Cost-Effectiveness Analysis of Fixed-Dose Combination Rosuvastatin and Ezetimibe Versus Simvastatin plus Ezetimibe for the Treatment of Hypercholesterolemia in Patients at High-Risk and Very High-Risk of Cardiovascular Disease in Algeria

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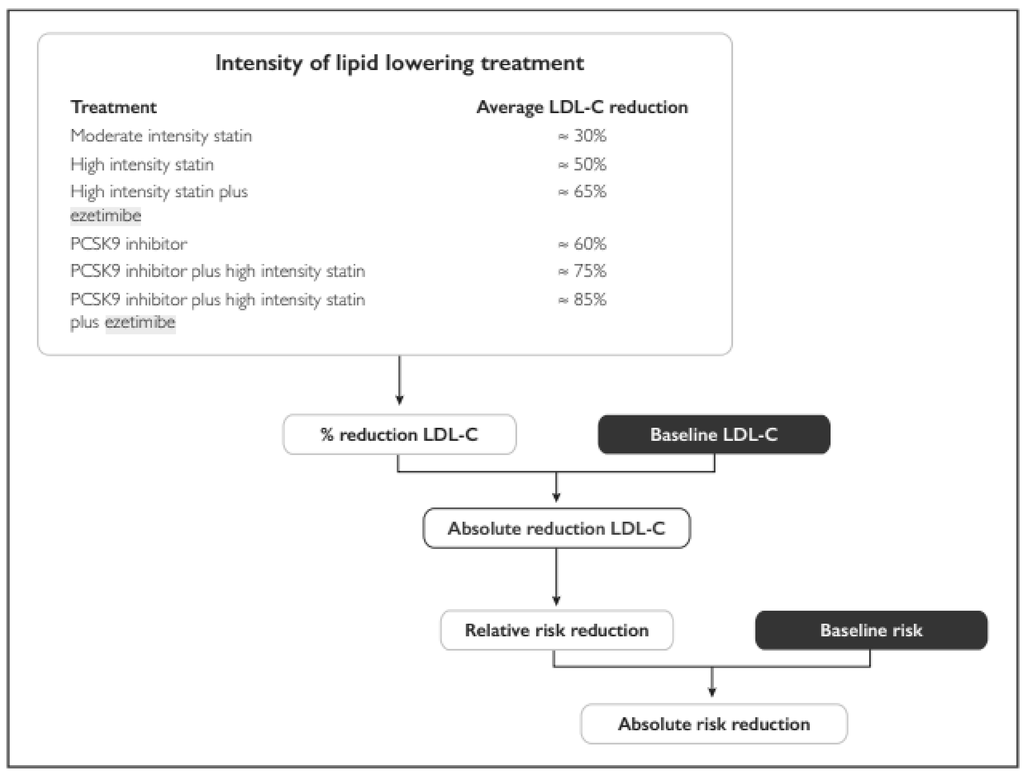
Objective

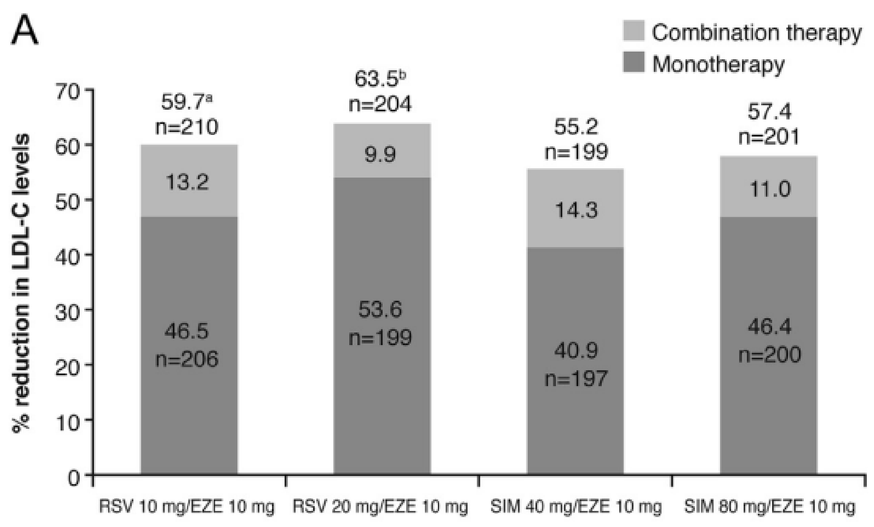
This study aims to To evaluate the cost-effectiveness of fixed-dose combination (FDC) rosuvastatin and ezetimibe (ROS/EZE) versus simvastatin (SIM) plus ezetimibe (EZE), for treating hypercholesterolemia in patients at high risk (HR) and very high risk (VHR) of cardiovascular disease (CVD) not adequately controlled with the maximum tolerated dose of statin in Algeria.

