



LUND UNIVERSITY

A model for diabetes prediction five years after gestational diabetes

Ignell, Claes; Anderberg, Eva; Ekelund, Magnus; Berntorp, Kerstin

2015

Document Version:
Förlagets slutgiltiga version

[Link to publication](#)

Citation for published version (APA):

Ignell, C., Anderberg, E., Ekelund, M., & Berntorp, K. (2015). *A model for diabetes prediction five years after gestational diabetes*. Poster presenterad vid 8th International DIP Symposium on Diabetes, Hypertension, Metabolic Syndrome & Pregnancy, Berlin, Tyskland.

Total number of authors:
4

Creative Commons License:
Ospecificerad

General rights

Unless other specific re-use rights are stated the following general rights apply:
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117
221 00 Lund
+46 46-222 00 00



A model for diabetes prediction five years after gestational diabetes

LUND
UNIVERSITY

Ignell C, Anderberg E, Ekelund M, Berntorp K
Department of Clinical Sciences, Malmö, Lund University, Sweden

Conclusions

- BMI is an important and modifiable risk factor of diabetes after gestational diabetes (GDM).
- The prediction model rendered 86 % correct classifications of diabetes 5 years after GDM.
- As a concept to be used in counselling, a function sheet with a line diagram is proposed to illustrate the effects of weight on individual diabetes risk after GDM (Figure 2).

Introduction

Gestational diabetes mellitus (GDM) is a major risk factor for subsequent diabetes. A five-year follow up after GDM was performed to elucidate factors associated with diabetes and to explore the possibility of constructing a model for diabetes prediction postpartum.

Subjects and Methods

Five years after GDM a 75-g oral glucose tolerance test (OGTT) was performed in 362 women, excluding women already diagnosed with diabetes at a 1–2 year follow-up visit or later ($n=45$). All but 21 women had results from follow-up at 1–2 years, while 84 women were lost from that point. WHO criteria from 1999 were used.

Results

Five years after GDM, 28/362 (8 %) women were diagnosed with diabetes and 187/362 (52 %) had normal glucose tolerance (NGT). Among the latter, 139/187 (74 %) also had NGT at 1–2 year follow-up.

In univariate regression analysis, using NGT at 1–2 and 5 years as the reference, diabetes at 1–2 year follow-up or later ($n=73$) was clearly associated with easily assessable clinical variables, such as BMI at 1–2 year follow-up, OGTT 2-h glucose concentration during pregnancy and non-European ethnicity ($p<10^{-4}$), see Table 1.

A prediction model based on these variables resulted in 86 % correct classifications. The ROC curve with results are given in Figure 1.

Correspondence

Claes Ignell
Obstetrics and gynecology
Helsingborg Hospital
SE–251 87 Helsingborg
Sweden
Claes.Ignell@med.lu.se



Table 1

Results of univariate regression analysis of women with NGT at 1–2 and 5-years vs women diagnosed with diabetes at 1–2 year follow-up or later.

	R ²	OR (95% CI)	p
Non-European ethnicity (y/n)	0.21	7.09 (3.52-14.46)	<10 ⁻⁷
First grade DM heredity (y/n)	0.09	3.14 (1.69-5.84)	<0.001
Age at delivery (years)	0.06	1.10 (1.03-1.17)	0.005
Pregnancy			
Glucose (mmol/L), OGTT 2-h	0.16	1.91 (1.41-2.58)	<10 ⁻⁴
Diagnosis early gestation (y/n)	0.10	5.24 (2.10-13.10)	<0.001
Insulin treatment (y/n)	0.15	8.25 (3.30-20.64)	<10 ⁻⁵
1-2 years after pregnancy			
Deliveries >3 (y/n)	0.06	5.08 (1.69-15.29)	0.004
BMI (kg/m ²)	0.40	1.28 (1.19-1.37)	<10 ⁻¹⁰

CI, confidence interval; NGT, normal glucose tolerance; OR, odds ratio, R², pseudo R-square by Nagelkerke

Figure 1

ROC curve of the prediction model of diabetes 5 years after GDM.

Area under the curve was 0.91 (95 % confidence interval 0.86–0.95).

A calculated optimal cut-off of 36.4 % yielded a sensitivity of 82.1 % and a specificity of 88.0 % in this population.

