

Variability in traditional and novel cardiovascular risk factors by ethnic origin: Insight from the Primary cARe AuDIt of Global risk Management (PARADIGM) Study

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BACKGROUND

- The PARADIGM study is an observational registry, the primary objective of which is to evaluate primary care physician assessment of global cardiovascular (CV) risk in healthy individuals
- In 2009/2010, primary care physician investigators from 105 sites across Canada prospectively enrolled 3015 healthy middle-aged adults in PARADIGM to assess the prevalence of CV risk factors and trends in CV risk assessment using traditional biochemical and novel inflammatory and structural biomarkers of atherosclerosis
- Coronary heart disease is a primary public health concern both in North America and globally
- Several studies have demonstrated that persons of South Asian origin (those originating from the Indian sub-continent) are at heightened risk for type 2 diabetes and premature coronary heart disease (CHD) compared to white Caucasians (WC), whereas Chinese populations are at lower risk

METHODS

- The PARADIGM study enrolled 3015 generally healthy, middle-aged patients in an observational registry
- Subjects with diabetes or vascular disease were excluded, as were subjects receiving lipid-lowering therapy
- PARADIGM represents a pure primary prevention cohort
- The present analysis reports on the prevalence of various traditional and novel CHD risk factors in South Asians (SA), WC and Chinese subjects within this cohort

Inclusion Criteria

- Men ≥40y, women ≥50y
- Absence of known high Framingham Risk Score
- Absence of type 1 or type 2 diabetes
- Absence of lipid lowering treatment (current or past)
- No previous history of atherosclerosis (angina, TIA, myocardial infarction, stroke, peripheral arterial disease)
- Willingness to give informed consent

PARADIGM STUDY OBJECTIVES

- To evaluate primary care physician assessment of global cardiovascular risk in healthy individuals
- To determine the variability in traditional and novel cardiovascular risk factors by ethnic origin
- To evaluate the risk category of subjects of different ethnic groups based on the Total CV Framingham Risk Score

STUDY SETTING AND ENROLMENT

This analysis reports on 2615 PARADIGM subjects of various ethnic groups which includes SA (n=250, 8.3%), WC (n=2099, 69.6%) and Chinese subjects (n=266, 8.8%) in Canada

RESULTS

Table 1. Clinical variables: SA subjects compared to WC and Chinese Canadians

Variable (% (n) or mean ± SD ¹)	SA (n=250)	WC (n=2099) p-value : SA vs. WC	Chinese (n=266) p-value : SA vs. Chinese
Age	53.6y ± 8.7	57y ± 8.5 p<0.00001	56.3 ± 7.5 p<0.001
Male	70% (175)	61.5% (1291) p<0.05	41% (109) p<0.00001
Smoking Hx*(P/C)**	7.2% (18)	42% (882) p<0.00001	13.2% (35) p<0.05
Family Hx CVD***	29.3% (73)	27.2% (570) p=ns	10.5% (28) p<0.00001
Hypertension	30.4% (76)	29.5% (620) p=ns	24.4% (65) p=ns
IFG ²	40.3% (98)	34% (697) p=ns	30.2% (80) p<0.05
BMI****(kg/m ²)	28.5 ± 5.3	27.2 ± 4.4 p<0.0001	24.1 ± 3.6 p<0.00001
Waist circumference (Inches)	36.7 ± 3.9	38.3 ± 5.5 p<0.00001	33.4 ± 3.4 p<0.00001
Metabolic syndrome	37.6% (94)	30.1% (632) p<0.05	17.3% (46) p<0.00001

¹SD (standard deviation)
²IFG (impaired fasting glucose)
^{*}Hx(history)
^{**}P/C(past or current smoker)
^{***}CVD (cardiovascular disease)
^{****}BMI (body mass index)

RESULTS

Table 2. Lab results

Variable (% (n) or mean ± SD)	SA (n=250)	WC (n=2099) p-value : SA vs. WC	Chinese (n=266) p-value : SA vs. Chinese
LDL*(mg/dl)	139.0 ± 34.4	138.6 ± 32.2 p=ns	130.8 ± 31.4 p<0.05
TC**(mg/dl)	215.9 ± 40.5	219.1 ± 38.1 p=ns	212.6 ± 35.6 p=ns
HDL*** (mg/dl)	46.9 ± 11.6	53.4 ± 15.2 p<0.00001	58.3 ± 15.1 p<0.00001
TG**** (mg/dl)	160.1 ± 135.5	139.7 ± 90.6 p<0.05	122.9 ± 78.5 p<0.001
HbA1c	5.8%	5.7% p<0.01	5.7% p=ns
Fasting Glucose (mg/dl)	98.0 ± 12.5	96.9 ± 13.5 p=ns	96.2 ± 9.8 p=ns
hsCRP (mg/L)	3.2 ± 4.3	3.2 ± 5.1 p=ns	1.4 ± 2.7 p<0.00001

*LDL (low density lipoprotein)
**TC (total cholesterol)
***HDL (high density lipoprotein)
****TG (triglycerides)

Table 3. Categories of risk by total cardiovascular Framingham Risk Score

Variable % (n)	SA (n=250)	WC (n=2099) p-value : SA vs. WC	Chinese (n=266) p-value : SA vs. Chinese
Mean total CV FRS	12.1%	16.2% p<0.00001	9.7% p<0.01
Low FRS	57.4%(143)	36.9% (775) p<0.00001	63.9% (170) p<0.05
Intermediate FRS	26.1%	36.2% (759) p<0.00001	28.2% (75) p<0.05
High FRS	16.5%	26.9% (565) p<0.00001	7.9% (21) p<0.05

SUMMARY AND CLINICAL IMPLICATIONS

- Both traditional and novel CHD risk factors vary considerably across various ethnic groups
- Given that risk profiles differ by ethnic origin, CV risk stratification should take ethnic origin into account
- While FRS remains a well-validated risk score in WC populations, it may underestimate true CV risk in SA
- Novel risk factors, such as dysglycemia and metabolic syndrome, should be considered in risk stratification, particularly in visible minority groups

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