CARDIOVASCULAR DISEASE RISK SCORES COMPARISON IN HIV/AIDS PATIENTS

Dragović G[1], Dimitrijević B[1], Jevtović Đ[2], Soldatović I[3], Ranin J[2], Dubravka Salemović[2], Kušić J[1]

1 - Department of Pharmacology, Clinical Pharmacology and Toxicology, School of Medicine, University of Belgrade, Belgrade, Serbia;
2- Infectious and Tropical Diseases Hospital, School of Medicine, University of Belgrade, Belgrade, Serbia;
3 - Institute for Biomedical Statistics, School of Medicine, University of Belgrade, Belgrade, Serbia;

INTRODUCTION:

Since the introduction of combination antiretroviral treatment (cART) morbidity and mortality in patients living with human immunodeficiency virus (HIV) has dramatically decreased. At the same time, higher rates of non-AIDS mortality, including cardiovascular diseases (CVD), emerged as an important issue in HIV-infected patients.

We aimed to estimate cardiovascular risk in HIV-infected patients using four cardiovascular risk scores recommended by different international guidelines: Framingham Risk Score (FRS), Systematic Coronary Risk Evaluation (SCORE), American Heart Association Aatherosclerotic Cardiovascular Disease Risk Score (ASCVD) and one score designed particularly for HIV infected patients, Data Collection on Adverse Events of Anti-HIV Drugs (D:A:D) model.

We also aimed to analyze the agreement of the high D:A:D CVD score with other high CVD scores and to calculate discriminative power for each of used scores in Serbian Caucasian HIV/AIDS patient population.

MATERIALS AND METHODS:

Patients characteristics:

We included 202 patients in cross-sectional study conducted at HIV/AIDS Center at Clinic for Infectious and Tropical Diseases, "Dr Kosta Todorovic" Belgrade, Serbia from 1st January 2014 to 1st January 2015.

We collected data on risk factors for CVD including age, gender, race, total cholesterol, blood pressure, smoking status and also HIV specific parameters such as duration and current use of lopinavir or abacavir, as well as family history. Indinavir was not prescribed in the follow-up period. Inclusion criteria were: confirmed diagnosis of HIV infection, duration of antiretroviral therapy for at least 12 months and age range of 40–79 years. Written informed consent was obtaine. Study was approved by the local Ethics committee.

Statistical analysis:

Continuous variables were presented as medians. Categorical variables were presented as frequencies with percentages. We calculated agreement between D:A:D score and three other scores using Cohen's kappa coefficient (κ). We also described discriminative power of each of the scores using receiver operating characteristic (ROC curves).

RESULTS:

All patients were Caucasians with median age of 49 years, 151 (74.8%) were males. As for traditional cardiovascular risk factors, 100 (49.5%) patients were current smokers, 64 (31%) had hypertension, while hypercholesterolemia was found in 72 (35.4%) patients. 51 (25.2%) persons were overweight (BMI>25), 15 (7.4%) were obese (BMI>30) and 45 (22.3%) had metabolic syndrome. We also find that 162 (80%) patients had CD4+ T-cells count below 350 cell/mm^3 at the least visit during the study period (Table 1).

TABLE 1. BASELINE PATIENTS CHARACTERISTICS

	N (%)
Caucasians	202 (100%)
Male	151 (74.8%)
Initial pVL	NA
Initial CD4+ (cell/m^3)	461 (194-625)
CD4+ <350 (cell/m^3) at the last visit	162 (80%)
AIDS (yes)	89 (43.9%)
Smoking (yes)	100 (49.5%)
Hypertension (yes)	64 (31.5%)
Hypercholesterolemia (yes)	72 (35.4%)

Concerning cART, 166 (82%) of our patients were previously on cART and 153 (76%) of them were on PIs, predominantly 65 (32%) on lopinavir/ritonavitr regimen. While 119 (60%) were on abacavir as a part of cART (Table 2).

TABLE 2. HISTORY OF ANTIRETROVIRAL DRUGS USAGE

		N (%)
PI ever	No	49 (23.7%)
	Yes	153 (76.3%)
PI current	No	63 (31.2%)
	Yes	139 (68.8%)
ABC	No	83 (41.4%)
	Yes	119 (58.6%)
LOP	No	137 (67.8%)
	Yes	65 (32.3%)

The prevalence of high cardiovascular disease risk scores were 8%, 13%, 35%, and 40% for SCORE, FRS, D:A:D and ASCVD score, respectively (Figure 1).

The agreement between high D:A:D score and high ASCVD score was higher (k=0.73) than between the D:A:D score and FRS (k=0.59) and for D:A:D score and SCORE (k=0.60) algorithms (Table 3).

