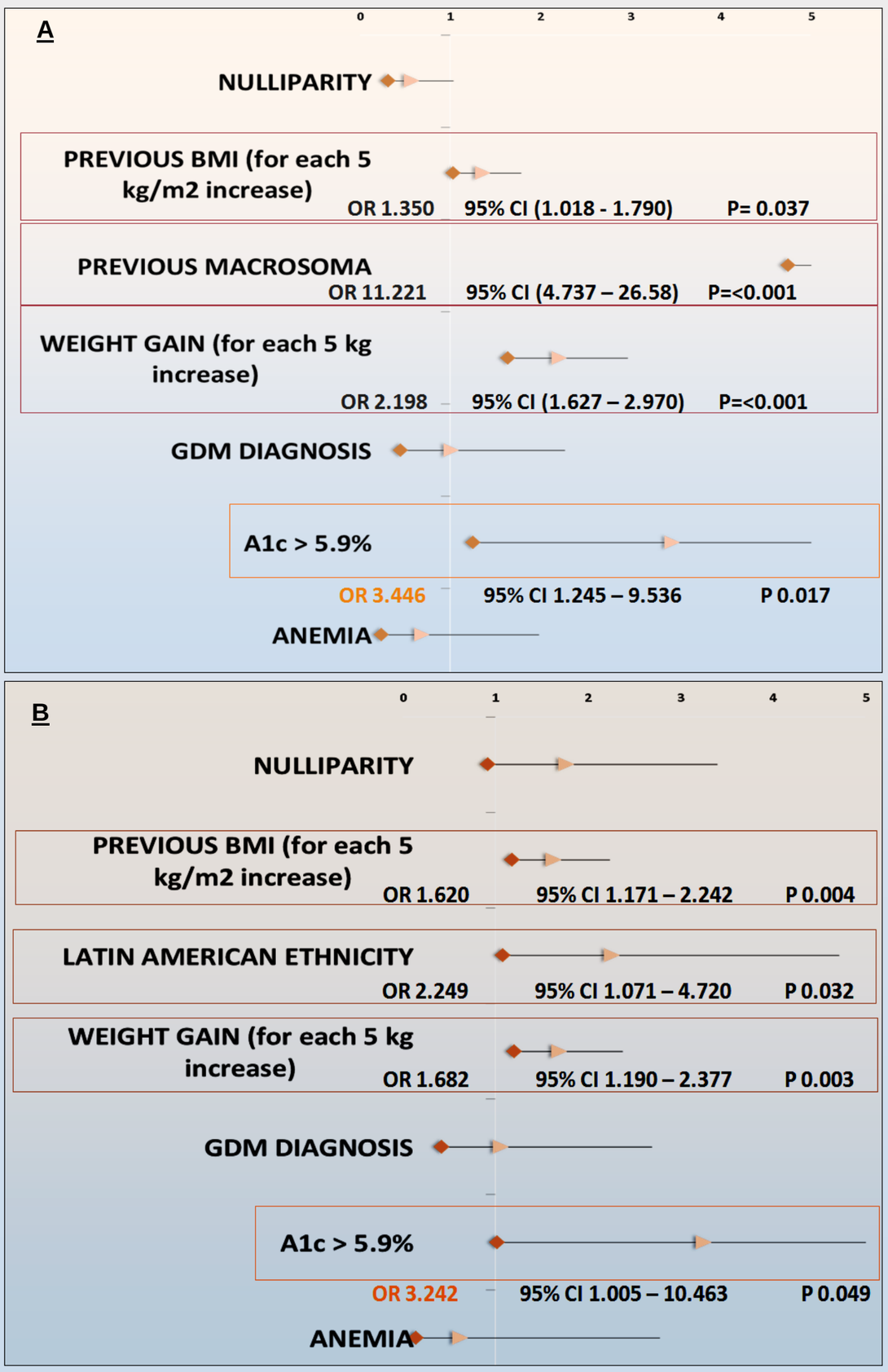
Table1. Maternal and gestational characteristics and pregnancy outcomes stratified according to HbA1c measurement at 1st antenatal blood testing.

	HbA1c < 5.9% n=1,180 n (%)	HbA1c 5.9-6.4% n=48 n (%)	P value
Maternal and gestational characteristics			
Age, years, mean ± SD	32.61 ± 5.69	33.70 ± 5.232	0.194
Pre-pregnancy BMI, Kg/m^2, mean ± SD	25.34 ± 5.04	28.10 ± 5.35	0.001
Previous macrosoma	32/1113 (2.9)	2/45 (4.4)	0.384
Multiparous	644/1170 (55)	33/48 (68.7)	0.075
GDM diagnosis	129/1109 (11.6)	22/47 (46.8)	<0.001
Ethnicity			
-Caucasian	614/1132 (54.2)	17/45 (37.8)	0.006
-South Central Asian	202/1132 (17.8)	18/45 (40.0)	
-Moroccan	81/1132 (7.2)	2/45 (4.4)	
-Latin American	155/1132 (13.7)	4/45 (8.9)	
-East Asian	63/1132 (5.6)	4/45 (8.9)	
-Other	17/1132 (1.5)	0	
Pregnancy weight gain, Kg, mean ± SD	10.886 ± 4.66	9.52 ± 5.11	0.055
Anemia	78 (6.6)	9 (18.8)	0.001
Microcytosis	136 (11.5)	16 (33.3)	<0.001
Pregnancy outcomes			
Preeclampsia	43/1115 (3.9)	4/43 (9.32)	0.092
Preterm birth	78/1155 (6.8)	5/47 (10.6)	0.369
Cesarean section	313/1169 (26.8)	14/47 (29.8)	0.312
Macrosomia	69/1171 (5.9)	8/48 (16.7)	0.008

Table2. Maternal and gestational characteristics and pregnancy outcomes among women with HbA1c ≥ 5.9% stratified according to GDM diagnosis.

	NO GDM (n=25)n (%)	GDM (n=22) n (%)	P value
Maternal and gestational characteristics			
Age, years, mean ± SD	33.54 ± 5.72	33.81 ± 4.87	0.865
Pre-pregnancy BMI, Kg/m^2, mean ± SD	26.20 ± 4.59	30.41 ± 5.46	0.008
Previous macrosoma	0	2/20 (10)	0.201
Multiparous	15/25 (60)	14/20 (70)	0.544
Ethnicity			
-Caucasian	12/24 (50)	4/20 (20)	0.020
-South-Central Asian	7/24 (29.9)	11/20 (55)	
-Moroccan	2/24 (8.3)	0	
-Latin American	3/24 (12.5)	1/20 (5)	
-East Asian	0	4/20 (20)	
Pregnancy weight gain, Kg, mean ± SD	11.33 ± 5.52	7.37 ± 3.63	0.007
Anemia	7 (28)	2 (9.1)	0.062
Microcytosis	10 (40)	6 (27.2)	0.358
Pregnancy outcomes			
Preeclampsia	3/24 (12.5)	1/18 (5.5)	0.623
Preterm birth	2/25 (8.0)	3/22 (13.6)	0.654
Cesarean section	8/25 (32.0)	5/21 (23.8)	0.822
Macrosomia	5/25 (20)	3/22 (13.6)	0.706

Fig2. Multivariate analysis of predictor factors for macrosomia (A) and preeclampsia (B).



Conclusions. In a multiethnic population, a cutoff point of HbA1c≥ 5.9% in early pregnancy identifies a group of women at high risk for poorer pregnancy outcomes independently of GDM diagnosis later in pregnancy. Further studies are required to establish cutoff points adapted to each ethnic group and to assess whether early detection and treatment are of benefit.