Biomarkers of inflammation and chronic diseases

Half-time Review 2018-05-25

Background:
Cardiometabolic diseases are one of the leading causes of mortality and morbidity worldwide. Inflammation is associated with various cardiovascular and metabolic diseases. Additionally, arterial stiffness is a risk factor for cardiovascular diseases. Although many associated risks are known, there is a need to explore novel risk factors beyond the established ones for early risk stratification.

Aim:
Three projects will be presented at this half time. The aim of the first project is to explore the association between plasma levels of the acute-phase proteins ceruloplasmin, alpha-1-antitrypsin, orosomucoid, haptoglobin and C-reactive protein (CRP), and incidence of diabetes. The second project aims to explore the relationship between six acute phase proteins namely, ceruloplasmin, alpha-1-antitrypsin, orosomucoid, haptoglobin, complement C3 and CRP, and carotid-femoral pulse wave velocity (c-f PWV) in a population-based cohort. In the final project, the relationship between arterial stiffness, as determined by c-f PWV, and incidence of diabetes is investigated.

Method:
Data for the present research projects was used from the prospective population based cohort Malmö Diet and Cancer study-Cardiovascular cohort, with information from baseline examinations (1991-1994) and follow-up examinations (2007-2012). Plasma levels of inflammatory markers were determined during the baseline examinations. Arterial stiffness was measured at follow-up by determining c-f PWV. Information about covariates and other risk factors was obtained at both baseline and follow-up.

Results:
High plasma levels of orosomucoid, haptoglobin and CRP were found to be associated with the increased risk of incidence of diabetes. While exploring the association between biomarkers of inflammation and arterial stiffness, alpha-1-antitrypsin, C3 and CRP were shown to be significantly associated. Lastly, it was shown that increased c-f PWV is associated with increased incidence of diabetes, independent of other risk factors.

Significance:
This doctoral project focuses on identifying novel risk factors associated with the development of cardiometabolic diseases.
Publications:

