Cardiomatics
The cloud-based ECG analysis company

Cardiomatics for science

Take your research to the next level

Accurate, fast & easy to use ECG analysis

Harness the power of state-of-the-art algorithms and enhance the capabilities and efficiency of your ECG diagnostics.

Basel, Switzerland 2019–2022

NCT02105844

Swiss–AF

Swiss Atrial Fibrillation Cohort Study

Background

Despite the evidence currently available on the association between atrial fibrillation (AF), stroke, and systemic embolism, the underlying mechanisms are still largely unknown. Moreover, therapy increasingly requires personalization and an individual approach to each patient.

Methods

Patients from the SNSF funded Swiss-AF cohort study, an observational multi-center study including 2,415 patients from 14 sites across Switzerland, are included in the Swiss-AF Burden study if they suffer from paroxysmal or persistent AF. Research questions surrounding the current AF burden will be answered using 7-day Holter-ECG recordings and continuous ILR (implantable loop recorders) recording, while cMRI (cardiac magnetic resonance imaging) examination will provide information on cardiac dimensions and function. Cardiomatics is responsible for optimizing the research process and ensuring that the 7-day Holter-ECG analysis is of the highest quality.

Objective

The Swiss AF-Burden study analyzes variations in the frequency and intensity of atrial fibrillation and the impact of these events. The aim of this study is to increase our knowledge of the association between AF burden and changes in AF burden and its health consequences, which are mainly stroke, systemic embolism, and cognitive dysfunction.

Results

The study provided new and unique insights into the relationship between directly measured AF burden and the possibility of stroke. The assessment of AF burden with an AI-based tool provides very similar results compared to manual assessment (Pearson's correlation coefficient: 0.998). The Bland-Altman analysis resulted in a bias of -0.006 (95% limits of agreement -0.042 to 0.030). An AI-based tool may therefore be an accurate and efficient option for the assessment of AF burden.

MD, Prof. Michael Kühne
MD, Head of Clinic Atrial Fibrillation, University Hospital Basel, Switzerland

The web-based platform is very simple and user-friendly. After uploading the raw signal of the ECG, we get access to a detailed report within a few hours. In a clinical routine, this can save a lot of time compared to the time-consuming analysis of Holter recordings with conventional Holter software.

MD, Prof. Christine Meyer-Zürn
University Hospital Basel

Within Swiss-AF Burden, we measure the AF burden manually from a standard 7-day Holter ECG. The medical-grade system which we are using ensures high-quality and trusted outcomes based on accurate algorithms. This helps us to independently validate our results, especially in patients with multiple AF episodes and noisy recordings, where the manual estimation of the AF burden can be challenging.

Coordinating Center

Atrial Fibrillation Clinic
Cardiovascular Research Institute Basel
University Hospital Basel

Universitätsspital Basel

Basel, Switzerland, 2022–2023

NCT04659915

The Gluco-Met Study

Counteracting deleterious metabolic glucocorticoid effects with metformin

Background

Glucocorticoids are widely prescribed due to their immunosuppressive effects. However, metabolic side effects such as weight gain and diabetes mellitus are common. So far, efforts to investigate and prevent these side effects have been lacking. The antidiabetic drug metformin has the potential to help patients avoid these side effects. However, the underlying mechanisms of how metformin counteracts glucocorticoid-induced side effects remain poorly understood.

Methods

In a randomized controlled crossover trial, 18 healthy participants will receive glucocorticoids in combination with metformin or a placebo for seven days. Extensive metabolic phenotyping, including heart rate variability analysis, will be conducted to assess changes in energy homeostasis.

Objective

To investigate how and to what extent metformin prevents the side effects of glucocorticoid treatment.

Results

The Gluco-Met Study will advance our understanding of energy homeostasis during glucocorticoid excess and may help to reduce glucocorticoid-induced side effects in patients requiring glucocorticoid therapy.

Coordinating Center

University of Basel

Universitätsspital Basel

Zagreb, Croatia 2022-2023

AI in the diagnosis of Atrial Fibrillation

AI for increased efficiency in the diagnosis and treatment of atrial fibrillation.

Background

Between 40 and 80 thousand people may suffer from atrial fibrillation (AFib) in Croatia, with more than 20% of them living with undiagnosed or untreated AFib. Long waiting times to see a specialist, as have been noted during the COVID-19 pandemic, are among the reasons for this situation. It is also the case that 24-hour ECG signal recordings are often too short to detect abnormalities in rhythm.

Methods

The study will be based on up to 7 days of remote monitoring of patients. Within its scope will be 80 to 100 patients admitted to the Magdalena Clinic of Cardiovascular Diseases and three general doctor's offices at the Primary Health Care Center in Zagreb. The Magdalena Clinic will onboard two groups of patients: 1) diagnostically naïve patients with a reasonable indication of AFib but no previous diagnosis; 2) patients with a clinical diagnosis of atrial fibrillation and previous successful pulmonary vein isolation ablation; the Primary Health Care Center will only onboard diagnostically naïve patients.

