

High rate of progression to dysglycemia in a secondary prevention cohort over five years: Findings from the PRACTICE Registry

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BACKGROUND

- The prognosis in patients with coronary artery disease (CAD) is significantly worsened by concomitant diabetes or dysglycemia.
- The rate of glycemic deterioration among normoglycemic patients with stable CAD in contemporary practice is unclear.
- We obtained estimates of incident dysglycemia and predictors of transition to dysglycemia in the PRACTICE Registry, a cohort of stable CAD patients followed prospectively for 5 years.

METHODS

- The PRACTICE Registry enrolled 545 subjects with a history of CAD over a 1-year period.
- Inclusion Criteria:
 - ✓ Prior MI, PCI, CABG surgery or
 - ✓ Angiographic stenosis >50%
- Mean age 63 years, male 79%, body mass index (BMI) 27.3 kg/m², waist circumference (WC) 40.2 in..
- Proportion of subjects on evidence-based treatments: Aspirin 84%, ACEi or ARB 66%, Beta-blockers 64% and Statins 87%.
- Subjects were prospectively followed annually for 5 years at a single center in Brampton, Ontario, Canada.
- For this sub-study, we analyzed data from a sub-cohort of PRACTICE registry who either had normoglycemia or pre-diabetes at baseline.
- Pre-diabetes was defined as fasting glucose (FPG) = 110-125 mg/dl or HbA1c = 6.0-6.4%.
- Diabetes (DM) was defined as any of:
 - ✓ FPG ≥125 mg/dl
 - ✓ HbA1c ≥6.5%
 - ✓ Patient reported diagnosis of DM
 - ✓ Use of glucose-lowering medication

RESULTS

- Out of 545 subjects in PRACTICE registry, 267 (49.0%) subjects had normoglycemia and 64 (11.7%) had pre-diabetes at baseline. Baseline characteristics of this sub-group are presented in Table 1.
- Incidence of glycemic deterioration was the primary outcome, defined as the composite of pre-diabetes or DM among normoglycemic subjects at baseline, as well as progression to DM among subjects with pre-diabetes at baseline.
- The incidence of glycemic deterioration was 55.6% over 5 years (169/304) subjects with evaluable data).
- On univariate analysis, significant predictors for glycemic deterioration included baseline BMI, WC, waist-hip ratio, FPG, triglyceride and LDL levels.
- On multivariate Cox-proportional odds models (stepwise adjusting for baseline demographics and biochemistry), BMI, FPG and triglyceride levels were independently associated with glycemic deterioration (Table 2).

Table 1: Baseline characteristics of subjects with normoglycemia or pre-diabetes at baseline.

Baseline Characteristics	Patient Population of 331 patients in the cohort
Age	62.0
Gender (M)	271 (81.8%)
Vegetarian	30 (9.0%)
Hypertension	146(44.1%)
Hyperlipidemia	293(88.5%)
Smoking	31 (9.3%)
MI	240 (72.5%)
Angioplasty	138 (41.6%)
CABG	136(41.0%)
Stroke / TIA	17 (5.1%)
Family History of CVD	131 (39.5%)
Waist (in)	39.6
BMI (kg/m ²)	26.87
FPG (mg/dl)	97.0
A1c (%)	5.2
Triglycerides (mg/dl)	150
HDL (mg/dl)	47.7
LDL (mg/dl)	92.6

Table 2: Multivariate Cox-proportional odds model: BMI, Glucose, Triglyceride, HDL, and LDL.

Variables	Relative Risk	95% Confidence Int.	P-value
BMI	1.098	1.053, 1.145	<0.05
FPG	1.456	1.136, 1.866	<0.05
Triglycerides	1.268	1.054, 1.526	<0.05
HDL	1.773	0.986, 3.188	NS
LDL	1.096	0.994, 1.207	NS

DISCUSSION

- The rate of glycemic deterioration in contemporary stable CAD is unclear.
- In the POP-ABC study¹, which prospectively observed offspring of parents with type 2 diabetes for a mean follow-up of 2.6 years, incidental prediabetes or diabetes developed at a rate of approximately 11% per year.
- In a meta-analysis of prospective studies², the annual risk of progression to DM in people with impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) varied from 5 to 10%.

DISCUSSION

- The high rate of glycemic deterioration observed among patients with stable CAD in our study appears similar to that seen in previous studies with populations having known DM risk factors of pre-diabetes or a positive family history of DM.

SUMMARY AND CLINICAL IMPLICATIONS

- A high rate of glycemic deterioration was observed in this prospective secondary prevention cohort, despite annual reinforcement of optimal lifestyle behaviors and high use of evidence-based treatments.
- Baseline BMI, and levels of FPG and triglycerides were independently associated with glycemic deterioration.
- Intensive behavioural and risk factor modification should be emphasized in patients with stable CAD to reduce the development of pre-diabetes and diabetes.

REFERENCES

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CONFLICTS OF INTEREST

The authors report no conflicts of interest to the current study analyses.

SUPPORT

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