Diabetic Dyslipidemia from Guidelines into Clinical Practice

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Introduction

Consists of specifically mild to marked elevation of triglyceride-rich lipoproteins (VLDLs) and VLDL remnants concentrations and low levels of HDL-C. Raised serum triglycerides and low HDL-C often precede the onset of T2DM for many years (Figure 1).

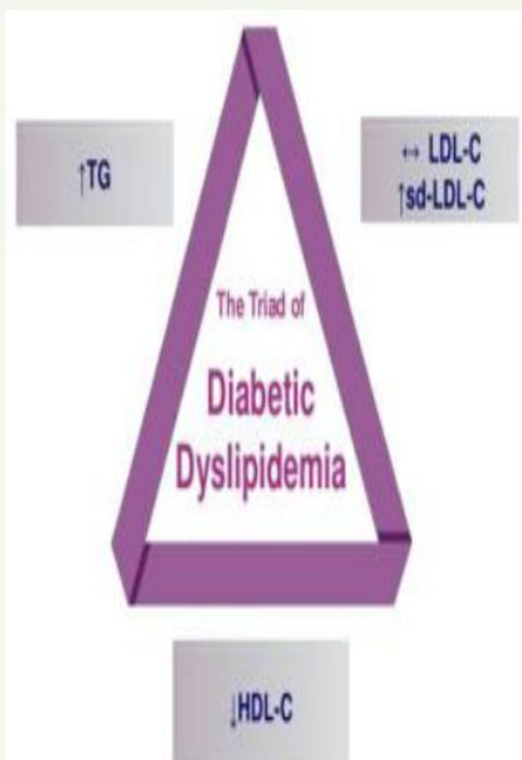
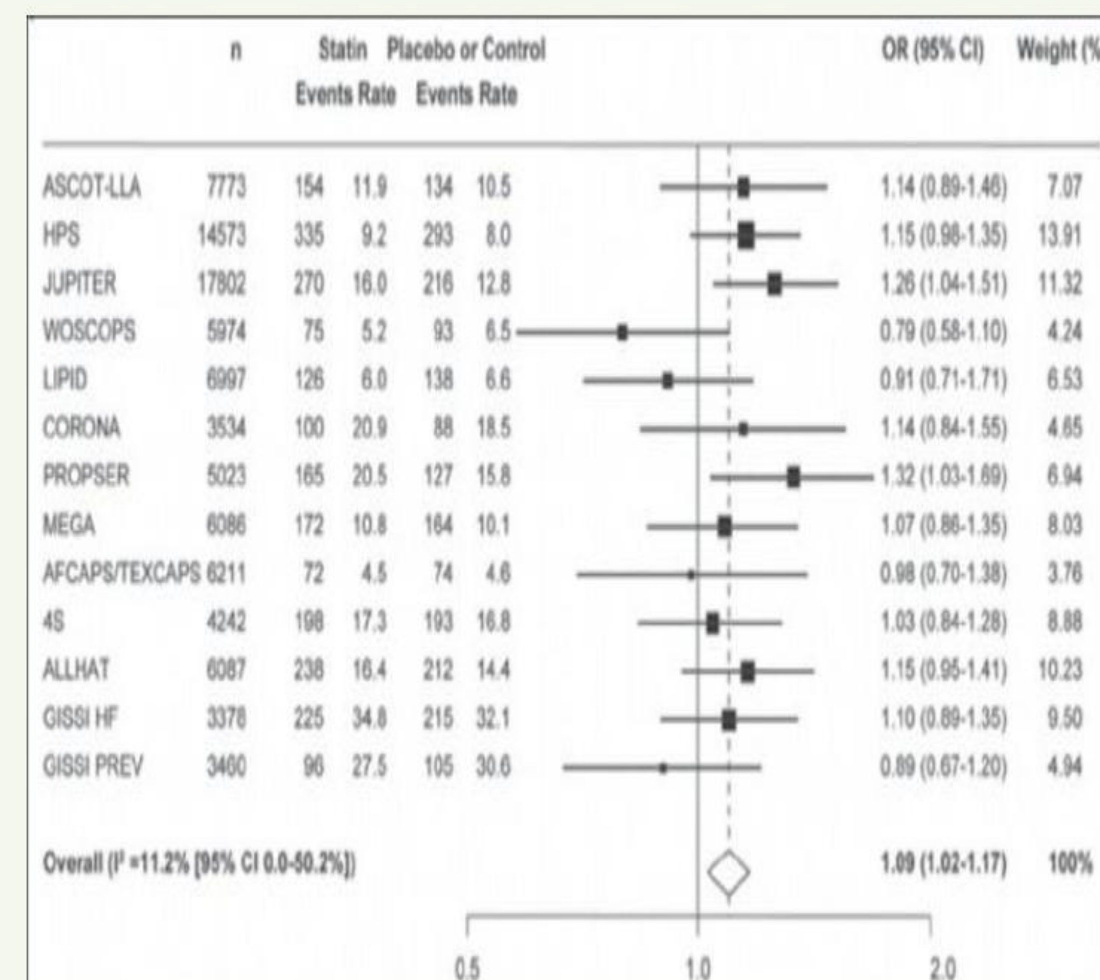


