

examination cohorts since the early 2000s and has more recently established a nationwide biobank network. As a country, Finland offers unique possibilities for genetic research as it is a well-known isolated population where historical bottlenecks resulting from consecutive founder effects have shaped the gene pool of the current population. Population isolates have not only provided insights into population diversity and history but provide better opportunities to identify rare variants with large effect sizes with complex diseases, such as CVD, as compared with more heterogeneous populations. As a result of these distinctive features, the FinnGen study was launched in 2017 as a large public-private partnership aiming to provide novel medically and therapeutically relevant genomic information that can be utilized in future precision healthcare. FinnGen has now collected genome and register-based health data from 500,000 Finnish biobank participants. These data have already been used for assessing the genetic risk of hypertension and for genetic subtyping of hypertension.

In addition to discovery science and risk assessment, Finland is now aiming to provide evidence on the clinical utility of genome data in healthcare. Several implementation and intervention pilot studies that aim to provide patients feedback on their genetic CVD risk are now ongoing. These pilot studies could pave the way for larger, preferably randomized studies on personalized prevention of common chronic diseases to investigate whether the clinical and preventive value of genomic information adds healthy life years for the study participants.

THE CRACOV-HHS STUDY

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The CRACoV in CoVid pandemic - Home, Hospital and Staff (CRACoV-HHS) project has been developed by a team of scientists and clinicians with the aim of optimizing medical care at hospital and ambulatory settings and treatment of patients with SARS-CoV-2 infection in the University Hospital in Krakow. The project was initiated on the beginning of pandemic (April 2020).

Most sub-studies within the project were prospective observations (with data collecting based on pre-specified clinical report files). The retrospective part of the project collected and analyzed data of all hospitalized patients from Hospital Information System (HIS). The results of prospective part of the projects are under analyses. The retrospective analyses of HIS data were performed and published successively.

Firstly we analyzed the association between cardiovascular disease, cardiovascular drug therapy, and in-hospital outcomes in patients with COVID-19 hospitalized till September 2020. Of 1,729 patients overall, in-hospital mortality was 12.9%. Among cardiovascular risk factors and diseases, heart failure (HF) and diabetes mellitus appeared to increase in-hospital COVID-19 mortality, whereas the use of cardiovascular drugs was associated with lower mortality.

In the same group of patients we then analyzed the association between high-sensitivity cardiac troponin T (hs-cTnT) and N-terminal pro-B type natriuretic peptide (NT-proBNP) levels and in hospital mortality, both in patients with and without concomitant chronic HF. The study demonstrated that elevated serum concentration of hs-cTnT (>142 ng/l) and / or NT-proBNP (>969 pg/ml) on admission had a markedly higher risk of in-hospital death than those with lower values.

Next, in the group of 5,191 patients hospitalized due to COVID-19 till May 2021 we showed that the diagnosis of preexisting hypertension (58.3%) per se had no significant impact on in-hospital mortality, however treatment with any first-line blood pressure-lowering drug had a profound beneficial effect on survival.

Finally, we analyzed automatic assessment of COVID-19 pneumonia severity in high resolution computed tomography images by artificial intelligence (AI) technology showing that AI is a simple and valuable approach to predict of COVID-19 pneumonia severity.

THE RATIONALE, PROTOCOL AND PRELIMINARY RESULTS OF THE ESH ABPM COVID-19 STUDY

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The coronavirus disease 2019 (COVID-19) pandemic and the subsequent lockdown profoundly affected almost all aspects of daily life including health services worldwide. The traditional risk factors for increased blood pressure (BP) and hypertension may also demonstrate significant changes during the pandemic.

The ESH ABPM COVID-19 Study aims to determine the impact of the COVID-19 pandemic on BP control and BP phenotypes assessed with ambulatory BP monitoring (ABPM).

