ACTA CARDIOLOGICA
2024, VOL. 79, NO. S1, 1–32
https://doi.org/10.1080/00015385.2024.2307206

ABSTRACTS

Belgian Society of Cardiology

43rd Annual Congress

8th and 9th February 2024

President: Prof. Bernhard Gerber

Abstracts are identified as follows: Best Abstracts by (#) and abstracts of papers short-listed for the young investigator award by (*). all other accepted abstracts have been invited for poster display: Abstracts will appear in alphabetical order of the first author's last name within the following categories

- Arrhythmias, electrophysiology and devices
- Basic science
- Congenital heart disease and cardiogenomics
- Heart failure and cardiomyopathy
- Invasive and interventional cardiology
- Non-invasive imaging
- Prevention and rehabilitation
- Valvular heart disease
- Vascular diseases, hypertension

ARRHYTHMIAS, ELECTROPHYSIOLOGY AND DEVICES

Left atrial appendage closure in octogenarians: a single centre experience in Belgium (#)

Nicolas de Molinari, Olivier Descamps, Auriane Ceulemans, Riccardo Mancini, Damien Badot, Caroline Lepiece and Antoine de Meester

Centre Hospitalier Universitaire HELORA, Site La Louvière, La Louvière, Belgium

Background/introduction: Atrial fibrillation is the most frequently encountered arrhythmia in clinical practice (prevalence of 2%). This condition increases with age, reaching a prevalence of 17% in subjects over 80 years old. Oral anticoagulation is the standard treatment for thromboembolic prevention. The elderly population is more exposed to both thromboembolic and haemorrhagic risks. In this context, left atrial appendage closure (LAAC) represents a therapeutic alternative to oral anticoagulation.
Purpose: The objective of this study is to identify the benefits of LAAC in elderly patients despite their frailty.
Methods: We conducted a retrospective study that included patients who underwent LAAC in our Hospital between January 2018 and December 2022. The patients were identified from the INAMI database and were stratified by age: younger or older than 80 years. Two atrial exclusion devices were used: Watchman® (Boston scientific) and Amplatzer® (Abbot TM).

More than 15 authors – on behalf of Mitrabel Study Group

Results: Out of our 186 patients encoded during this period in INAMI database, 76 were older than 80 years ('octogenarians'; median age: 86 years) and 109 were younger ('non-octogenarians'; median age: 72 years). The average follow-up duration was 16.3 months ±11.5 in the first group and 17.5 months ±13.9 in the second group. Compared to non-octogenarians, octogenarians had a slightly higher risk of stroke (CHA2DS2-VASc score: 4.8±1.4 vs. 4.4±1.4; $p=0.47$) and bleeding (HAS-BLED score 4.5±1.3 vs. 4.3±1.4; $p=0.54$). Incidence of immediate (0–7 days) post-procedural complications (6/76 [8%] vs. 5/110 [5%]; $p=0.34$) and long-term complications (3/76 [13%] vs. 2/110 [21%]; $p=0.37$) were not different.
Conclusions: Left atrial appendage closure is a safe procedure for all ages, and in particular in elderlies where long-term anticoagulation leads to higher haemorrhagic risk. Our study has some limitations regarding cohort size and the monocentric design. Our geriatric cohort showed also a lower clinical frailty.

QTc interval change in hemodialysis patients as a predictor of fatal arrythmias

Imane Katif, Mohamed Jamili and Mustapha Hattaoui

Department of Cardiology, Marrakech's Mohammed VI University Hospital, Marrakech, Morocco

Background/introduction: It is known that ventricular arrhythmias and sudden cardiac death are exacerbated by QT interval dispersion. The purpose of this study was to determine whether or not chronically hemodialyzed patients' corrected QTc and QTd intervals were affected by HD.
Purpose: In this study, we examined the QT space lengthened further from per in post haemodialysis using a 24-h Holter electrocardiogram (ECG) in the haemodialysis patients and analysed it's association with electrolyts changes and haemodialysis (HD) efficiency.
Methods: We carried out a study in the haemodialysis units of Marrakech's Mohammed VI University Hospital, Morocco, over a 6-month period in 2020, we consecutively recruited consenting adult patients on maintenance haemodialysis for at least 3 months. A 24-h Holter ECG monitor was placed just before dialysis. After the examination of 24-h Holter ECG, especially QT intervals and QTc with clinical characteristics and biochemical data was analysed in order to investigate the QT variations and its association with electrolytes changes
Results: 56 patients (51% female and 46% male) were analysed in this study. The corrected QT space was calculated by the BAZETT formula, based on the results of the study; the QT space lengthened further from per in post haemodialysis. The lengthening in QTc duration from pre-dialysis to per and post-dialysis and variations in kalemia, calcemia, phosphoremia, CRP, and bicarbonate level was significant
Conclusions: The lengthening in Qtc duration is a reliable and easy tool to inform us on the patient electrolyte status.