FIGURE 1. THE ESTIMATED CVD RISK BASED ON THE ASCVD, SCORE, FRAMINGHAM AND DAD RISK EQUATIONS

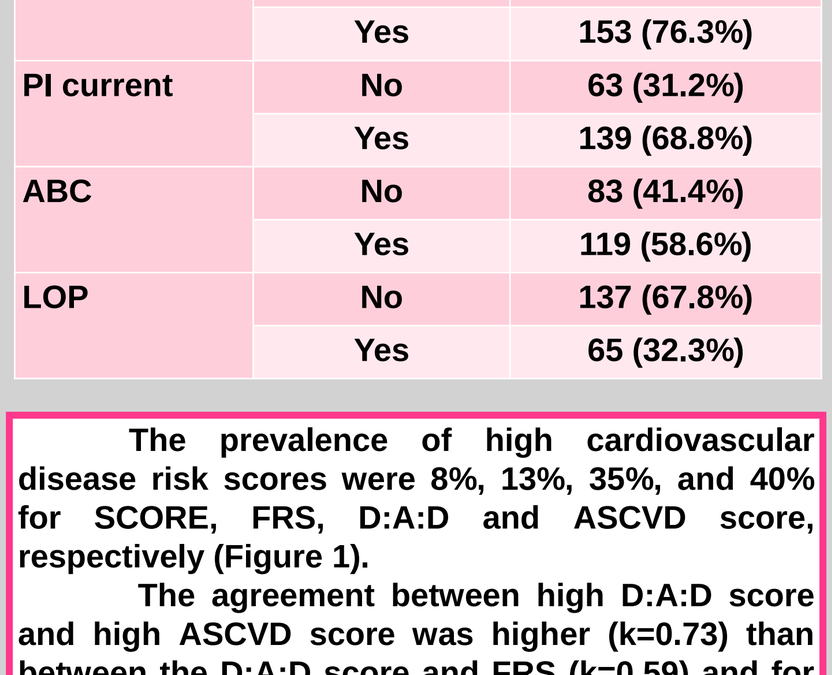
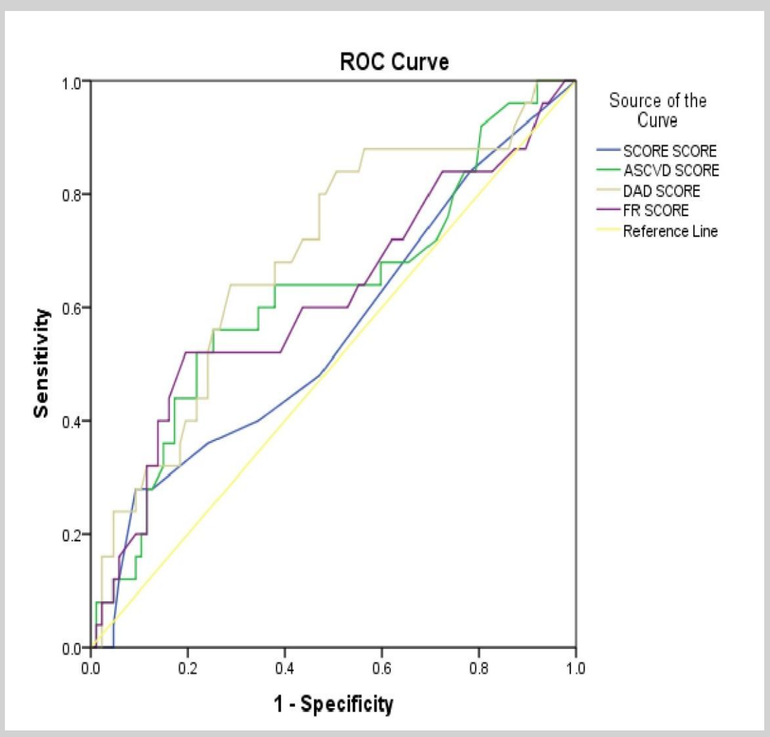


TABLE 3. AGREEMENT BETWEEN HIGH CARDIOVASCULAR RISK SCORES (KAPPA COEFFICIENT)

	DAD 5 year CVD risk >5%
Framingham 10-year CVD risk > 20%	0.59 (0.49-0.70)
SCORE project CVD mortality > 5%	0.60 (0.50-0.71)
10 year ASCVD >7.5%	0.73 (0.65-0.78)

FIGURE 2. DISCRIMINATIVE POWER BETWEEN FOUR INTERNATIONAL CVD RISK SCORES: ROC CURVES



Further statistical analysis have shown that among four estimated CVD risks equations, DAD score and ASCVD score had a highly significant predictive value for an outcome.

We also found out that DAD score had the area under the receiver operator curve (ROC) of 0.691 (p=0.004), while the ASCVD score had the area under the curve of 0.624 (p=0.05) (Figure 2).

CONCLUSION:

In our study we found a high number of HIV/AIDS patients in our population who are in need for cardiovascular risk reduction.

We also found substantional agreement of D:A:D and ASCVD risk score in order to estimate cardiovascular disease risk in Serbian Caucasian patient population.

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