Biomarkers in GDM risk prediction

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Background

- Gestational Diabetes Mellitus
  - Up to 14 % of pregnancies
  - 30,000 p.a. nationally- 25% insulin treated
  - >100,000 hours of specialist consultations
- Multiple clinical risk prediction tools
  - best performing use similar criteria
  - best performing sensitivity of 68%; specificity 71%
- ?add serum biomarkers in GDM risk prediction

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Aims

- Aim: to explore relationships between serum biomarkers and GDM:
  - at hospital booking <20 weeks (T1)
  - 24-28 weeks gestation (T2)

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Methodology

- Cross-sectional, prospective sub-study of the TOBOGM Pilot Study
- Women at hi risk of GDM between 4-20/40
- OGTT-new ADIPS/IADPSG GDM criteria
  - <20/40 (T1)
  - 24-28/40 (T2)
- Fasting C-peptide, insulin, triglycerides, adiponectin, leptin and 3-betahydroxybutyrate

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Methodology-TOBOGM Pilot

- At T1, GDM women were randomized for immediate or deferred treatment
- Women randomised for immediate treatment did not have blood tests at T2

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Results – Prediction of early GDM (T1)

Early Marker	Odds ratio	p-value
Fasting plasma insulin	1.016 (1.007-1.026)	0.001
C-peptide	1.003 (1.001-1.005)	0.001
Betahydroxybutyrate	1.013 (1.003-1.023)	0.008
Leptin	1.025 (1.004-1.046)	0.015
Adiponectin	0.878 (0.781-0.986)	0.029
Triglycerides	1.427 (0.691-2.947)	0.336

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Prediction of 24-28/40 GDM (T2)

Early Marker	Odds ratio	p-value
Fasting plasma insulin	1.013 (1.003-1.024)	0.011
C-peptide	1.003 (1.001-1.006)	0.006
Betahydroxybutyrate	1.007 (0.996-1.019)	0.182
Leptin	1.017 (0.996-1.038)	0.111
Adiponectin	0.864 (0.766-0.975)	0.018
Triglycerides	2.118 (0.911-4.922)	0.081
logTriglycerides	5.837 (1.12-30.423)	0.036
logBetahydroxybutyrate	3.425 (1.068-10.985)	0.038

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Prediction of 24-28/40 GDM (T2)

Later Marker	Odds ratio	p-value
Fasting plasma insulin	1.007 (1-1.014)	0.038
C-peptide	1.002 (1-1.005)	0.016
Betahydroxybutyrate	1.015 (1.001-1.029)	0.036
Leptin	1.003 (0.983-1.023)	0.745
Adiponectin	0.943 (0.85-1.046)	0.269
Triglycerides	2.48 (1.099-5.598)	0.029

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Limitations

- Not fully reflective of the general population as at baseline all women were high risk for GDM
- The sample size is small
- The sample size is further reduced at T2 due to the study design

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Conclusion and significance

- Study suggests markers of insulin resistance and betahydroxybutyrate are related to GDM status at hospital booking and 24-28 weeks.
- Triglycerides are related to GDM status at 24-28 weeks
- These markers in combination with clinical parameters could produce a clinically usable risk prediction model