Cardiac CT-imaging for the identification of prognostic markers of cardiovascular risk in mentally ill individuals - a SURVIVE PhD study

Gheorghe, Alexandra Gabriella; Jacobsen, Christina; Kofoed, K. F.; Lynnerup, Niels; Banner, Jytte

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Cardiac CT-imaging for the identification of prognostic markers of cardiovascular risk in mentally ill individuals- a SURVIVE PhD study

Gheorghe A.G.[1], Jacobsen C.[1], Kofoed K.F.[2], Lynnerup N.[1], Banner J.[1]

[1]Section of Forensic Pathology, Department of Forensic Medicine, University of Copenhagen
[2]Department of Cardiology, Rigshospitalet

Cardio-vascular disease (CVD) is one of the major causes of morbidity and mortality in the Western World. Mentally ill individuals are a high risk group and have a 20 year reduced life-time expectancy compared to the background population, mainly due to CVD.

Aim

This PhD project will focus on risk of CVD and will provide a detailed characterization of coronary atherosclerosis within the group of mentally ill, who are at risk of dying unexpectedly and prematurely of cardiac events.

Secondly the aim will be to compare the extent of atherosclerosis assessed by Computed Tomography (CT) and CT-Coronary Angiography (CTCA)with pathological findings and to compare them to a normal population, Copenhagen General Population Study-CGPS, which illustrates how CVD develops in a healthy population.

Materials

Individuals with known or suspected mental illness are included in the project (**figure 1**).

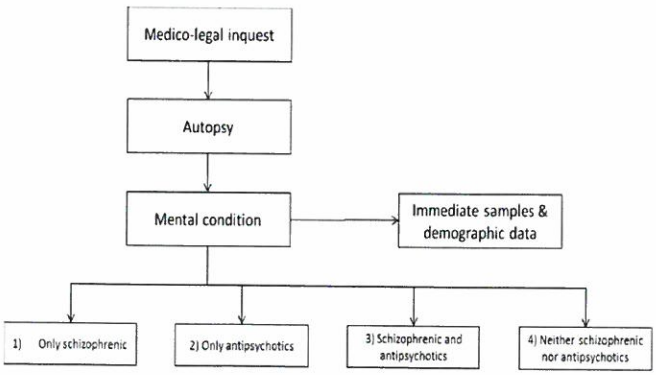


Figure 1: Patient inclusion and division.

For comparison to the SURVIVE cohort, 1500 randomly participants of the CGPS CT-study will be selected in a case-control design by the ratio of 1:3, the two groups being matched by age and gender.

Contact author at: alexandra.gheorghe@sund.ku.dk

Methods

At autopsy the standard CT-scan, a CTCA-scan and an autopsy algorithm with additional data and fluid samples will be applied. The scans will be analyzed with respect to presence of coronary plaques (**figure 3**), degree of stenosis, artery occlusion and calcium-score.

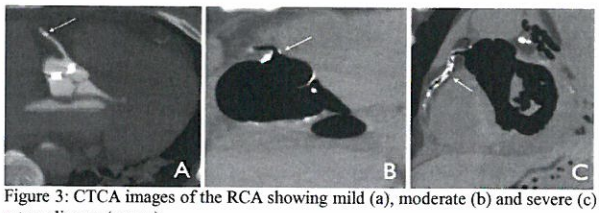


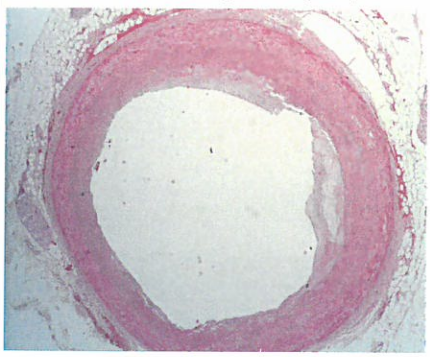
Figure 3: CTCA images of the RCA showing mild (a), moderate (b) and severe (c) coronary artery disease (arrow).

At the autopsy and after, the degree of CVD will be determined histo-pathologically (**figure 4 and 5**) .

Figure 4: Classification.

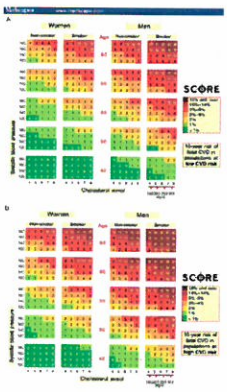
Klassifikation	
Grad	Forandring
0	Ingen
1	Fatty streaks
2	Plaques
3	Plaque m. blødning
4	Forkalkning
5	*Stenose*
	5a: Ingen
	5b: 1-25%
	5c: 26-50%
	5d: 51-75%
	5e: 75-99%
	5f: 100%
6	Trombe

Figure 5: Cross- section of the right coronaty artery.



There will also be a comparison of the known cardiac risk factors (**figure 6**), total coronary calcium mass and results of the CGPS.

Figure 6: Framingham Risk Score Chart



Perspectives

Cause of death and coronary pathology known from autopsy correlated to CT- and CTCA-assessment of coronary atherosclerosis, will allow us to evaluate the prognostic information of a certain amount and type of atherosclerotic plaque measured by CT and CTCA in living patients in risk of CVD.

References:

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