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# Stable Ischemic Heart Disease

## THE DIRECT EFFECTS OF NIFEDIPINE ON CHOLESTEROL CRYSTALLIZATION AND VULNERABLE PLAQUE'S

Poster Contributions
Poster Hall B1
Monday, March 16, 2015, 9:45 a.m.-10:30 a.m.

Session Title: Coronary Plaque, Macro- and Microvessels
Abstract Category: 25. Stable Ischemic Heart Disease: Basic
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Authors: *Abrar R. Sayeed, Ehtesham Sayeed, Omair Ali, Abdul Wase, George Abela, Wright State University, Dayton, OH, USA, Michigan State University, East Lansing, MI, USA*

**Background:** We have previously demonstrated that cholesterol expands when crystallizing from a liquid to a solid state forming sharp tipped crystals that can tear fibrous membranes. This model might provide insight into the mechanism of plaque rupture.The present study evaluated the potential direct effects of Nifedipine in altering cholesterol crystallization as a possible mechanism for plaque stabilization independent of its cardio-protective effect.

**Methods:** Cholesterol powder (3 g) was melted in 10-ml graduated cylinders with and without Nifedipine using a heat gun and then allowed to cool at room temperature. Graded doses of Nifedipine were added to the cholesterol to achieve concentrations comparable to serum levels achieved after a single dose of 60, 90 and 120mg. Water in 3gm of cholesterol was used as control. Five experiments were conducted at each concentration and the change in volume expansion was measured and averaged for each dose and compared with control. Scanning electron microscopy (SEM) was used to evaluate cholesterol crystal morphology.

**Results:** The effect of Nifedipine on cholesterol crystallization was evident by a significant dose-dependent suppression of volume expansion (ΔVE) during crystallization with a P value <0.005. By SEM, the structure of crystals was altered from pointed tipped to a blunt and dissolving morphology.

**Conclusion:** These findings suggest that CCB's may have additional cardio-protective action by its stabilizing effect on vulnerable plaques.

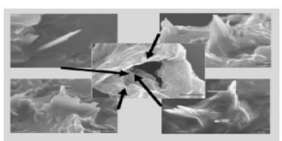


**Figure 1.** Scanning electron micrograph (SEM) of left anterior descending artery in a patient who died with acute cardiovascular event. Cholesterol crystals are noted perforating the intimal surface just below the plaque rupture site (1).

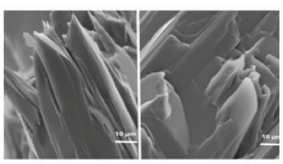
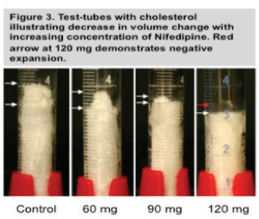


Figure 2. SEM of cholesterol crystals without (left) and with (right) Nifedipine (120 mg). Sharp crystal tips (left) and blunted tips (right).



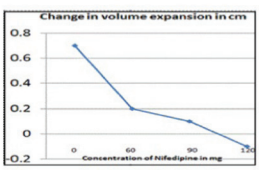




Figure 4. Volume change decreases with increasing concentrations of Nifedipine.