

Risk stratification in coronary artery disease : the role of (bio)markers and coronary CT-angiography

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SUMMARY

Cardiovascular disease, including coronary artery disease, is still one of the major causes of mortality and morbidity in Western and developing countries. After decades of decline, it is expected that the proportion of cardiovascular disease will increase again, accompanied by high healthcare costs. Therefore, cardiovascular disease is a rising major global health problem. Atherosclerosis, a multifactorial chronic inflammatory disease, is the main cause of coronary artery disease. Atherosclerosis is not limited to the coronary arteries, but is a systemic disease, which can result in complications like myocardial infarction, stroke and peripheral artery disease.

With the use of coronary CT-angiography it is possible to visualize characteristics of coronary artery disease, especially the presence, extent, degree and morphology of coronary plaques. Coronary CT-angiography has a reasonable diagnostic accuracy to detect obstructive coronary artery disease and a proven prognostic value to predict major adverse cardiovascular events.

In this thesis, we related characteristics of coronary artery disease, as measured with coronary CT-angiography, with (bio)markers, as a first step in order to improve risk stratification in patients with suspected coronary artery disease. Furthermore, we tried to gain more insight into underlying mechanisms between atherosclerosis, coagulation and immunology.

SAMENVATTING

A stylized, glowing red heart is the central focus, rendered with a translucent, glass-like texture. A white ECG (heart rate) line is overlaid across the heart, showing several distinct peaks. The background is a deep red with intricate, glowing white patterns that resemble a grid or a complex network of lines, creating a sense of depth and technological sophistication. A bright white starburst light is visible in the upper right quadrant, adding to the overall luminous and high-tech aesthetic.

Hart- en vaatziekten, waaronder coronairlijden, is een van de belangrijkste oorzaken van ziekte en overlijden in zowel de Westere wereld alsook in landen die zich sterk aan het ontwikkelen zijn. Jarenlang is er een afname van hart- en vaatziekten geweest, maar de verwachting is dat hart- en vaatziekten weer sterk gaan toenemen, wat gepaard gaat met een toename van de gezondheidszorgkosten. Hierdoor blijven hart- en vaatziekten een belangrijk, wereldwijd gezondheidsprobleem.

Atherosclerose is een multifactoriele chronische ontstekingsziekte. Het is de belangrijkste oorzaak van coronairlijden. Het komt echter niet alleen in de coronairvaten voor, maar is een systemische ziekte die uiteindelijk kan leiden tot een hartinfarct, herseninfarct of perifereer vaatlijden.

Door middel van cardiale CT-angiografie is het mogelijk om meer inzicht te krijgen in de aanwezigheid, ernst en mate van coronairlijden. Bovendien is het mogelijk om coronaire plaques beter te karakteriseren wat betreft morfologie. CT-angiografie is geschikt voor het aantonen van obstructief coronairlijden. Daarnaast heeft het ook een bewezen waarde in het voorspellen van ongewenste cardiovasculaire events.

In dit proefschrift hebben we kenmerken van coronairlijden, zoals we die bepaald hebben met CT-angiografie, gerelateerd aan (bio)markers. Doel hiervan is om de risicostratificatie van patiënten met een verdenking op coronairlijden te verbeteren. Daarnaast hebben we ook meer inzicht proberen te krijgen in de onderliggende mechanismen tussen atherosclerose, bloedstolling en immunologie.

