minimum effective dosage of CoQ10 supplementation.

The lack of a dose-response effect observed between CoQ10 dosage and myalgias or serum creatine kinase levels could still be consistent with benefit from CoQ10 if the dose-response curve is not linear but rather a threshold effect (step function), whereby no benefit is seen from CoQ10 supplementation until a certain threshold dosage is exceeded. If that threshold dosage turns out to be greater than 400 mg, it would explain why no benefit was seen in this meta-analysis: perhaps too little CoQ10 was administered.

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1. Banach M, Serban C, Sahebkar A, et al; Lipid and Blood Pressure Meta-analysis Collaboration Group. Effects of coenzyme Q10 on statin-induced myopathy: a meta-analysis of randomized controlled trials. *Mayo Clin Proc*. 2015;90(1):24-34.

http://dx.doi.org/10.1016/j.mayocp.2015.01.006

Coenzyme Q10 and Statin-Induced Myopathy—II

To the Editor: Myopathy is a major clinical problem that contributes considerably to statin therapy discontinuation. Banach et al[1] must be commended for their meta-analysis of randomized controlled trials (6 studies with 302 patients) investigating the impact of coenzyme Q10 (CoQ10) on statin-induced myalgia. They concluded that the results do not suggest any significant benefit: CoQ10 supplementation had no significant effect on muscle pain despite a trend toward a decrease (standardized mean difference, −0.53). Could they explain why they also concluded that "larger, well-designed trials are necessary to confirm the findings from this meta-analysis"? First, there is little rationale for CoQ10 supplementation, as no studies have found a correlation between intramuscular CoQ10 levels and statin-induced myopathy. Moreover, CoQ10 supplementation induced a trend toward an increase in plasma creatine kinase activity in their study (mean difference, 11.69 U/L). Second, although the trend toward a decrease in muscle pain could be significant with more patients, could it be clinically relevant? Lastly, there are multiple and effective management options for statin-intolerant patients.[2]

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http://dx.doi.org/10.1016/j.mayocp.2015.01.005

In reply—Coenzyme Q10 and Statin-Induced Myopathy

We thank Drs Keller and Braillon for their interest in our article.[1] Dr Keller suggests that there is a need to evaluate higher dosages of coenzyme Q10 (CoQ10) (at least 600 mg/d) in patients with statin-induced myopathy (SIM), an issue we mentioned in our meta-analysis. However, actually conducting such a study is problematic. Specifically, a considerable amount of research now depends on the financial interests of the pharmaceutical industry. The limited amount of research on CoQ10 to date[1] probably reflects their current interest and offers a preview of future interest.

Additionally, all cases of SIM are not due to a single cause.[2,3] It follows that CoQ10 supplements, even if effective, may not benefit all cases of SIM. Studies evaluating the role of CoQ10 supplements in patients with SIM would have to involve very large numbers of patients and/or exclude SIM not potentially related to CoQ10 deficiency. These requirements have considerable methodological and cost implications. First, SIM/statin intolerance should be classified using a uniform method.[2,3] Another question is whether higher dosages of CoQ10 have adverse effects.[4] Contemporary data concerning the administration of CoQ10 at dosages higher than 1200 mg/d are limited.[4] It is usually recommended to administer up to 400 mg/d of CoQ10 for patients older than 18 years.[4] Despite the fact that CoQ10 appears to be generally very safe with no major adverse effects, it is known that it may, among other effects, slightly lower blood glucose concentrations, interfere with chemotherapy medications, interfere with antihypertensive and anticoagulant therapies, affect thyroid hormone concentrations, and interact with thyroid hormone replacement therapy.[4] Thus, studies with high dosages of CoQ10 are needed.[1-4]

We agree with Dr Braillon that there is no definitive link between SIM and CoQ10. Nevertheless, as outlined previously, there is enough evidence to consider this topic further. In our study, the small increase of plasma creatine kinase activity (mean, 11.69 U/L) was not statistically significant, and there was also a wide confidence interval of −14.25 to 37.63 U/L. This means that this topic still needs to be investigated in larger trials with longer follow-up (and at higher dosages of CoQ10).[1]

We also agree that there are several options for the management of statin intolerance, but they may not always be effective. For example, we can use ezetimibe after the recently encouraging results of the IMProved Reduction of Outcomes: Vytorin Efficacy International Trial (IMPROVE-IT).[5] Another choice

may be to correct vitamin D deficiency.[2] New lipid-lowering drugs may also prove useful in reducing the risk of SIM altogether.[6]

Statin discontinuation (or reducing statin dosage) is a very relevant clinical issue because it may increase the risk of cardiovascular events.[7] Therefore, we need to continue our efforts to provide optimal treatment of hyperlipidemia while avoiding (or appropriately treating) SIM.

