

The emerging role of CT coronary calcium scoring in identifying patients of high cardiovascular risk in the HIV population

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Introduction

- HIV is an independent risk factor for cardiovascular disease (CVD), an important cause of mortality and morbidity in an ageing HIV population.
- Current BHIVA guidelines recommend annual cardiovascular risk assessment. Since 2010, NICE recommend CT calcium scoring (CTCS) as a first-line diagnostic investigation and risk assessment tool in non-HIV patients. [1]
- CTCS quantifies coronary artery calcium (CAC); a direct in-vivo marker for atherosclerosis and correlate of future CVD events. [2]
- The prospective Multi-Ethnic Study of Atherosclerosis cohort of 6814 participants demonstrated a total CAC of >400 was associated with 'high risk' of future CVD events [hazard ratio of 20.6]. [3]
- We investigated the role of CT coronary calcium scoring in identifying patient's of high cardiovascular risk, with a view to better guide the emerging use of this new technology in the HIV population.

Method

- We retrospectively analysed a database of 280 non selected HIV seropositive patients from the Chelsea and Westminster cohort who had been referred for CTCS over a 2 year period.
- Participants were analysed according to age and gender.
- Participants were stratified into extremes of CVD risk: 'high risk' (CAC>400), 'non-high risk' (CAC 1-399) and 'lowest risk' (CAC=0, total absence of coronary calcium)
- The paired t-test was used to assess significance of difference between groups

Results

All patients	280
Male patients	262 (93.5%)
Female patients	18 (6.5%)
Mean age [years]	59.2
Median age [years]	58.3
Age range [years]	38.5-84.9
All: mean total CAC score [Agatston units]	142
Male: mean total CAC score [Agatston units]	61.3
Female: mean total CAC score [Agatston units]	147

Table 1: Baseline characteristics

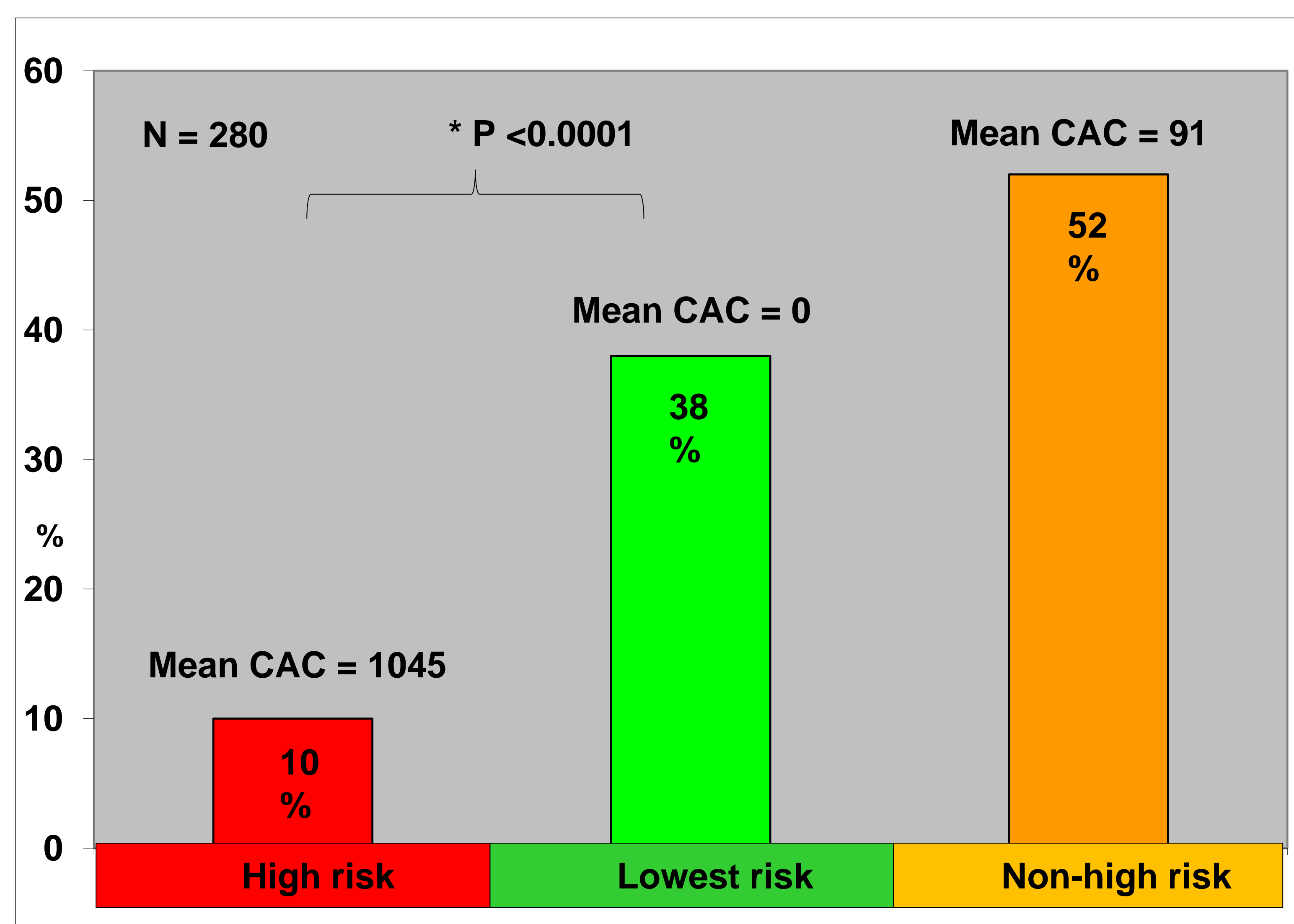


Fig 1: % of total cohort, stratified into CVD risk groups (also including mean CAC of CVD group)

