Are women positive for the One Step but negative for the Two Step screening tests for gestational diabetes at higher risk for adverse outcomes?

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ABSTRACT

- **Background:** Carbohydrates disorders in pregnancy, including gestational diabetes mellitus (GDM) are most common morbidities complicating pregnancy, with short- and long-term consequences to mothers, fetuses, and newborns. Worldwide controversy exists regarding the best method and criteria for GDM screening and diagnosis.
- **Objective:** To evaluate if women meeting criteria for GDM by IADPSG criteria but not by other less strict criteria have adverse pregnancy outcomes compared to GDM negative controls.
- **Data sources**: Electronic databases (i.e. MEDLINE, Scopus, ClinicalTrials.gov, EMBASE, Sciencedirect, the Cochrane Library at the CENTRAL Register of Controlled Trials, Scielo) were searched from their inception until January 2017.
- **Methods of study selection**: We included all studies identifying pregnant women negative at the Two Step test, but positive for IADPSG criteria. We excluded studies that randomized women to the One Step versus the Two Step tests; studies that compared different criteria within the same screening method; randomized studies comparing treatments for GDM; studies comparing mainly incidence of GDM in women doing the One Step test versus other women doing the Two Step test; and studies not reporting clinical outcomes.
- **Results:** All 8 included studies were retrospective cohort studies. We defined 5 study groups and 4 control groups and we compared outcomes in any study group to any control group. No one study evaluated if treatment of women IADPSG criteria positive but negative by other less strict criteria has an effect on adverse pregnancy outcomes. Macrosomia was more common in women positive on 75g IADPSG criteria but CDA-criteria negative, and positive on 75g IADPSG criteria but NICE criteria negative, while was less common in women positive for 100g IADPSG criteria, but negative on C&C criteria, compared to IADPS negative women. Other main outcomes were more common in study groups rather than in control groups.

CONCLUSIONS

Despite continuing controversy regarding if the One Step test or the Two Step tests should be used for GDM screening, we identified no study which evaluated if treatment of women meeting criteria for GDM by IADPSG criteria (One Step test) but not by other less strict criteria has an effect on adverse pregnancy outcomes compared to no treatment. More strict criteria for GDM screening could identify women at high risk and prevent adverse pregnancy outcomes.

GROUPS

5 study groups:
1) women 75g IADPSG-positive; 100g C&C-negative: no studies;
2) women 75g IADPSG-positive; WHO-negative: no studies;
3) women 75g IADPSG-positive; CDA-negative: 3 studies;
4) women 75g IADPSG-positive; NICE-negative: 1 study;
5) women 100g IADPSG-positive; C&C-negative: 4 studies;

4 control groups:
1) women GCT-negative;
2) women IADPSG-negative;
3) Women GCT-negative or IADPSG-negative
4) women WHO-negative.

RESULTS

Table 1: Outcomes between study group 3 (women 75g IADPSG-positive; CDA-negative) versus any controls.

Author (origin)	Macrosomia	Gestational hypertension	Pre-eclampsia	Hypertensive complications	Cesarean Delivery	NICU admission
Bodmer-Roy, 2012 (Canada)	20/186 (10.8%) vs 32/372 (8.6%)	8/186 (4.3%) vs 7/372 (1.9%)	12/186 (6.5%) vs 10/372 (2.7%)	NA	69/186 (37.1%) vs 94/372 (25.3%)	12/186 (6.5%) vs 20/372 (5.4%)
Mayo, 2015 (Canada)	19/155 (12.3%) vs 443/4709 (9.4%)	9/155 (5.8%) vs 105/4709 (2.2%)	4/155 (2.6%) vs 36/4709 (0.8%)	13/155 (8.4%) vs 140/4709 (3.0%)	57/155 (36.8%) vs 1247/4709 (26.5%)	11/155 (7.1%) vs 154/4709 (3.3%)
Tward, 2016 (Canada)	NA	NA	NA	14/99 (14.1%) vs 138/1205 (11.4%)	79/99 (79.8%) vs 839/1205 (69.6%)	89/198 (44.9%) vs 993/2410 (41.2%)
Total	39/341 (11.4%) vs 475/5081 (9.3%)	17/341 (5.0%) vs 112/5081 (2.2%)	16/341 (4.7%) vs 46/5081 (0.9%)	27/254 (10.6%) vs 278/5914 (4.7%)	205/440 (46.6%) vs 2180/6286 (34.7%)	112/539 (20.8%) vs 1167/7491 (15.6%)
OR (95% CI)	1.22 (0.86-1.72)	**2.26 (1.34-3.81)**	**5.18 (2.90-9.25)**	**2.26 (1.49-3.42)**	**1.34 (1.13-1.60)**	**1.33 (1.08-1.65)**

Table 2: Outcomes between study group 4 (women 75g IADPSG-positive; NICE-negative) versus any controls.

Author (origin)	Macrosomia	LGA
Meek, 2015 (UK)	112/387 (28.9%) vs 403/2406 (16.8%)	115/387 (29.7%) vs 406/2406 (16.9%)
Total	112/387 (28.9%) vs 403/2406 (16.8%)	115/387 (29.7%) vs 406/2406 (16.9%)
OR (95% CI)	**1.72 (1.37-2.19)**	**1.76 (1.40-2.22)**

Table 3: Outcomes between study group 5 (women 100g IADPSG-positive; C&C-negative) versus any controls.

Author (origin)	Macrosomia	LGA	SGA	Premature delivery	Pre-eclampsia	Cesarean Delivery	Neonatal hypo-glycemia
Lapolla, 2011 (Italy)	12/112 (10.8%) vs 145/1815 (8.0%)	20/112 (18.1%) vs 272/1815 (15.0%)	3/112 (2.8%) vs 58/1815 (3.2%)	NA	NA	49/112 (43.6%) vs 564/1815 (31.1%)	NA
Benhalima, 2013 (Belgium)	14/160 (8.5%) vs 577/6345 (9.1%)	17/160 (10.8%) vs 571/6345 (9.0%)	NA	47/160 (29.2%) vs 1643/6345 (25.9%)	1/160 (0.6%) vs 38/6345 (0.6%)	49/160 (30.5%) vs 1478/6345 (23.3%)	NA
Ethridge, 2014 (USA)	27/281 (9.6%) vs 371/7771 (5.0%)	56/281 (19.9%) vs 707/7771 (8.8%)	NA	NA	NA	82/281 (29.2%) vs 1818/7771 (23.4%)	NA
Liao, 2014 (China)	22/1314 (1.7%) vs 60/2666 (2.3%)	64/1314 (4.9%) vs 138/2666 (5.2%)	10/1314 (0.8%) vs 48/2666 (1.8%)	66/1314 (5.0%) vs 156/2666 (5.9%)	26/1314 (2.0%) vs 28/2666 (1.1%)	NA	18/1314 (0.7%) vs 18/2666 (0.7%)
Total	75/1867 (4.0%) vs 1153/18597 (6.2%)	157/1867 (8.4%) vs 1688/18597 (9.1%)	13/243 (5.3%) vs 106/4481 (2.4%)	113/1474 (7.7%) vs 1799/9011 (20.0%)	27/1474 (1.8%) vs 66/9011 (0.7%)	180/553 (32.5%) vs 3860/15931 (24.2%)	18/1314 (0.7%) vs 18/2666 (0.7%)
OR (95%CI)	**0.65 (0.51-0.82)**	0.93 (0.78-1.10)	**2.26 (1.25-4.08)**	**0.38 (0.32-0.47)**	**2.50 (1.59-3.93)**	**1.34 (1.13-1.59)**	**2.03 (1.05-3.91)**