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1. Banach M, Serban C, Sahebkar A, et al; Lipid and Blood Pressure Meta-analysis Collaboration Group. Effects of coenzyme Q10 on statin-induced myopathy: a meta-analysis of randomized controlled trials. *Mayo Clin Proc*. 2015; 90(1):24-34.
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Type A Aortic Dissection in Fibromuscular Dysplasia

To the Editor: Fibromuscular dysplasia (FMD) is a rare, noninflammatory vascular disease characterized by arterial stenosis and aneurysm or dissection most commonly affecting renal, carotid, and vertebral arteries.[1] Although multiple arterial involvement has been described in the literature,[2-5] no surveillance strategies are in place, which often results in catastrophic consequences.

Report of a Case. A 70-year-old woman presented with severe, nonexertional substernal chest pain radiating to the right shoulder. She had a history of FMD, subarachnoid hemorrhage in 2001, ischemic stroke in 2011, and well-controlled hypertension. Transesophageal echocardiography performed in 2011 for stroke work-up had revealed a borderline dilatation of the ascending aorta measuring 3.5 cm. Her pertinent physical examination results included blood pressure of 136/76 mm Hg, equivalent in both arms, and normal S_1 and S_2 heart sounds without murmur. Electrocardiography revealed ST-segment depression and new T-wave flattening in the lateral leads. Echocardiography illustrated normal left ventricular function with a dilated aortic root (4.3 cm). Urgent cardiac catheterization and

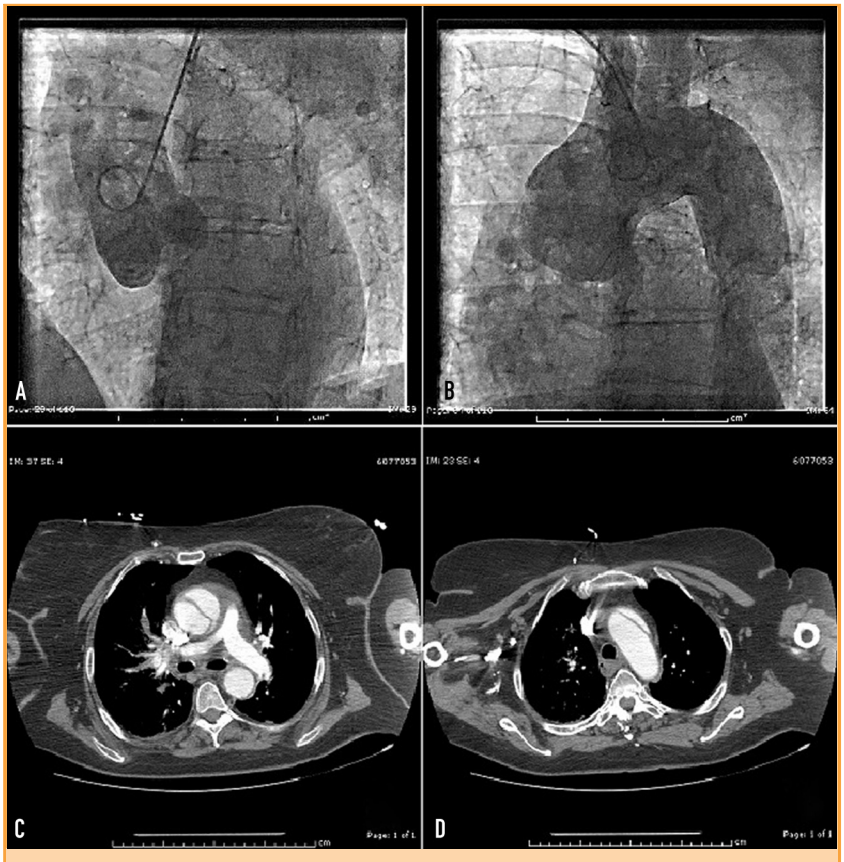

FIGURE. Diagnostic studies in a 70-year-old woman with severe, nonexertional substernal chest pain radiating to the right shoulder. Urgent cardiac catheterization and aortography revealed aortic root dilatation without aortic insufficiency (A, B) and a possible large ascending aortic aneurysm. Computed tomographic angiography of the thorax revealed type A aortic dissection (C, D).