Atrioventricular imaging to predict outcome in dilated cardiomyopathy

Scientific and societal impact

This chapter discusses the future valorization of the findings presented in this thesis.

Socio-economic relevance

Due to the aging of the population, the prevalence and incidence of heart failure (HF) will only increase in the coming years. Currently, there are more than 240,000 people suffering from HF in the Netherlands, of which about 30% have dilated cardiomyopathy (DCM), thereby contributing to a large extent to the overall health care burden. Even though great investments have been made in recent years to optimize HF treatment with medication and devices, the 5-year survival rate is still approximately 50% and there are yearly about 30,000 hospitalizations and 7,000 deaths due to HF in the Netherlands. This obviously imposes a great burden on the Dutch health care system.

DCM patients have different clinical characteristics from 'regular' HF patients. They are younger and have fewer comorbidities than the average HF patient. Nonetheless, current treatment strategies are initially the same for all HF patients, but this does not result in improvement or recovery in all DCM patients. This is likely due to the heterogeneity of the disease, and better disease classification and personalized treatment plans are warranted. By using already implemented diagnostic imaging tools, new techniques can be applied that provide a more complete capture of myocardial function and structure. Combining these diagnostic measures improves disease classification and enables the detection of 'high-risk' patients who might benefit from more frequent follow-up visits and personalized therapeutic regimens. This approach could lead to a decrease in hospitalization rates and prevent sudden or cardiac death, thereby reducing health care costs and improving the quality of (working) life of these patients.

Target groups

The results presented in this thesis are relevant for patients and physicians, in particular cardiologists that are treating HF and DCM patients. Extending the possibilities of non-invasive imaging tools will optimize the prediction of disease course and prognosis and provide possibilities for personalized follow-up treatment options. Improved risk prediction can also be relevant for targeted drug development companies. Patients who are at high-risk for experiencing adverse clinical events due to, for instance, a high-fibrotic profile might benefit from specific antifibrotic treatment, which can be a development target for drug-developing companies.

Products and innovation

Not all novel imaging techniques described in this thesis are yet fully implemented in the software packages that are currently used in daily practice. The results in this thesis show that the novel techniques are valid and have added value for the risk prediction of DCM-patients. Therefore, they could be implemented in the software packages for clinical use so that physicians also have access to these parameters in clinical practice and not only for research purposes. A multimodality prediction system including clinical features, (non-invasive) imaging parameters and molecular biomarkers is the ultimate goal, but this will take time to get validated and optimized in large, multicenter cohorts before it can be implemented in clinical practice.

Planning, realization, and implementation

As described, the proposed multimodality approach aiming to include atrioventricular imaging of both myocardial function and structure should be further evaluated and validated in larger, (inter)national, multicenter cohorts. Most research in the field of non-invasive imaging and risk prediction is performed in relatively small, single-center cohorts, making it difficult to expand the findings on a wider scale and get them implemented in clinical care. One of the initiatives to improve this is the recently expanded prospective Maastricht Cardiomyopathy Registry, which started as a local initiative to include all subjects that are referred to the cardiology department for HF-like symptoms or cardiac screening for cardiomyopathies. The registry collects patient characteristics, diagnostic measurements performed as part of routine clinical care, treatment information, sequential biobanking, quality of life and economic impact assessments, and regular follow-up data including outcome measures of all included patients (including DCM-patients). Currently, great efforts are being made to expand this registry to a national, multicenter registry, which will improve diagnosis, risk stratification, and management of HF and (early) cardiomyopathy phenotypes.

Besides the national initiatives, international collaborations are also initiated in order to form large consortia. This will enable the collection of clinical data and outcomes and further improve the validation and implementation of results on a larger international scale. This valorization is not yet complete, but, hopefully, these efforts will finally lead to validated multimodality approaches for disease classification and risk prediction of DCM-patients.