

ORAL PRESENTATION

Open Access

# Cardiovascular risk assessment in persons with HIV in the developing world: comparing three risk equations in a cohort of HIV-infected Thais

N Edwards-Jackson<sup>1\*</sup>, SJ Kerr<sup>2</sup>, HV Tieu<sup>1</sup>, J Ananworanich<sup>3</sup>, SM Hammer<sup>1</sup>, K Ruxrungtham<sup>2</sup>, P Phanuphak<sup>2</sup>, A Avihingsanon<sup>2</sup>

From Tenth International Congress on Drug Therapy in HIV Infection  
Glasgow, UK. 7-11 November 2010

## Purpose

There are growing concerns of cardiovascular disease in HIV-infected individuals and in developing countries, such as Thailand. We described the ten-year risk of coronary heart disease (CHD) in a Thai HIV-infected cohort using 3 cardiovascular risk equations, and assessed the level of agreement between their predictions.

## Methods

Cross-sectional analysis of data from 785 Thai subjects followed prospectively in the HIV Netherlands Australia Thailand Collaboration (HIV-NAT) cohort study from 1996-2009. Cardiovascular risk factor history, along with relevant laboratory and clinical data, was collected at follow-up clinic visits. Ten-year risks of CHD were calculated using the Framingham, Ramathibodi-Electricity Generating Authority of Thailand (Rama-EGAT), and Data-collection on Adverse Effects of Anti-HIV Drugs (D:A:D) risk equations.

## Results

Mean age was 41.0 years; 55% of subjects were male. Mean CD4 count was 569 cells/mm<sup>3</sup> after a mean of 7.7 years on anti-retroviral therapy. The prevalence of cardiovascular risk factors was low, with the most common risk factor being low high density lipoprotein (36.3%). The prevalence of high cardiovascular risk scores (defined as ten-year risk of CHD  $\geq 10\%$ ) was also low: 9.9%, 2.1%, and 0.8%, by the Framingham, Rama-EGAT, and D:A:D scoring systems, respectively. Only 8

subjects (1.0%) had a history of CHD. Bland-Altman plots revealed that the Framingham risk score was, on average, 1.4% (S.D. 3.9%) higher than the Rama-EGAT and 1.5% (S.D. 3.7%) higher than the D:A:D (Figure 1a, b). The limits of the difference showed that the Framingham could be as high as 9.1% above or as low as 6.4% below the Rama-EGAT, and as high as 8.9% above or as low as 5.9% below the D:A:D. The Bland-Altman plot comparing the D:A:D and Rama-EGAT equations (Figure 1c) demonstrated a smaller average difference (-0.16%) and narrower limits of the difference (-3.9% and 3.5%). All differences were most pronounced for subjects with higher average risk scores.

## Conclusions

The predicted cardiovascular risk in this HIV-infected Thai cohort was relatively low. The Framingham equation predicted the highest cardiovascular risks, which is consistent with its known tendency to over-predict risk in Thais. The agreement between the Rama-EGAT and D:A:D risk scores suggests that both equations may be appropriate estimators of cardiovascular risk in this and other developing world populations with low background risk.

