

Supplemental Data

Is self-rated health associated with cardiovascular risk factors and disease in a low-income setting? A cross-sectional study from the Amazon Basin of Brazil

Anna Engell Holm, MD; Laura Cordeiro Gomes; Alma Wegener, BSc; Karine O. Lima; Luan O. Matos; Isabelle V. M. Vieira; Molly D. Kaagaard; Manan Pareek, MD, PhD; Rodrigo Medeiros de Souza, PhD; Claudio Romero Farias Marinho, PhD; Tor Biering-Sørensen, MD, PhD, MPH; Odilson M. Silvestre, MD, PhD, MPH; Philip Brainin, MD, PhD, MBA

Content

| | |
|---|--------|
| Supplemental Methods: Echocardiography..... | page 2 |
| Supplemental Table 1: Sensitivity analysis without malaria patients..... | page 3 |
| Supplemental Table 2: Baseline clinical characteristics by sex..... | page 4 |
| Supplemental Figure 1: Sensitivity analysis without malaria patients..... | page 6 |

Supplemental Methods: Echocardiography

End-diastolic dimensions of the left ventricle were obtained in the parasternal long axis view and measured at the level of the mitral valve leaflets. Left ventricular mass was accordingly calculated by the Devereux formula. End-diastolic and end-systolic volumes of the left ventricle were obtained in the apical two-chamber and four-chamber projections, allowing assessment of the left ventricular ejection fraction by the Simpson's biplane method. Left atrial volumes were measured by the area-length method in the same views and later divided by the body surface area to yield the left atrial volume index. In the apical four-chamber view we assessed mitral inflow velocities of early (E) and late (A) diastolic filling with pulsed wave Doppler and the deceleration time of the E-wave was measured. Pulsed wave color tissue Doppler imaging samples were placed above the septal and lateral mitral annulus to measure early diastolic velocity (e') of the left ventricle. In a focused right ventricular view, we assessed tricuspid regurgitation (TR) velocity by continuous wave doppler imaging.

Supplemental Table 1.

Association between self-rated health (per 10-point increase), cardiovascular risk factors and disease in the study population excluding recently treated malaria patients (n=504).

| | Unadjusted odds ratio [95%CI] | P | Adjusted odds ratio [95%CI]* | P | P interaction sex |
|------------------------------------|----------------------------------|--------|---------------------------------|-------|-------------------------|
| Risk factors | | | | | |
| Hypertension | 0.76 [0.69 to 0.84] | <0.001 | 0.86 [0.77 to 0.96] | 0.007 | 0.005 |
| Hypercholesterolemia | 0.83 [0.75 to 0.92] | <0.001 | 0.90 [0.80 to 1.00] | 0.05 | 0.20 |
| Diabetes | 0.82 [0.71 to 0.95] | 0.009 | 0.98 [0.83 to 1.17] | 0.86 | 0.15 |
| Obesity | 0.91 [0.83 to 0.99] | 0.036 | 0.96 [0.87 to 1.06] | 0.40 | 0.36 |
| Smoking | 0.83 [0.76 to 0.91] | <0.001 | 0.93 [0.84 to 1.03] | 0.16 | 0.003 |
| Healthy diet | 1.19 [1.00 to 1.18] | 0.047 | 1.09 [1.00 to 1.19] | 0.049 | 0.012 |
| Physical activity | 1.12 [1.03 to 1.22] | 0.010 | 1.06 [0.96 to 1.17] | 0.22 | 0.001 |
| Subclinical cardiac disease | | | | | |
| LV ejection fraction <45% | 0.92 [0.73 to 1.16] | 0.49 | 1.02 [0.79 to 1.31] | 0.88 | 0.91 |
| LV hypertrophy | 0.92 [0.74 to 1.15] | 0.47 | 1.10 [0.84 to 1.44] | 0.48 | 0.33 |
| Diastolic dysfunction | 0.85 [0.68 to 1.08] | 0.18 | 1.05 [0.77 to 1.43] | 0.77 | 0.23 |

*Multivariable models were mutually adjusted for cardiovascular risk factors (hypertension, hypercholesterolemia, diabetes, obesity, smoking, healthy diet, physical activity) in addition to age, sex, work, family income, living area (rural/urban) and prior heart disease
LV: left ventricular

