Effects of fenofibrate on plasma oxidized LDL and 8-isoprostane in a sub-cohort of GOLDN participants.

BACKGROUND: Fenofibrate significantly reduces circulating triglyceride (TG) concentrations, particularly in individuals with elevated levels. The purpose of the current study was to determine whether fenofibrate treatment reduces markers of oxidative stress, oxidized low density lipoprotein (ox-LDL) and 8-isoprostane (8-isoP), in a manner similar to TG where those with the highest levels show the greatest reductions.

MATERIALS/METHODS: The concentrations of TG, 8-isoP, and ox-LDL were measured in plasma before and after 3 weeks of fenofibrate treatment (160 mg/d) in a sub-cohort (n=187) of the Genetics of Lipid Lowering Drugs and Diet Network (GOLDN) study.

RESULTS: Data were divided into tertiles as determined by pre-treatment values of the respective target. Fenofibrate treatment resulted in significant reductions in TG concentrations by 24.2% (p<0.0001), 41.9% (p < 0.0001), and 46.6% (p < 0.0001) in tertiles 1, 2, and 3, respectively. Significant reductions were also observed in ox-LDL of 7.2% (p=0.0096), 8.5% (p = 0.0019) and 12.1% (p < 0.0001) in tertiles 1, 2, and 3, respectively. Finally, fenofibrate treatment resulted in a 32.7% increase (p=0.0201) in 8-isoP levels in tertile 1, but a significant decrease of 34.4% (p < 0.0001) in tertile 3.

CONCLUSIONS: This study is the largest to date
to demonstrate that fenofibrate reduces oxidative stress and the first to show a suppressive effect on 8-isoP levels in individuals with a high oxidative burden following short term (3 wk) drug therapy. Those with the highest baseline levels of ox-LDL and 8-isoP showed the greatest reductions following fenofibrate treatment. Given the role of oxidative stress in atherosclerosis and coronary heart disease, our observations may partially explain the efficacy of fenofibrate in reducing cardiovascular events in select patients.

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