Effectiveness of left bundle branch area pacing to restore narrow QRS in patients with right bundle branch block

Judith Küpper, Sibille Lejeune, Quentin Garnir and Aurélien Wauters

Clinique Saint-Pierre, Ottignies, Belgium

Background/introduction: Left bundle branch area pacing (LBBaP) is an innovative technique used to capture conduction tissue and maintain ventricular synchrony during pacing.
There are few data about the efficacy of LBBaP in right bundle branch block (RBBB).
Purpose: To compare the response to LBBaP, evaluated by the change in QRS duration (QRSd) after pacing, in patients with RBBB, left bundle branch block (LBBB) or without conduction disorder.
Methods: A total of 162 patients with pacemaker indication underwent LBBaP with stylet driven lead with dedicated sheaths, between November 2020 and April 2023. ECG characteristics were evaluated. Data are presented in mean±standard deviation (SD) or *n* (%). Paired sample t-test was used to compare QRSd before and after pacing.
Results: Indications for pacing were atrioventricular block (AVB) 48.4%, sinus node dysfunction (SND) 37.7%, AVB and SND 10.7% and cardiac resynchronisation therapy 3.1%. LBBaP was successfully performed in 98% (159/162) of patients (78±10 years, 62% male). Overall, baseline QRSd was 113.2±26.7 ms and paced QRSd was 112.3±14.8 ms ($p=0.662$), with left ventricular activation time (LVAT) of 69±14 ms (Table 1).

Baseline ECG showed 18 LBBB, 29 RBBB and 11 undetermined conduction disorder. In every kind of conduction disorder, paced QRSd was reduced to <120 ms (Table 2).
Notably, paced QRSd was <120 ms, regardless of baseline QRSd. In patients with most important pre-existing conduction disorder (QRS ≥145 ms), an impressive reduction in QRSd was observed (Delta = −40.8 ms, Table 1).

Table 1. QRS duration (ms) before and after LBBaP.

	QRSd baseline	QRSd LBBaP	Delta	*p*
All patients (*n* = 159)	113.2 ± 26.7	112.3 ± 14.7	0.94 ± 27.0	0.662
QRSd <120 ms (*n* = 101)	95.6 ± 11.4	111.2 ± 15.6	15.6 ± 16.0	<0.001
QRSd 120–129 ms (*n* = 13)	124.1 ± 2.8	108.4 ± 12.7	−15.7 ± 12.6	<0.001
QRSd 130–144 ms (*n* = 21)	136.7 ± 4.3	112.7 ± 12.5	−23.9 ± 11.6	<0.001
QRSd ≥145 ms (*n* = 24)	159.6 ± 12.7	118.8 ± 12.3	−40.8 ± 15.5	<0.001

Table 2. QRS duration (ms) before and after LBBaP in patients with RBBB or LBBB or undetermined conduction disorder.

	QRSd baseline	QRSd LBBaP	Delta	*p*
QRSd ≥ 120 ms (*n* = 58)	143.3 ± 16.9	113.9 ± 12.9	29.4 ± 16.5	<0.001
LBBB (*n* = 18)	149.6 ± 18.0	119.4 ± 10.1	30.2 ± 14.1	<0.001
RBBB (*n* = 29)	137.3 ± 11.7	111.9 ± 14.2	25.4 ± 12.2	<0.001
Undetermined conduction disorder (*n* = 11)	148.9 ± 22.4	110.3 ± 11.6	38.6 ± 25.7	<0.001

Figure 1. Evolution of QRS duration after LBBaP in patients with preexisting right bundle branch block

