CURRENT OPINION

Population and economic impact of the 2013 ACC/AHA guidelines compared with European guidelines to prevent cardiovascular disease

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Recently, the American College of Cardiology (ACC) and the American Heart Association (AHA) issued new guidelines on management of cardiovascular (CV) risk in primary prevention.[1] They developed a new CV risk calculator [new pooled cohort atherosclerotic CV disease (CVD) risk equation] targeting individuals between 40 and 75 years and based on four American population-based cohorts.[2,3] Statin treatment is recommended for individuals with an estimated 10-year risk of CVD $\geq$ 7.5%, including stroke. Conversely, the guidelines of the European Society of Cardiology (ESC) advocate the use of the SCORE equation for individuals aged between 40 and 65 years, and initiation of a statin treatment is recommended if the estimated 10-year risk of death from CVD is $\geq$ 5%.[4] Whether applying the ACC/AHA guidelines has similar public health consequences as applying the ESC guidelines is currently unknown. Hence, we used the data from a large, population-based study, to assess the country-wide population and economic impact of these new guidelines, supposing full adherence to treatment recommendations.

Data from the Swiss CoLaus study, collected between 2003 and 2006 in 3297 participants (1854 women) aged 50–75 years, were used.[5] Ten-year CVD risk was computed according to the Swiss SCORE (ESC) and the 2013 ACC/AHA risk equations; results were extrapolated to the Swiss population of the same age group. The Swiss SCORE equation has been validated in individuals up to 75 years of age. Daily cost of treatment was estimated using one widely used statin, i.e. atorvastatin.

The results are summarized in Table 1. Irrespective of the risk equation used, the prevalence of high-risk individuals increased considerably with age, exceeding 80% among participants aged over 70 years. Extrapolated to the Swiss population, applying the ACC/AHA guidelines more than doubled the prevalence of high-risk

individuals (2.2-fold in men and 1.9 fold in women) relative to the SCORE function. The biggest differences were observed for age group 50–60 years, where the ACC/AHA guidelines led to a 30-fold increase in the number of high-risk individuals relative to the ESC guidelines. Full compliance with the ACC/AHA guidelines would also lead to an extra cost of treatment of 1.124 million CHF per day (410 million CHF, or 333.7 million €, per year).

We conclude that, relative to the ESC guidelines, the 2013 ACC/AHA guidelines lead to a considerable increase in the number of high-risk individuals susceptible of receiving statin treatment. This increase is particularly strong in the age group 50–60 years. One likely explanation for this discrepancy may be due to differences in the prevalence of CV risk factors between the USA and Europe.[6,7] Consequently, if fully implemented, the ACC/AHA guidelines might lead to a considerable increase in primary prevention costs of CVD. Further studies are needed to validate the new ACC/AHA risk equation and to assess the cost-effectiveness of the ACC/AHA guidelines in non-US countries.

Authors' contributions

J.V. collected data and wrote most of the article. P.M.V. made the statistical analyses and wrote part of the article; M.P. revised the article for important intellectual content; G.W. and P.V. were the initiators of this study and revised the article for important intellectual content. P.M.V. had full access to the data and is the guarantor of the study.

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Table 1 Simulations of the population impact and of daily costs related to treatment with atorvastatin in Switzerland according to the European Society of Cardiology (ESC) or 2013 American College of Cardiology and the American Heart Association (ACC/AHA) guidelines

ESC	Swiss population			Population at risk[a]			Ratio ACC/AHA to ESC[b]			Daily cost of treatment[c]
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Atorvastatin[d]
(50–60)	561 013	551 105	1 112 118	8976	—[e]	8976	—	—	—	13
(60–70)	429 528	448 861	878 389	204 026	29 176	233 202	—	—	—	350
(70–75)	176 448	205 307	381 755	175 389	181 491	356 881	—	—	—	536
All	1 814 130	1 841 332	3 655 462	388 391	210 667	599 059	—	—	—	899
ACC/AHA										
(50–60)	561 013	551 105	1 112 118	274 335	23 698	298 033	30.6	NA	33.2	447
(60–70)	429 528	448 861	878 389	419 649	169 221	588 869	2.1	5.8	2.5	884
(70–75)	176 448	205 307	381 755	176 448	204 486	380 934	1.0	1.1	1.1	572
All	1 166 989	1 205 273	2 372 262	870 432	397 405	1 267 836	2.2	1.9	2.1	2023

[a]According to the ACC/AHA (new pooled cohort atherosclerotic CV disease risk equation) or ESC (Swiss SCORE equation) guidelines.
[b]Ratio of the number of subjects at risk according to ACC/AHA guidelines to the number of subjects at risk according to ESC guidelines. NA, not assessable.
[c]Expressed in 1000 CHF. To obtain €, multiply by 0.814; to obtain USD, multiply by 1.110. Currency exchange rates as of 3 January 2014 were applied.
[d]Fixed daily price independent of dosing (10–80 mg).
[e]SCORE equation do not predict CV risk for women under 60 years.

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