Figure 1. The triad of diabetic dyslipidemia (adapted from wikimedia, Hardikjoshi22887,,2014).

Guidelines recommendations for management of diabetic dyslipidemia:

In ATP III guidelines, any individuals 40 to 75 years of age with diabetes should be offered statin. ADA 2016 recommendations for diabetic dyslipidemia is to keep LDL <100 mg/dl(high risk group keep <70 mg/dl),TG< 150 mg/dl and HDL> 40mg/dl in men, and >50 mg/dl in women.



	n	Statin Events	Statin Rate	Placebo or Control Events	Placebo or Control Rate	OR (95% CI)	Weight (%)
ASCOT-LLA	7773	154	11.9	134	10.5	1.14 (0.89-1.46)	7.07
HPS	14573	335	9.2	293	8.0	1.15 (0.98-1.35)	13.91
JUPITER	17802	270	16.0	216	12.8	1.26 (1.04-1.51)	11.32
WOSCOPS	5974	75	5.2	93	6.5	0.79 (0.58-1.10)	4.24
LIPID	6997	126	6.0	138	6.6	0.91 (0.71-1.71)	6.53
CORONA	3534	100	20.9	88	18.5	1.14 (0.84-1.55)	4.65
PROPSER	5023	165	20.5	127	15.8	1.32 (1.03-1.69)	6.94
MEGA	6086	172	10.8	164	10.1	1.07 (0.86-1.35)	8.03
AFCAPS/TEXCAPS	6211	72	4.5	74	4.6	0.98 (0.70-1.38)	3.76
4S	4242	198	17.3	193	16.8	1.03 (0.84-1.28)	8.88
ALLHAT	6087	238	16.4	212	14.4	1.15 (0.95-1.41)	10.23
GISSI HF	3378	225	34.8	215	32.1	1.10 (0.89-1.35)	9.50
GISSI PREV	3460	96	27.5	105	30.6	0.89 (0.67-1.20)	4.94
Overall (I^2 =11.2% [95% CI 0.0-50.2%])						1.09 (1.02-1.17)	100%

Figure 3. Association between statin therapy and new onset diabetes in 13 major cvs trials. Treatment of 255 patients with Statins for 4 years resulted in one extra case of diabetes. Sattar N, Ray. Lancent 2010; 375: 735-42.

Pathophysiology of Diabetic Dyslipidemia:

- In diabetes, greater amounts of FFAs returning to the liver are reassembled into triglycerides and secreted in VLDL.
- Due to the elevation of triglyceride concentration, VLDLs remains in circulation for longer periods. This allows an increased transfer of cholesterol esters, leads top production of sdLDL (Figure 2).
- In poorly controlled T1DM, insulin replacement in these patients correct lipid abnormalities completely.
- In T2DM, this phenotype is not usually fully corrected with glycemic control, suggesting that insulin resistance and not hyperglycemia per se are associated with this lipid abnormality.