Each patient will be monitored throughout a seven-day period. The collected data will be sent to the cloud and diagnosis will be performed with AI-based software (Cardiomatics) that will create a detailed report for each patient with an indication of a potential diagnosis. If an AF signal is detected in a patient, they will be treated according to the current ESC guidelines for the management of atrial fibrillation, which were developed in 2020.

Objective

The goal of this study is to increase the efficiency of the diagnosis and treatment of AFib by introducing a new AI-based tool into clinical practice.

Results

We anticipate that the combination of SAVVY ECG and Cardiomatics will allow for prolonged monitoring, resulting in a greater chance of arrhythmia being detected. This may positively impact the efficiency of diagnosis and treatment.

Financing party

Bayer

Coordinating Center

Magdalena Clinic
for Cardiovascular Diseases

Copenhagen, Denmark 2020

The ACOVID study

Cardiac arrhythmias in patients hospitalized with COVID-19

Background

Initial reports from the original epicenter of the coronavirus disease 2019 (COVID-19) outbreak in Wuhan, China included case series of the rapid clinical deterioration of seemingly healthy individuals. Based on a cohort of 138 Chinese patients, 16.7% of those with COVID-19 suffered from unspecified arrhythmias despite cardiac biomarkers being within the normal range. In patients admitted to the ICU, arrhythmias were reported in 44.4% of them. However, how the arrhythmias were diagnosed was not clearly specified. Regardless of the pathophysiological pathway of deterioration, of which the proposed mechanisms include myocarditis, depressed cardiac function, worsening of prior cardiovascular disease, and cytokine storm syndrome, one phenotypic presentation may be sudden death and arrhythmias.

Methods

The novel ACOVID-study examined the relationship between COVID-19 and arrhythmias at 6 hospitals in the Greater Copenhagen area. Between 27.04.2020 and 30.07.2020, 117 patients with laboratory-confirmed SARS-CoV-2 infections were screened for arrhythmias using the Cortrium C3 Holter Monitor and Cardiomatics software.

Objective

The "ACOVID" study was intended to provide researchers and clinicians with explanations as to whether coronavirus has any effects on heart activity and if so, what these effects are.

Results

Out of a final group of 54 hospitalized patients,
15 developed major arrhythmias (28%).

The time from referral to diagnosis was reduced from 70 to 22 days, and hospital referrals were avoided in 73% of the cases (Cardiomatics support).

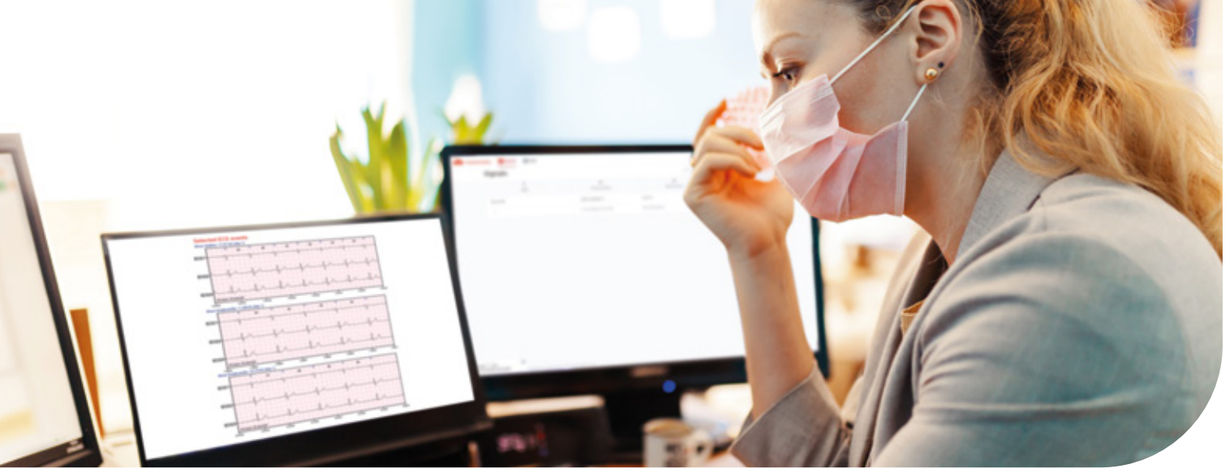
The results of this study will help guide physicians and authorities in the treatment of patients with COVID-19.

Coordinating Center

Bispebjerg and Frederiksberg Hospitals,
University of Copenhagen

Source

www.cortrium.com



Warsaw, Poland 2018–2021

NCT05272722

Increased efficiency in evaluating CRT effectiveness based on AI

An automatic ECG signal analysis system for evaluating the effectiveness of re-synchronization in CRT (cardiac resynchronization therapy)

Background

Cardiovascular disease is the most common cause of death in adult Poles. Over the past 15 years, it has accounted for approximately 45-50% of deaths. One of the main challenges is heart failure. The solution for some patients may be CRT, which involves inserting electrodes into the heart to stimulate both ventricles.