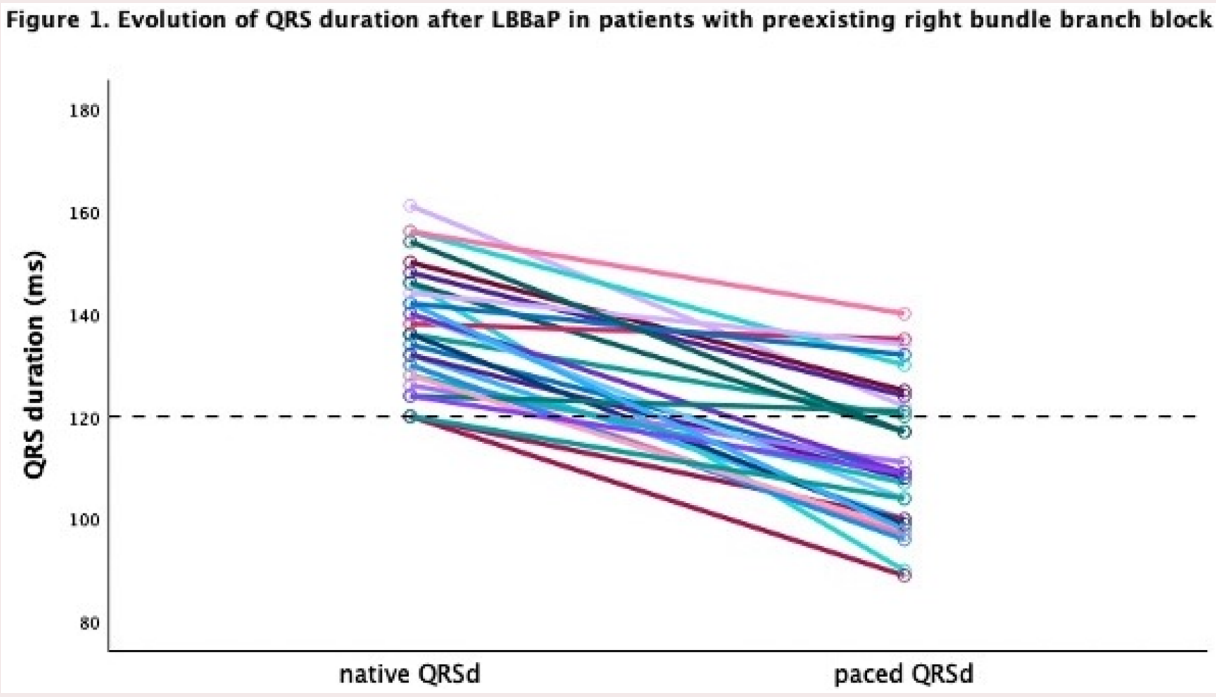


Figure 1. Evolution of QRS duration after LBBaP in patients with pre-existing right bundle branch block.

Conclusions: LBBaP with stylet driven lead is an effective approach to obtain short paced QRS regardless of baseline QRSd and of the nature of the initial conduction disorder. This opens new perspectives for cardiac resynchronisation in patients with RBBB.

Is atrial fibrillation ablation suitable in our most fragile elderly patients?

Margaux Lange, Antoine de Meester, Damien Badot, Olivier Descamps, Pierre Hanotier and Caroline Lepièce

Centres Hospitaliers Universitaires Helora, La Louvière, Belgium

Background/introduction: Studies have shown the superiority of atrial fibrillation (AF) ablation over drug treatment in maintaining sinus rhythm. However, therapeutic strategy in the elderly is unclear.
Purpose: The aim of this study is to determine the benefits and risks of AF ablation in people over 75, according to their clinical frailty score.

Methods: In this retrospective study, we included patients over 75 who underwent primary AF ablation between 1 January 2020 and 31 December 2022 in our hospital. A clinical frailty score (CFS) was determined for each patient based on telephone contact or electronic records. The endpoints include the recurrence rate of AF, acute complication rate of the procedure, quality of life benefits, rate of rehospitalization for heart failure or AF and long-term need of anti-arrhythmic therapy.
Results: A total of 53 patients (78.6 ± 3.1 years; 56% men) underwent primary AF ablation procedure. Respectively 53% and 47% were classified as not frail (CFS 1 to 3) and slightly to severely frail (CFS 4 to 9). Between the two groups, CHA2DS2-VASC2score was statistically different (4.0 ± 0.9 versus 4.9 ± 1.3; $p < 0.01$), as well as hospitalisations within 2 years (7% vs 60%, $p < 0.01$). Recurrence rates were similar in all two groups (26% vs 30%; p = NS), as were the rates of acute complications (11% vs 12%; p = NS), rehospitalizations for heart failure or AF (4% vs 16%; p = NS) and all-cause mortality (0% vs 8%; p = NS). Non-fragile patients reported a higher rate of improvement in quality of life (96% vs 62%; $p < 0.01$).
Conclusions: AF ablation is effective and safe in fragile and non-fragile elderly patients with similar outcomes regarding recurrence, procedure complications, rehospitalization and mortality during this short follow-up. However, the benefits in terms of life quality appeared greater in non-fragile patients in comparison to fragile patients.

