Predicting intrapartum fetal compromise at term using the cerebroplacental ratio and placental growth factor (PROMISE) study: a randomised controlled trial

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Introduction

In some women placental function may not be adequate to meet fetal growth requirements in late pregnancy or the additional demands during labour predisposing these babies to intrapartum fetal compromise (IFC) and subsequent serious morbidity and mortality.

Objective

The objective of this study was to determine if the introduction of a pre-labour screening test at term for IFC combining the cerebroplacental ratio (CPR) and maternal placental growth factor (PlGF) level resulted in a reduction in a composite of adverse outcomes (CAO).

Methods

Single-site, non-blinded, RCT of a screening test performed between 37-38 weeks, combining the CPR and maternal PlGF. Eligible women were randomised to either receive the screening test or not. Screen positive women (CPR <20th centile & PlGF <33rd centile) were recommended induction of labour.

The **Primary CAO** was:
Emergency caesarean section for IFC or neonatal acidosis or 5-min Apgar score ≤5 or stillbirth.

Results

63/249 (25.3%) of the screened group compared to 56/252 (22.2%) of the control group experienced the primary CAO.

Relative Risk (RR) = 1.14 [95% CI 0.83 – 1.56]; p = 0.418

Within the screened group, those with a positive result were more likely to require operative delivery for IFC, have meconium liquor or CTG abnormalities and were smaller.
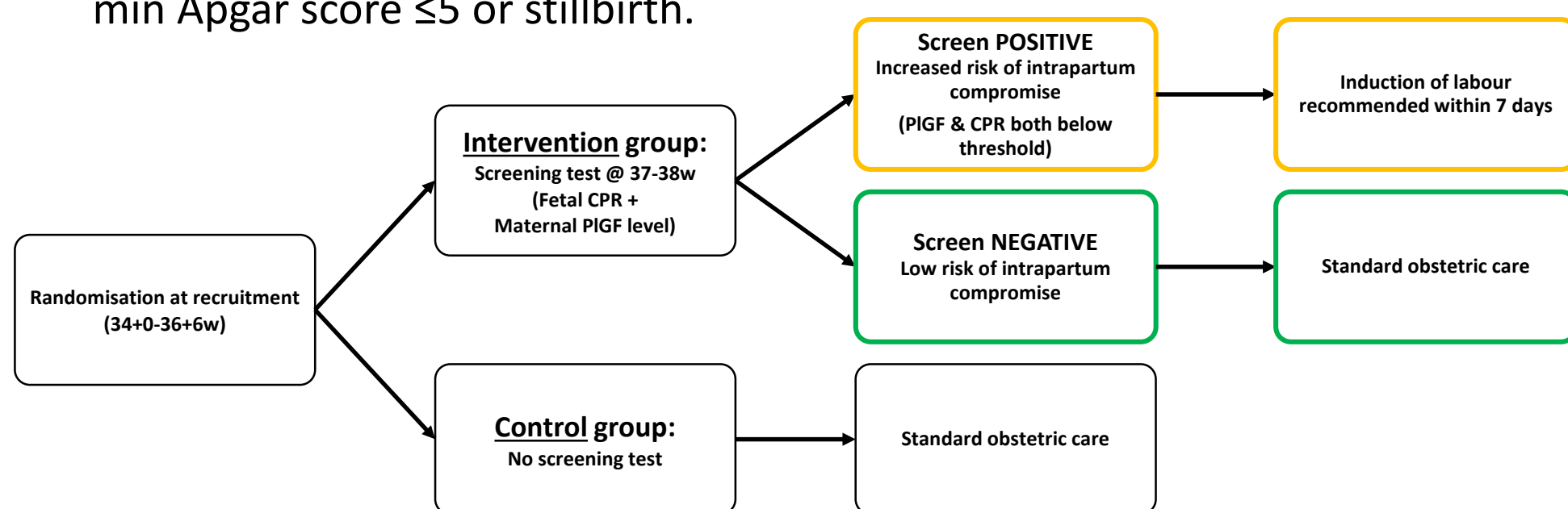

Conclusion

The introduction of this test at term did not result in a reduction of the pre-specified CAO. However, it did show discriminatory potential and future research should focus on refining the thresholds used.

Table 1. Analysis of primary CAO and individual components

Outcome	Overall (n=501)	Screening Test (n=249)	No Screening Test (n=252)	P-value
Primary CAO	119 (23.75%)	63 (25.3%)	56 (22.22%)	0.418[†]
Em CS for IFC	40 (7.98%)	19 (7.63%)	21 (8.33%)	0.772[†]
Neonatal acidosis*	80/338 (23.67%)	43/165 (26.06%)	37/173 (21.39%)	0.429[†]
Lactate >6	79/335 (23.58%)	42/163 (25.77%)	37/172 (21.51%)	0.359[†]
pH <7.1	11/338 (3.25%)	3/165 (1.82%)	8/173 (4.62%)	0.220[‡]
BE <-12mmol/L	3/334 (0.9%)	2/165 (1.21%)	1/169 (0.59%)	0.619[‡]
5min Apgar ≤5	4/495 (0.81%)	3/246 (1.22%)	1/249 (0.4%)	0.370[‡]
Stillbirth	2 (0.4%)	2 (0.8%)	0	0.248[‡]
Neonatal death	0	0	0	n/a

From arterial umbilical cord blood gas; [†] Chi-square test; [‡] Fisher's exact test

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