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Comparison of achieving 2019 ESC/EAS versus 2018 ACC/AHA LDL-C goals for patients with atherosclerotic cardiovascular disease: A cardiovascular risk simulation from the DA VINCI study

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BACKGROUND

- Large cardiovascular (CV) outcomes trials have demonstrated the benefits of add-on lipid-lowering therapy (LLT) for patients with atherosclerotic cardiovascular disease (ASCVD),[1,2] leading to recommendations in guidelines that LDL-C should be treated more aggressively with LLT combination therapy if patients do not achieve LDL-C goals.[3,4]
- However, the LDL-C goals for patients with ASCVD differ between the most recent European (2019 ESC/EAS; LDL-C < 55 mg/dL)[3] and US (2018 ACC/AHA; LDL-C < 70 mg/dL)[4] guidelines.
- Using data from the recent EU-Wide Cross-Sectional Observational Study of Lipid-Modifying Therapy Use in Secondary and Primary Care (DA VINCI),[5] we estimated the residual CV risk for patients with ASCVD and the extent to which risk might be lowered by achievement of each of the LDL-C goals.

METHODS

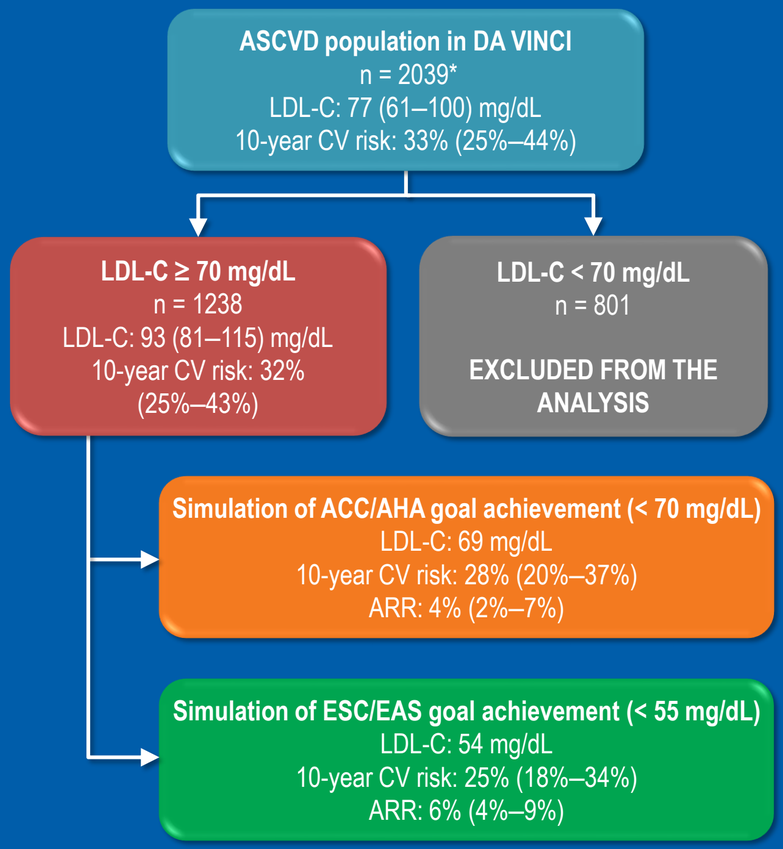
- We used data from the DA VINCI study,[5] a cross-sectional, observational study of LLT in routine clinical management that enrolled 5888 adults (age ≥ 18 years) in primary and secondary prevention across 18 European countries.
- Participants must have been prescribed LLT at the enrolment visit or within the 12 months prior to enrolment, and have had one LDL-C measurement in the 14 months prior to enrolment.
- We assessed the proportion of patients with established ASCVD and receiving stabilized LLT (no change in dose or frequency for ≥ 28 days) who achieved LDL-C goals according to 2019 ESC/EAS[3] (< 55 mg/dL) and 2018 ACC/AHA[4] (< 70 mg/dL) guidelines.
- For each patient, we:
  - estimated their 10-year CV risk using the REduction of Atherothrombosis for Continued Health (REACH) risk equation;[6]
  - calculated their absolute LDL-C reduction required to achieve LDL-C of 69 and 54 mg/dL;
  - simulated their relative risk reduction (RRR) by randomly sampling from the inverse probability distribution of the rate ratio per 39 mg/dL in the Cholesterol Treatment Trialists' Collaboration (CTTC) meta-analysis;[7]
  - calculated their absolute risk reduction (ARR) and residual risk for LDL-C of 69 and 54 mg/dL.

