HDL cholesterol: atherosclerosis and beyond
Bochem, A.E.

Citation for published version (APA):
Cardiovascular event in a 36 year-old man with combined \textit{ABCA1} and apoA-I deficiency

Submitted for publication

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A 36-year-old man was admitted because of acute chest pain. Upon diagnostic procedures, an acute myocardial infarction (AMI) was confirmed and a percutaneous coronary intervention (PCI) was performed with stent placement of a bare metal stent (BMS) in the ramus circumflex. After one week, an elective PCI with BMS placement in the right coronary artery was performed.

The patient reported to smoke. His blood pressure was 133/97 mmHg and BMI was 27.8 kg/m². No murmurs over peripheral arteries, xanthomas, xanthelasmata or arcus lipoides were observed. Laboratory results were unremarkable except for a near absence of HDL-c (0.09 mmol/L).

The patient has two healthy brothers, with unknown HDL-c levels. His father experienced an AMI at the age of 48. His father’s brother had an AMI at the age of 50 and his father’s sister died from an unknown cause at the age of 50. His mother is 57 years-old and healthy except for diabetes and extremely low HDL-c levels (0.21 mmol/L) (figure C).

Genes involved in HDL-c metabolism were sequenced and both an ATP-binding cassette transporter A1 (ABCA1) mutation (p.Asn1800His;c.5398A>C) and an apolipoprotein AI (apoA-I) mutation (p.Leu202Pro;c.605T>C) (figure D) were identified. ABCA1 is essential for reverse cholesterol transport (RCT) by virtue of its ability to transport cholesterol from macrophages to lipid-poor apoA-I, the major protein constituent of the HDL particle. This combined molecular defect, which has not been described before, is consistent with the observed near absence of HDL-c and is likely to have constituted a substantial risk factor in this patient, since there was no abundance of other cardiovascular risk factors. Since specific HDL-c increasing therapy is not available yet, prevention focuses on modulating other risk factors such as LDL-c lowering.
Left coronary artery: occlusion in ramus circumflex (culprit lesion), no significant lesion in the left anterior descending branch; B. Right coronary artery: significant stenosis in mid portion with pre and post dilatation of the vessel; C. Patient’s pedigree: lipid profiles are in mmol/L, percentiles for age and gender between brackets; D. Mutations in Apolipoprotein A-I and ATP-binding cassette transporter A1.