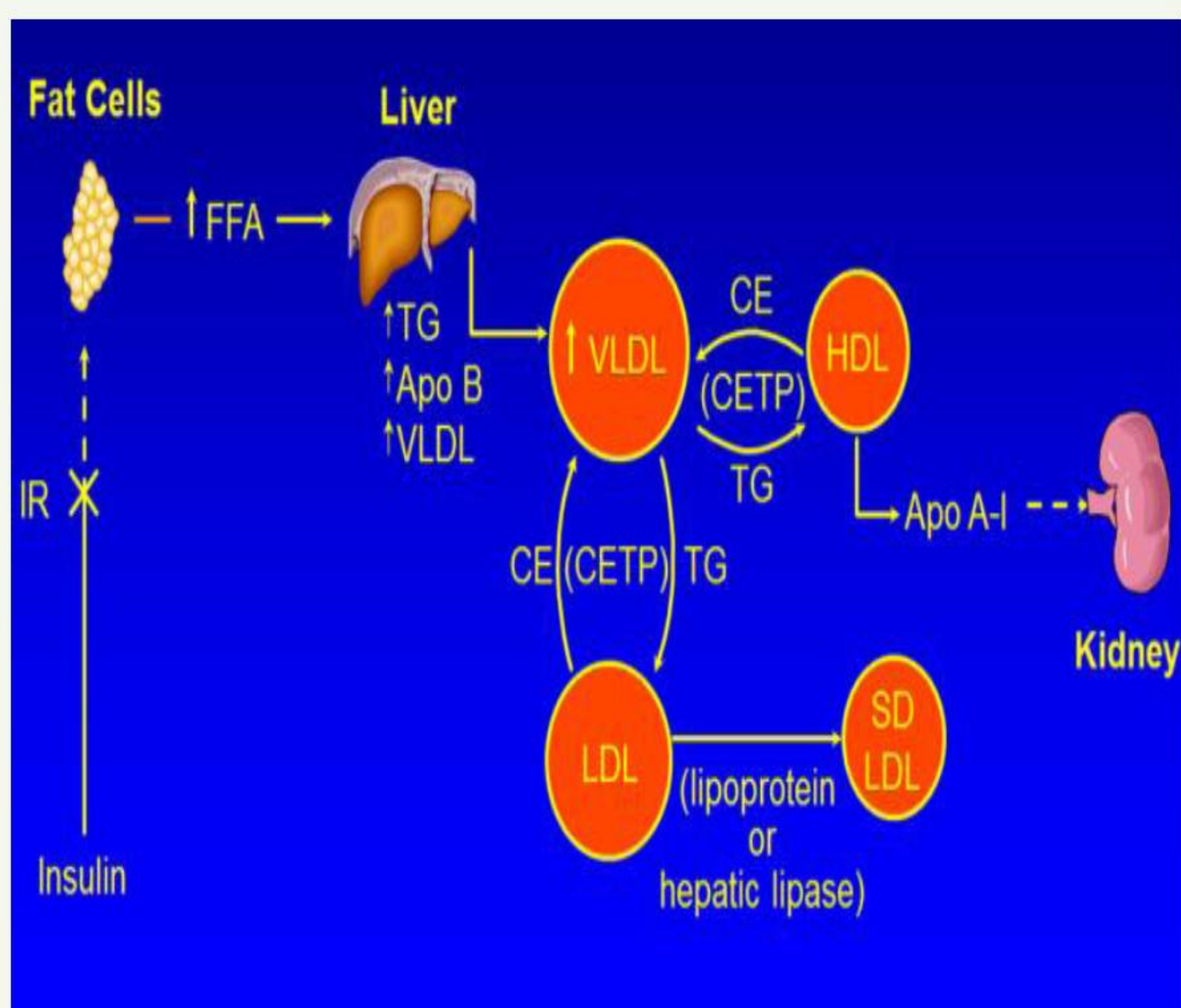


Figure 2. Pathophysiology of diabetic dyslipidemia, adapted from Endotext (http://www.endotext.org/chapter/page/7/) .

Four rules in diabetic dyslipidemia managment:

•Diabetic Dyslipidemia Rule 1: Always achieve LDL target first with statin unless TG >500 mg/dl. Keeping LDL<100 mg/dl (<70mg/dl in high risk).
•Diabetic Dyslipidemia Rule 2:Use high intensity statin in high risk patient (CVS events) Figure 3.
•Diabetic Dyslipidemia Rule 3:Add Fibrates to statin when TG>200 and HDL<40 mg/dl.
•Diabetic Dyslipidemia Rule 4: The benefit of statin in lipid reduction, outcomes the risk of New Onset Diabetes (figure, 3).