RESULTS

- Of the 5888 participants enrolled in the DA VINCI study, 2039 had established ASCVD, were on stabilized LLT at the time of LDL-C measurement, and had data available to calculate the REACH equation score and were included in the analysis.
- Among patients with established ASCVD, most (1238/2039; 60.7%) had LDL-C ≥ 70 mg/dL. Characteristics, CV risk factors and comorbidities for these patients are shown in **Table 1**.
- Most patients with LDL-C ≥ 70 mg/dL (1034/1238; 83.5%) were receiving statin monotherapy at the time of LDL-C measurement (**Table 2**).

For ASCVD patients with LDL-C ≥ 70 mg/dL, achieving 2019 ESC/EAS LDL-C goal would be expected to further reduce absolute risk versus achieving 2018 ACC/AHA goal

Figure 1. Predicted risk reductions associated with attainment of 2019 ESC/EAS[3] (< 55 mg/dL) and 2018 ACC/AHA[4] (< 70 mg/dL) LDL-C goals



ACC, American College of Cardiology; AHA, American Heart Association; ARR, absolute risk reduction; ASCVD, atherosclerotic cardiovascular disease; CV, cardiovascular; EAS, European Atherosclerosis Society; ESC, European Society of Cardiology; LDL-C, low-density lipoprotein cholesterol.
*Data were extracted from medical records at enrolment between June 2017 and November 2018.
Data shown represent median values with interquartile ranges.

RESULTS *(continued)*

Table 1: Patient characteristics

	N = 1238
Female, n (%)	458 (37.0)
Age, years, mean (SD)	68.0 (10.0)
BMI, kg/m^2, median (Q1, Q3)	27.4 (24.9, 30.9)
Smoking history, n (%)	
Non-smoker	504 (40.7)
Ex-smoker	503 (40.6)
Current smoker	228 (18.4)
Missing	3 (0.2)
Vascular beds involved, n (%)	
Coronary	427 (34.5)
Cerebrovascular	548 (44.3)
Peripheral	509 (41.1)
Diabetes mellitus, n (%)	487 (39.3)

Table 2. Lipid-lowering therapy use

LLT use, n (%)	N = 1238
Any statin	1131 (91.4)
High-intensity statin	461 (37.2)
Moderate-intensity statin	606 (48.9)
Low- intensity statin	43 (3.5)
Unknown-intensity statin	21 (1.7)
Ezetimibe	118 (9.5)
PCSK9i	12 (1.0)
LLT regimen at LDL-C measurement, n (%)	
Low-intensity statin monotherapy	38 (3.1)
Moderate-intensity statin monotherapy	576 (46.5)
High- intensity statin monotherapy	420 (33.9)
Ezetimibe combination therapy	87 (7.0)
PCSK9i combination therapy	8 (0.6)
Other LLT	109 (8.8)

BMI, body mass index; LDL-C, low-density lipoprotein cholesterol; LLT, lipid-lowering therapy; Q1, Q3, quartile 1, quartile 3; SD, standard deviation; y, years; PCSK9i, proprotein convertase subtilisin kexin 9 inhibitor. Results are reported as mean and standard deviation (SD), or median and interquartile range (IQR), for normally and not normally distributed continuous variables, respectively, and as absolute and relative frequencies [n (%)] for categorical variables.

- For patients with LDL-C ≥ 70 mg/dL, the median baseline LDL-C was 93 mg/dL and the estimated 10-year CV risk was 32%. LDL-C reductions of 24 and 39 mg/dL were needed to achieve LDL-C of 69 and 54 mg/dL, respectively.
- Predicted risk reductions for patients with LDL-C ≥ 70 mg/dL on achieving 2019 ESC/EAS[3] (< 55 mg/dL) and 2018 ACC/AHA[4] (< 70 mg/dL) and LDL-C goals are shown in **Figure 1**.
- 10-year CV risk was lower with attainment of 2019 ESC/EAS goal (25%) versus the 2018 ACC/AHA goal (28%).
- ARRs were 6% and 4% for attainment of 2019 ESC/EAS and 2018 ACC/AHA goals, respectively.

CONCLUSION

- **In the DA VINCI study, the majority of ASCVD patients failed to attain either 2019 ESC/EAS or 2018 ACC/AHA LDL-C goals with current LLT practice.**
- **In these patients, achieving 2019 ESC/EAS LDL-C goal results in a 2% additional absolute risk reduction versus achieving 2018 ACC/AHA goal.**

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Disclosures

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