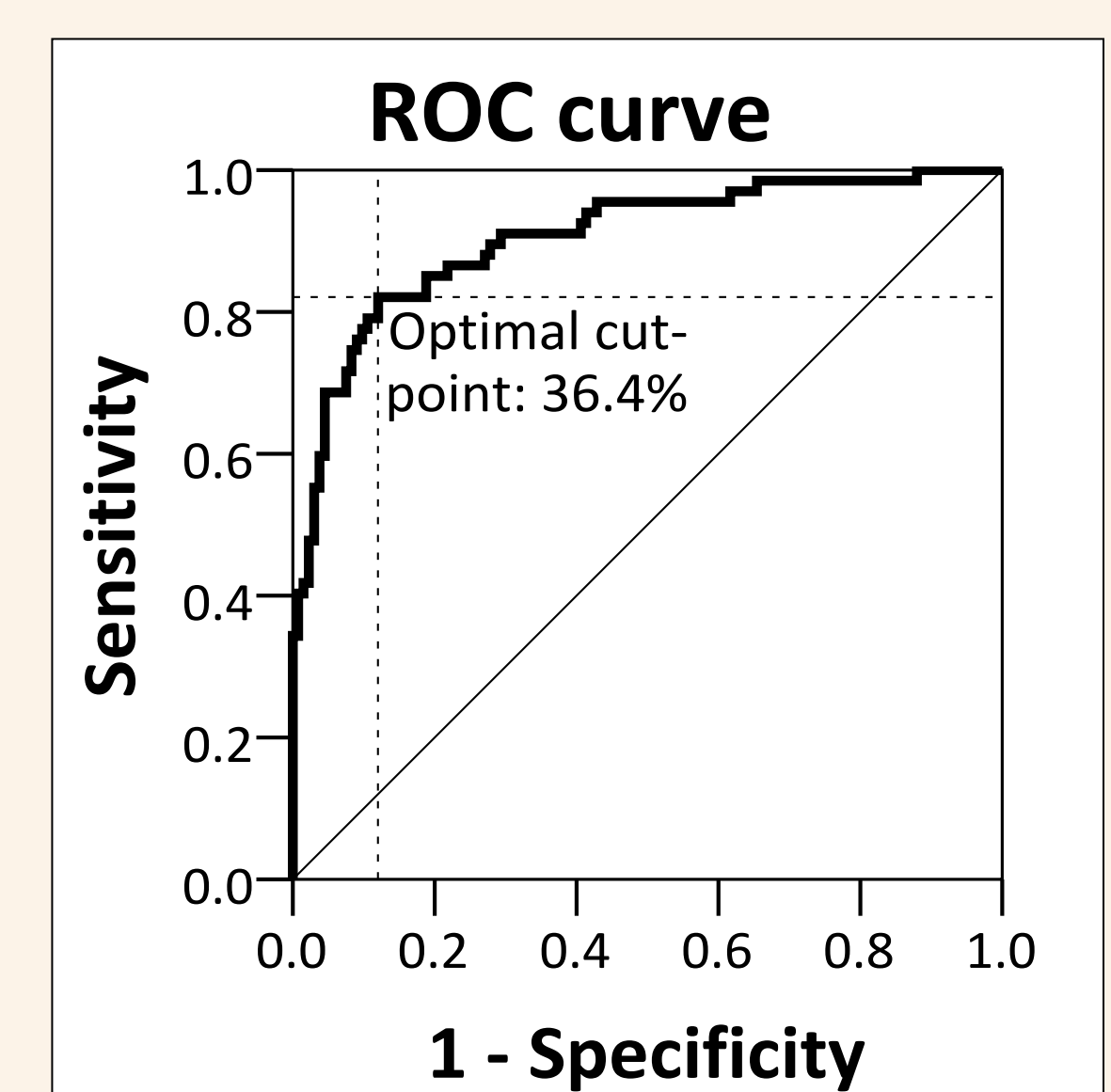


Figure 2

Individually predicted risk of diabetes 5 years after GDM versus weight of a European woman with a height of 1.75 meters, a OGTT 2-h plasma glucose concentration of 10 mmol/L in pregnancy, and a weight of 90 kg resulting in: 60 % risk of diabetes with a constant weight, declining to a 24 % risk with a weight loss of 20 kg.

To confirm understanding and enforce active engagement, an appeal of interaction with the diagram was added (brown).

