Intermediate density lipoprotein is associated with monocyte subset distribution in patients with stable atherosclerosis

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Background: Intermediate density lipoprotein (IDL) consists mainly of chylomicron remnants and very low density lipoprotein (VLDL) remnants that are thought to be proinflammatory lipoprotein particles. Atherosclerosis is considered to be an inflammatory disease of the vessel wall in which monocytes and monocyte-derived macrophages are crucially involved. Circulating monocytes can be divided according to their surface expression pattern of CD14 and CD16 into at least three subsets with distinct inflammatory and atherogenic potential. The aim of this study was to investigate whether IDL is associated with proinflammatory monocyte subsets.

Methods: We included 90 patients with stable coronary artery disease (CAD). Monocyte subsets were identified as classical monocytes (CD14++CD16-; CM), intermediate monocytes (CD14++CD16++; IM) and non-classical monocytes (CD14+CD16++; NCM) by flow cytometry. Lipoprotein subfractions were measured by an electrophoresis method on polyacrylamide gel.

Results: IDL correlated significantly with the proinflammatory IM (r=0.24; p<0.05) whereas VLDL and low density lipoprotein (LDL) were not associated with monocyte subtypes. IDL was not associated with CM (r=0.18; p=0.09) and NCM (r=0.16; p=0.13) but correlated significant with the acute phase protein C-reactive protein (r=0.40; p<0.01). The association of IDL with IM was independent of cardiovascular risk factors and statin treatment. Patients with IDL>median (38mg/dL) showed a significant higher proportion of IM as compared to patients with IDL<38mg/dL (5.6 IQR 4.3-8.3% vs. 4.1 IQR 2.6-6.2%).

Conclusion: In conclusion, we provide a potential link between elevated levels of IDL and a proinflammatory distribution of monocyte subtypes in patients with stable atherosclerotic disease. This possible proatherogenic role of IDL warrants further studies.