## Author details

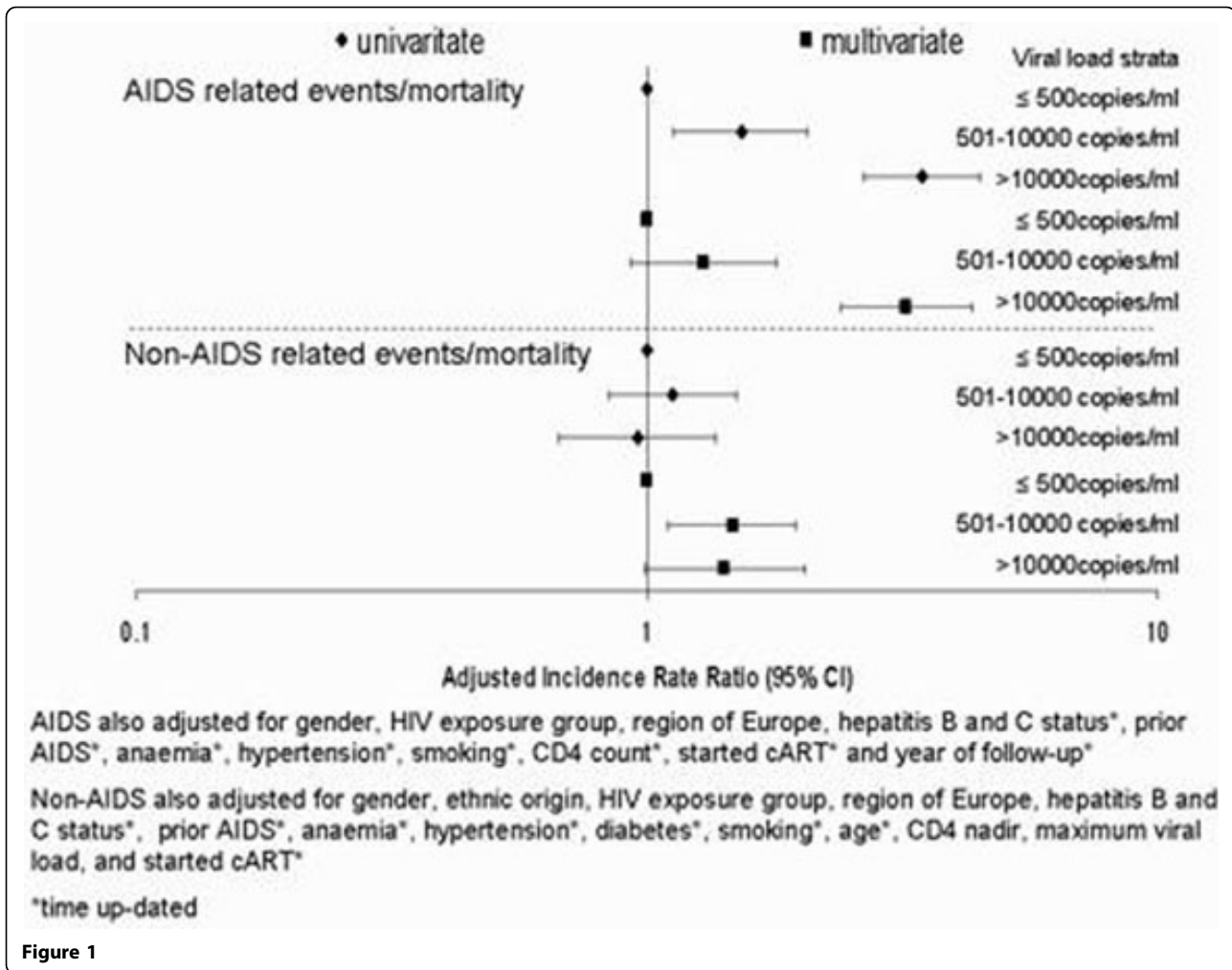
<sup>1</sup>Columbia University College of Physicians & Surgeons, New York, USA. <sup>2</sup>The HIV Netherlands Australia Thailand Research Collaboration, The Thai Red Cross AIDS Research Center, Bangkok, Thailand. <sup>3</sup>South East Asia Research Collaboration with Hawaii, Bangkok, Thailand, Bangkok, Thailand.

Published: 8 November 2010

## References

1. Expert Panel of Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults: **Executive Summary of the Third Report of the**

<sup>1</sup>Columbia University College of Physicians & Surgeons, New York, USA  
Full list of author information is available at the end of the article



National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). *JAMA* 2001, **285**(19):2486-2497.

2. Yamwong S: Final report. The development of coronary heart disease assessment [technical report on the Internet]. Bangkok (Thailand): National Health Foundation (ThainHF) 2005, Dec [cited 2009 Oct 9]. 17 p. Contract No.: PDG4830206. Available from: <http://hrn.thainhf.org/index.php?module=research&view=detail&act=ok&rid=67> using login name and password. Thai.
3. Fris-Møller N, Thiébaud R, Reiss P, Weber R, D'Arminio Monforte A, De Wit S, *et al*: Predicting the risk of cardiovascular disease in HIV-infected patients; the Data-collection on Adverse Effects of Anti-HIV Drugs (D:A:D) Study. *Eur J Cardiovasc Prev Rehabil* .

doi:10.1186/1758-2652-13-S4-O40

**Cite this article as:** Edwards-Jackson *et al.*: Cardiovascular risk assessment in persons with HIV in the developing world: comparing three risk equations in a cohort of HIV-infected Thais. *Journal of the International AIDS Society* 2010 **13**(Suppl 4):O40.

**Submit your next manuscript to BioMed Central and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)