Methods

The research team recorded patients' ECG signals. Then, these records were analyzed by Cardiomatics, and the obtained material served as a training base for the artificial intelligence algorithm. Based on these data, artificial intelligence will help doctors make the right decisions when selecting patients for surgery in the future.

Objective

To create a new and innovative system for the automatic evaluation, analysis, and interpretation of electrocardiographic signals to assess the effectiveness of resynchronization in CRT.

Results

Implementation of artificial intelligence (AI) in the appropriate qualification of patients for CRT resynchronization therapy will help increase the number of people for whom CRT will bring the expected results.

MD, PhD, Prof. Marcin Grabowski
The Medical University of Warsaw

In the project that we are developing together with Cardiomatics, an artificial intelligence algorithm will be used to automatically evaluate ECG recordings in order to assess the effectiveness of CRT therapy in individual patients.

BA, MD, PhD, Associate Professor, Paweł Balsam
The Medical University of Warsaw

Cardiomatics, as a certified medical device that provides fast and reliable reports on ECG tests, perfectly suited the needs of the project team.

Coordinating Center

The Medical University of Warsaw
Central Teaching Clinical Hospital
of the University Clinical Center

Read the peer-reviewed article, published in the Journal of Cardiovascular Development and Disease

Warsaw, Poland 2021–2023

NCT05272722

Cardiomatics Junior

Electrocardiography for the Automatic Analysis of Arrhythmia in Children

Background

There are several tools for automatic ECG signal analysis in adults, but these solutions may not be reasonable/applicable for ECG analyses in the pediatric population, either in children with normal sinus rhythm or those with various kinds of heart rhythm disturbances. This is the result of distinct age-dependent features of the circulatory system such as a strong correlation between morphology, signal amplitude, and age, as well as relevant respiratory sinus arrhythmia and sinus tachycardia.

Methods

The key challenge will be to build algorithms that enable high-quality ECG signal analysis in children. These algorithms will be built using deep neural network architectures, such as ResNet, and will operate on filtered ECG signals. At the same time, the basic method to "train" the algorithm will be to use a database of signals from pediatric patients, which will be created in cooperation with researchers from MUW.

Objective

To develop an innovative tool for automatic analysis of cardiac arrhythmias and conduction in pediatric patients.

Results

The pioneering tool for quick and effective cardiological diagnostics of children will be helpful both in pediatric cardiology and general pediatrics, and even in sports medicine.

MD, PhD, Radosław Pietrzak
The Medical University of Warsaw

The creation of a reliable Cardiomatics system for automatic analysis of ECG recordings using the Holter method in children will not only improve the work of clinicians but also increase the availability and universality of this test, which is of great importance in the detection of rhythm and conduction disorders in pediatrics. Cardiomatics technology will also improve the recognition of these diseases, thanks to which it will be possible to undertake adequate therapy at an earlier stage. In some situations, it could even help to avoid life-threatening arrhythmic events, such as ventricular tachycardia or sudden cardiac arrest e.g., in such conditions as channelopathies.

Coordinating Center

The Medical University of Warsaw

The R&D work will take another 3 years and consume a budget of 5 363 925 PLN. The implementation of the project is possible thanks to the support of the National Center for Research and Development.

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The project is carried out as part of the National Center for Research and Development: Fast Track: "6 / 1.1.1 / 2020 SS Big/MSP/JN 4"

European Funds Smart Growth
Republic of Poland
The National Centre for Research and Development
European Union European Regional Development Fund

Discover Cardiomatics and make your ECG analysis more efficient

Our company

Cardiomatics is a leader in the provision of world class ECG analytics to support cardiac care. Our mission is to bring advanced cardiac diagnostics closer to patients by employing cloud and machine learning.

Our solution

We have created a certified SaaS platform based on artificial intelligence and cloud technology. Cardiomatics can analyze signals recorded in various data formats regardless of the length of the ECG recording and the number of ECG channels.

Agile product development

We provide regular product updates through efficient R&D development cycles

Scientific project's workflow

Cooperation conversation → Trial account → Report overview → Project charter → Signal analysis → Peer–reviewed article

Get your benefits!

Certified state-of-the-art AI algorithm

Get access to the highest analysis quality validated by thousands of satisfied clinicians
(positive feedback rate of 99.9%)

Quick turnaround time

Increase efficiency and save your time
(average 90 minutes)

Hardware agnostic tool for arrhythmia diagnostics

Use one analysis tool for signals from different devices
(compatible with more than 25 common ECG recording devices)

We are compliant to: GDPR, HIPAA, TÜVRheinland CERTIFIED

We are certified by: CE, TGA CERTIFIED, Medicines & Healthcare products Regulatory Agency

Cardiomatics

Let us turn your ECG signals into accurate reports!

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