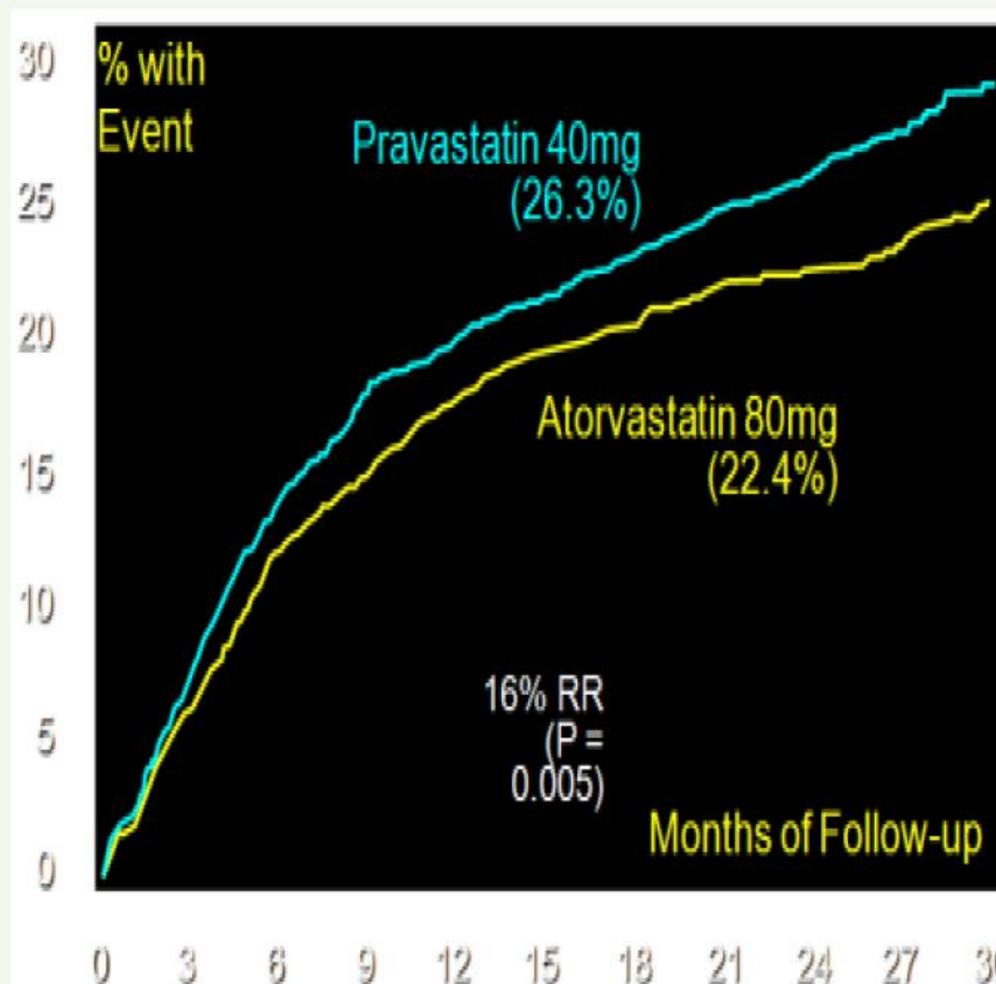


Figure 3. Intensive lipid lowering with the 80-mg dose of atorvastatin, as compared with moderate lipid lowering with the 40-mg dose of pravastatin, reduced the hazard ratio for death or a major cardiovascular event by 16 percent. Cannon CP, Braunwald E, McCabe CH, et al. N Engl J Med 2004;350:15

Conclusion and recomendations:

Individuals 40 to 75 years of age with diabetes, should be offered statin .An approximate 23% reduction in CVD events per 1 mmol/l reduction in LDL-C, with no threshold below which benefit ceases. Achievement of Lipid targets is key in reduction of CVS mortality in diabetic patients.

References:

1. **ADA Guidelines 2016.**
2. **Diana Muačević-Katanec; Željko Reiner,diabetic dyslipidemia, medscape, 2011;9(3):341-348.**

Acknowledgement

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