Method

A cost-effectiveness analysis was conducted over 1 year from Algerian payers' perspective using a decision tree model. Only direct drug acquisition costs were considered. Effectiveness was measured as the number of CVD events averted per 100 patients annually. The expected clinical benefits of LDL-C lowering therapies were estimated using the algorithm from 2019 ESC/EAS dyslipidemia management guidelines and the results of 2 large meta-analyses.



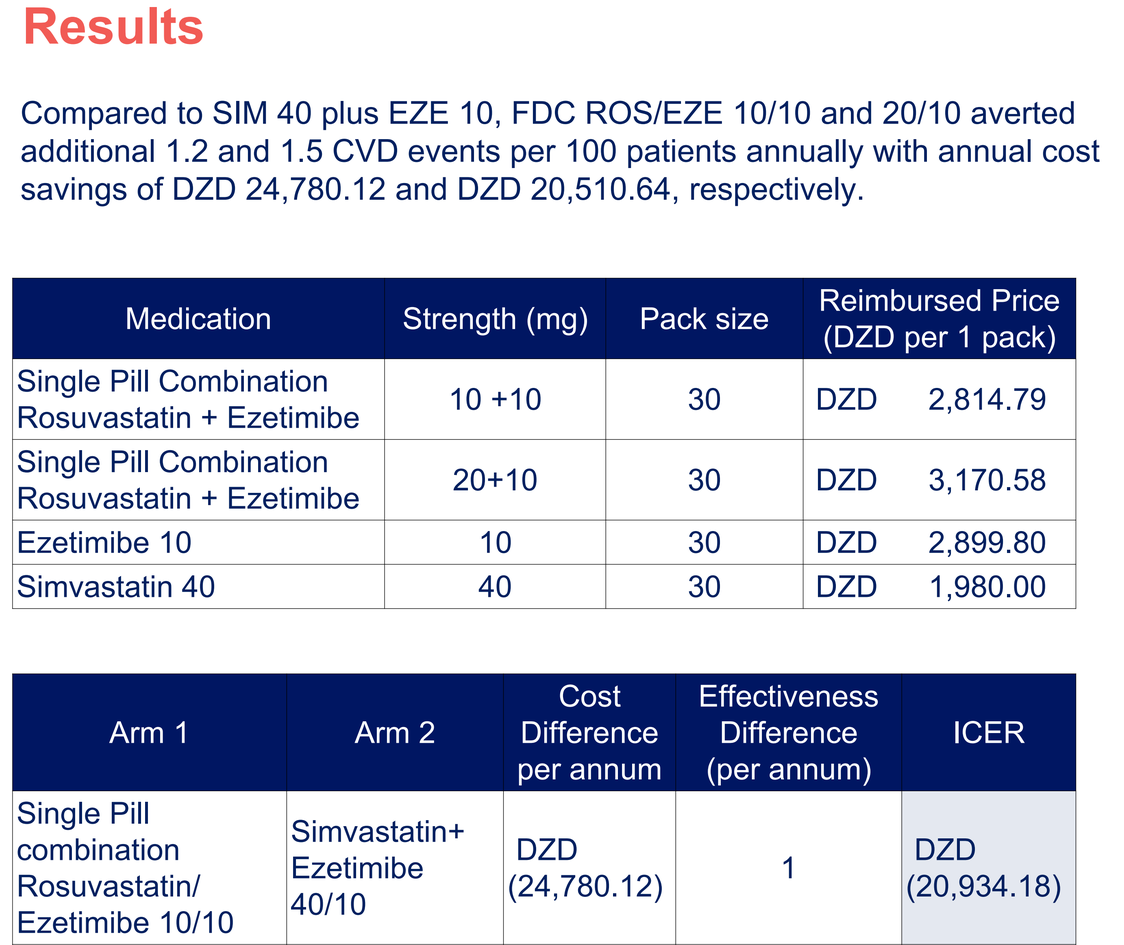
% LDL-C reduction for both treatment arms was sourced from GRAVITY trial.



Baseline LDL-C reflected the reported lipid profiles in Middle East & North Africa and pooled data from meta-analyses.