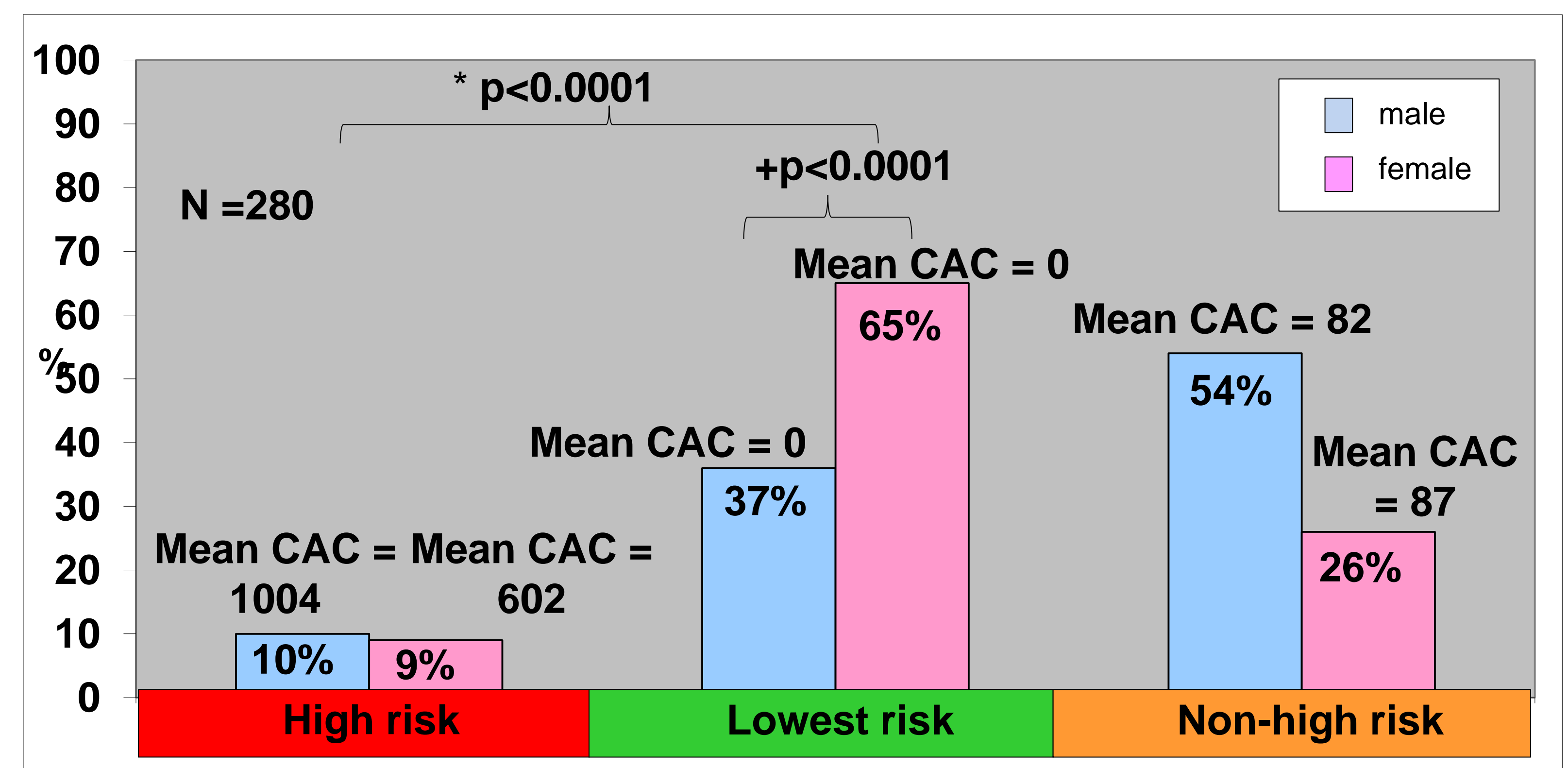


Fig 2: % of total cohort, stratified into CVD risk groups, according to sex

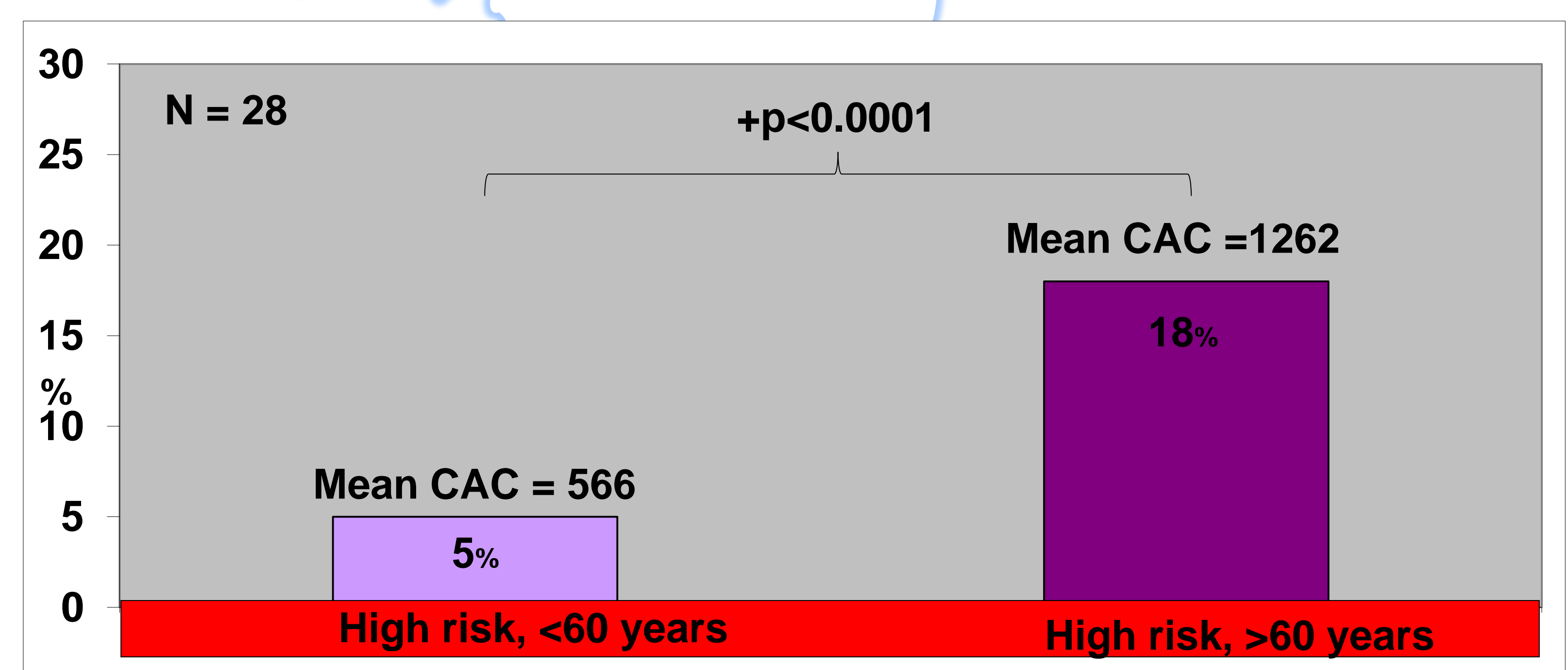


Fig 3: % of high risk cohort, stratified according to age

Conclusions

- Regardless of age or sex, 'high risk' patients were in the minority. [$p < 0.0001$]
- Significantly more patients were in fact entirely free of atherosclerosis ('lowest risk') as compared to 'high risk'. [$p < 0.0001$]
- There was no apparent difference in frequency of 'high risk' patients between males and females.
- Females were, however, significantly more likely to be 'lowest' risk as compared to males. [$p < 0.0001$]
- Significantly more 'high risk' patients were > 60 years than < 60 years. [$p < 0.0001$]

Discussion

- CTCS is a new technology that directly quantifies atherosclerosis, ameliorating the shortcomings of existing risk profiling tools, which provide only indirect estimations of risk, do not account for HIV status and were not designed for use in non-whites.
- At present, no formal guidance on the referral criteria of HIV patients for CTCS exists.
- This study indicates the 'additional' CVD risk associated with HIV, may be over appreciated by referring clinicians.
- Although limited by a non-controlled and non-selected sample size, this study identifies age (in years) as a potential means of guiding referral.
- In summary, the authors of this study support the emerging role of CTCS in identifying patients of 'high' cardiovascular risk in the HIV population.
- Well designed, prospective, multi ethnic trials investigating CTCS in the HIV population will help further guide the development of robust and evidence based referral criteria; for what is likely to become an ever increasing health consideration in an ageing HIV population.

References

- 1 NICE Guideline 95, March 2012.
- 2 N Eng J Medicine, 2008 Mar 27;358(13):1336-45
- 3 J AM Coll Cardiol, 2009 Jan 27;53(4):345-52.