This is a multi-center, observational, retrospective and comparative study involving Excellence Centres of the European Society of Hypertension across Europe. Along with clinical data office BP, 24-hour ABPM recordings will be collected in adult patients with treated arterial hypertension. There will be two groups in the study: Group 1 will consist of participants who have undergone two ABPM recordings - the second one occurring during the COVID-19 pandemic, i.e., after March 2020, and the first one 9-15 months prior to the second. Participants in Group 2 will have two repeated ABPM recordings - both performed before the pandemic within similar a 9-15 month interval between the recordings. We will analyze BP variables and phenotypes (including averaged daytime and nighttime BP, BP variability, dipper and non-dipper status, white-coat and masked hypertension) between the two respective ABPM recordings and compare these changes between the groups.

Hypertension is one of the major risk factors for established cardiovascular disease (CVD). By extending our knowledge about effects of COVID-19 pandemic on BP control in patients with hypertension, we can propose appropriately effective strategies for providing adequate medical care in case of new pandemic waves and for long-term care, which will reduce incidence of CVD as a consequence of the current pandemic.

BLOOD PRESSURE REGULATION CHANGE WITH AGEING: IN-DEPTH ANALYSIS OF 1439 SUBJECTS WITH ARTERIAL HYPERTENSION AND AUTONOMIC NEUROPATHY

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Introduction: Blood pressure (BP) regulation is affected by ageing through different mechanisms, including alteration of neural control. Blood pressure variability (BPV) and heart rate variability (HRV) reflect the interaction of BP control mechanisms, and both increased BPV and reduced HRV have been associated to increased cardiovascular morbidity and mortality. The objective of this study was to assess BPV and HRV in hypertensive subjects in different age ranges and to compare them with subjects with established primary cardiovascular dysautonomia, i.e., Parkinson and related diseases.

Methods: The study will include 1,439 subjects, divided in three groups: 777 hypertensive subjects aged 40-55 years, 601 hypertensive subjects

aged 75-95 years, and 61 patients with primary cardiovascular autonomic neuropathy. Short-term BPV will be assessed through standard deviation (SD), weighted standard deviation (wSD), average real variability (ARV), coefficient of variation (CV), and variability independent of mean (VIM) of 24h ambulatory BP monitoring (ABPM). HRV will be evaluated by SD and CV of heart rate measured during ABPM.

Expected outcomes: The expected outcomes of this study include the comparison of overall BPV and mid-term HRV among the three study subgroups, in order to identify similarities and differences in these indexes and to highlight possible common pathophysiological pathways. Furthermore, the characteristics associated with higher BPV and HRV will be analyzed in the three subgroups and compared among them. Similarly, differences in dipping and orthostatic hypotension prevalence will be assessed and characteristics associated with non-dipping status and presence of orthostatic hypotension will be reported. Finally, the association of increased BPV and reduced HRV with organ damage and cardiovascular morbidity will be evaluated.

SOUTH AFRICA – THE AFRICAN-PREDICT STUDY

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The high prevalence of hypertension (one of the main risk factors for cardiovascular disease) in the sub-Saharan African region has been reported, and its management remains a challenge. Although the challenge in controlling hypertension has been attributed to noncompliance with existing guidelines and best practices, lack of evidence-based guidelines, resources and poor access to healthcare; the full understanding of pathophysiology in the development of hypertension may be necessary for effective prevention and treatment strategies in the region. Due to lack of pathophysiologic understanding, the African Prospective study on the Early Detection and Identification of Cardiovascular disease and Hypertension (African-PREDICT) was then initiated to fulfill this need.

African-PREDICT is an ongoing longitudinal study which started in 2013, and is expected to continue for the next 10-20 years. A total of 1,202 young black (n=606) and white (n=596) South African men and women (aged 20-30 years) who were screened to be healthy and clinically normotensive are included in this study. At each data collection phase (baseline and each 5-year follow-up) of the study, detailed measures of health behaviours, cardiovascular profile and organ damage will be taken. In addition, biological sampling for determining novel early markers or predictors will be performed. The research results reported from the African-PREDICT study will contribute to a clear understanding of early cardiovascular disease development in young and healthy black and white individuals.