Supplemental Table 2. Baseline clinical characteristics by sex

| | Men n=224 | Women n=350 | P difference* |
|----------------------------------|-------------------|------------------|------------------|
| Baseline | | | |
| Age, years | 40 ± 15 | 42 ± 15 | 0.28 |
| Race, % | | | 0.41 |
| White | 33 (15%) | 44 (13%) | |
| Mixed | 153 (68%) | 262 (75%) | |
| Black | 36 (16%) | 40 (11%) | |
| Indigenous | 1 (<1%) | 3 (1%) | |
| BMI, kg/m ² | 26 ± 4 | 28 ± 5 | 0.001 |
| Abdominal circumference, cm | 87 ± 13 | 88 ± 13 | 0.45 |
| Asthma | 4 (2%) | 17 (4%) | 0.06 |
| COPD, % | 2 (1%) | 5 (1%) | 0.57 |
| History of MI, % | 2 (1%) | 3 (1%) | 0.96 |
| Heart failure, % | 3 (1%) | 2 (1%) | 0.33 |
| Rheumatic heart disease, % | 8 (4%) | 10 (3%) | 0.18 |
| SBP, mmHg | 133 ± 16 | 131 ± 22 | 0.18 |
| DBP, mmHg | 82 ± 12 | 82 ± 12 | 0.73 |
| Risk factors | | | |
| Hypertension, % | 37 (17%) | 75 (21%) | 0.15 |
| Hypercholesterolemia, % | 26 (12%) | 63 (18%) | 0.039 |
| Diabetes, % | 9 (4%) | 24 (7%) | 0.15 |
| Obesity, % | 31 (14%) | 102 (29%) | 0.001 |
| Smoking, % | 98 (44%) | 119 (34%) | 0.019 |
| Healthy diet, % | 99 (44%) | 177 (51%) | 0.14 |
| Physical activity, % | 107 (48%) | 104 (30%) | 0.001 |
| Socioeconomic status | | | |
| Work status, % | | | 0.001 |
| Employed | 70 (31%) | 224 (64%) | |
| Self-employed | 125 (56%) | 103 (29%) | |
| Other | 29 (13%) | 23 (7%) | |
| Family income, BRL | 1700 [1000, 2750] | 1200 [800, 2000] | 0.001 |
| Rural living area, % | 99 (44%) | 126 (36%) | 0.050 |
| Biochemistry | | | |
| Blood sugar, mg/dL | 100 ± 24 | 110 ± 67 | 0.047 |
| Bilirubin, mg/dL | 0.4 [0.3, 0.6] | 0.3 [0.2, 0.4] | <0.001 |
| Platelets, x 10 ⁹ /L | 220 ± 81 | 244 ± 62 | 0.001 |
| Leukocytes, x 10 ⁹ /L | 6.04 ± 1.59 | 6.63 ± 2.00 | 0.001 |
| Reticulocytes, % | 0.75 ± 0.19 | 0.80 ± 0.22 | 0.44 |
| Hemoglobin, g/L | 152 ± 11 | 134 ± 10 | 0.001 |
| C-reactive protein, mg/L | 0 [0, 0] | 0 [0, 0] | 0.59 |
| Creatinine, mg/dL | 1.0 ± 0.3 | 0.8 ± 0.2 | <0.001 |
| INR | 1.03 ± 0.09 | 1.00 ± 0.11 | 0.001 |
| Echocardiography | | | |
| LV ejection fraction <45%, % | 11 (4.9%) | 7 (2.0%) | 0.05 |
| LV hypertrophy, % | 6 (2.7%) | 11 (3.1%) | 0.75 |
| Diastolic dysfunction, % | 3 (1.3%) | 13 (3.7%) | 0.09 |

COPD: chronic obstructive pulmonary disease, MI: myocardial infarction, SBP: systolic blood pressure, DBP: diastolic blood pressure, BMI: body mass index, INR: international normalized ratio, LV: left ventricular

*P difference was calculated using the chi-square test, Student's *t*-test, and the Wilcoxon rank-sum test.

Normally distributed variables are displayed as mean \pm standard deviation.

Non-normally distributed variables are presented as median [interquartile range].

Proportions are displayed as n (%).

Supplemental Figure 1. Forest plot

Association between self-rated health (per 10-point increase) and cardiovascular risk factors stratified by sex. * indicates that the association remained significant in multivariable models.