	Guideline-recommended lipid-lowering therapies			
	Statin	Ezetimibe	Statin + ezetimibe	PCSK9 inhibitor
Trials, n	26	2	3	7
Participants, n	189,501	19,865	8513	57,436
Primary prevention, n (%)	78,707 (42 %)	–	1873 (22 %)	4465 (8 %)
Secondary prevention, n (%)	110,794 (58 %)	19,865 (100 %)	6640 (78 %)	52,971 (92 %)
Age during trial, mean (range)	64.1 (57.7–77.0)	64.6 (63.6–65.6)	67.9 (65.5–69.8)	62.3 (58.4–66.9)
Baseline LDL-c (mmol/L), mean (range)	3.5 (2.3–5.0)	3.0 (2.4–3.5)	3.1 (2.1–3.6)	2.7 (2.4–3.2)
LDL-c reduction (mmol/L), mean (range)	0.92 (0.35–1.86)	0.42 (0.33–0.50)	0.93 (0.21–1.79)	1.50 (1.24–1.89)
Follow-up, mean (range)	4.3 (1.9–6.7)	5.0 (3.9–6.0)	3.6 (3.0–4.4)	1.7 (0.9–2.8)
Major vascular events, n	22,051	5913	970	5389

Primary and secondary prevention of CVD were included. Relative CVD risk reduction and baseline CVD event rates were estimated from meta-analysis for guideline recommended therapies.



Results

Compared to SIM 40 plus EZE 10, FDC ROS/EZE 10/10 and 20/10 averted additional 1.2 and 1.5 CVD events per 100 patients annually with annual cost savings of DZD 24,780.12 and DZD 20,510.64, respectively.

Medication	Strength (mg)	Pack size	Reimbursed Price (DZD per 1 pack)
Single Pill Combination Rosuvastatin + Ezetimibe	10 +10	30	DZD 2,814.79
Single Pill Combination Rosuvastatin + Ezetimibe	20+10	30	DZD 3,170.58
Ezetimibe 10	10	30	DZD 2,899.80
Simvastatin 40	40	30	DZD 1,980.00

Arm 1	Arm 2	Cost Difference per annum	Effectiveness Difference (per annum)	ICER
Single Pill combination Rosuvastatin/ Ezetimibe 10/10	Simvastatin+ Ezetimibe 40/10	DZD (24,780.12)	1	DZD (20,934.18)
Single Pill combination Rosuvastatin/ Ezetimibe 20/10	Simvastatin+ Ezetimibe 40/10	DZD (20,510.64)	2	DZD (13,542.86)

One-way sensitivity analysis (OWSA) was performed and confirmed the dominance across all scenarios tested.

Conclusion

FDC ROS/EZE is a dominant option for treating hypercholesterolemia in patients at HR and VHR of CVD in Algeria, providing economic cost savings with additional LDL-C lowering benefits and improved adherence..

References: Burger PM, Dorresteijn JAN, Koudstaal S, Holtrop J, Kastelein JJP, Jukema JW, Ridker PM, Mosterd A, Visseren FLJ. Course of the effects of LDL-cholesterol reduction on cardiovascular risk over time: A meta-analysis of 60 randomized controlled trials. Atherosclerosis. 2024 Sep;396:118540. doi: 10.1016/j.atherosclerosis.2024.118540. Epub 2024 Jul 11. PMID: 39126771.2-Cholesterol Treatment Trialists' (CTT) Collaboration; Baigent C, Blackwell L, Emberson J, Holland LE, Reith C, Bhala N, Peto R, Barnes EH, Keech A, Simes J, Collins R. Efficacy and safety of more intensive lowering of LDL cholesterol: a meta-analysis of data from 170,000 participants in 26 randomised trials. Lancet. 2010 Nov 13;376(9753):1670-81. doi: 10.1016/S0140-6736(10)61350-5. Epub 2010 Nov 8. PMID: 21067804; PMCID: PMC2988224.3- Mach F, Baigent C, Catapano AL, et al. 2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk. Eur Heart J. 2020;41(1):111–188. doi:10.1093/eurheartj/ehz4554-Kim BK, Hong SJ, Lee YJ, Hong SJ, Yun KH, Hong BK, Heo JH, Rha SW, Cho YH, Lee SJ, Ahn CM, Kim JS, Ko YG, Choi D, Jang Y, Hong MK; RACING investigators. Long-term efficacy and safety of moderate-intensity statin with ezetimibe combination therapy versus high-intensity statin monotherapy in patients with atherosclerotic cardiovascular disease (RACING): a randomised, open-label, non-inferiority trial. Lancet. 2022 Jul 30;400(10349):380-390. doi: 10.1016/S0140-6736(22)00916-3. Epub 2022 Jul 18. PMID: 35863366.5-Noubiap JJ, Bigna JJ, Nansseu JR, Nyaga UF, Balti EV, Echouffo-Tcheugui JB, Kengne AP. Prevalence of dyslipidaemia among adults in Africa: a systematic review and meta-analysis. Lancet Glob Health. 2018 Sep;6(9):e998-e1007. doi: 10.1016/S2214-109X(18)30275-4. Erratum in: Lancet Glob Health. 2019 Mar;7(3):e312. doi: 10.1016/S2214-109X(18)30519-9. PMID: 30103999.