The quality of life of patients with permanent symptomatic atrial fibrillation at the time of atrioventricular node ablation and cardiac resynchronisation therapy

Victoria Mond, Olivier S. Descamps, Caroline Lepièce, Damien Badot and Antoine de Meester

HELORA, La Louvière, Belgium

Background/introduction: Atrial fibrillation (AF) is the most common arrhythmia, complicated of high morbi-mortality. Multiple therapies are available, from pharmaceutical drugs to more invasive procedures. Atrioventricular node ablation (AVNA) combined with pacemaker/defibrillator insertion offers a viable alternative for effective rate control.
Purpose: This study aims to determine whether cardiac resynchronisation therapy (CRT) following AVNA improves quality of life and left ventricular function, and also prevents tachycardiomyopathy and rehospitalizations for congestive heart failure (CHF).
Methods: A retrospective study in all patients who underwent AVNA following implantation of a cardiac device between 01/2016 and 12/2022 in our single Belgian hospital. There was no exclusion criterion. Endpoints were improvement of quality of life at short- and long-term follow-up, as well as left ventricular function and prevention of rehospitalization for CHF.
Results: Among the 65 patients (74 ± 9.6 years; 57% men), 97% had a CHA2DS2-VASc score ≥2 and 34 (52%) had a history of CHF. The procedure was performed successfully in 94% of cases, despite minor acute complications occurring in 9% of cases (hematoma, pulmonary edoema, contrast-induced nephropathy). Quality of life improved for 73% of the population on the short term (less than 2 months) and 59% on the longer-term (2.9 ± 1.9 years). This improvement was also confirmed by a decrease or stabilisation in NYHA class in 81% of cases and increase or stabilisation of left ventricular ejection fraction (LVEF) in 79% of cases on the long term. However, during the follow-up, there were 41% rehospitalisation for heart failure mainly older patients and 45% mortality, including 18% of MACE death.
Conclusions: CRT following AVNA for symptomatic permanent AF improves long-term quality of life, NYHA class and LVEF in the majority of patients. Rehospitalization and mortality rates should be compared with a similar group of patients with symptomatic permanent AF who did not undergo CRT implantation.

BASIC SCIENCE

Impact of the European Society of Cardiology low-risk country SCORE2 on atherosclerotic cardiovascular disease risk estimation in abdominally obese patients in Belgium (#)

Sarah Douhard[a], Marc Snel[b], Luc Van Gaal[c], Christian Brohet[d], André Scheen[e], Fabian Demeure[f] and Olivier S. Descamps[b]

[a]Cliniques Universitaires Saint-Luc, Brussels, Belgium; [b]Pôle Hospitalier Jolimont, La Louvière, Belgium; [c]UAntwerp, Antwerp, Belgium; [d]UCLouvain, Brussels, Belgium; [e]ULiège, Liège, Belgium; [f]CHU UCL Namur, Namur, Belgium

Background/introduction: In Belgium, atherosclerotic cardiovascular disease (ASCVD) risk estimation for primary prevention initially followed ESC 2003 guidelines using the SCORE chart, adapted in 2012 with HDL-C weighting. In 2021, the ESC introduced SCORE2, which sorted the population into three risk categories and considered non-HDL-cholesterol instead of total cholesterol.
Purpose: This study assesses SCORE2's implications on ASCVD risk in belgian patients with abdominal obesity, comparing it to the 2012-HDL-C SCORE. The purpose was to determine the possible shift in risk categorizations between the two methods and understand which patient profiles were most susceptible to reclassification, thereby emphasising the relevance of re-evaluating cardiovascular risk.
Methods: This study, builded on data from the Belgian 2004 'BEST study', estimated ASCVD risk in 5773 individuals (40–75 years) with abdominal obesity (≥80 cm in women, ≥94 cm in men) with no prior ASCVD. Patients with diabetes and lipid-lowering treatments were excluded. The analysis compared risk categorisation using the 2012 SCORE-HDL-C and the 2021 SCORE2.
Results: Compared to the 2012 SCORE-HDL-C, SCORE2 demonstrated that 27% of the 2177 women and 48% of 1747 men with low/moderate risk shifted to high-risk category. This was due to SCORE2's reclassification based upon age cut-offs. When limiting analysis to 50–69 years old, which accounted for majority, and where risk cut-offs are similar for both charts, numbers were higher: 36% of the 1496 women and 70% of 888 men. Strikingly, individuals with classical risk factors mainly drove this shift, not those with metabolic syndrome-associated factors (except high blood pressure). This absence of correlation may indicate that the known contribution of abdominal obesity to ASCVD risk is not fully captured by the SCORE2 guidelines as they currently stand.
Conclusions: In patients with increased waist circumference, SCORE2 identifies a high proportion of patients shifting from the low/moderate ASCVD risk to high-risk, compared to the 2012 SCORE-HDL-C.

Early renal abnormalities in experimental HFpEF associated with multiple comorbidities (#)

Umair Sheikh Mohammad[a], Géraldine Hubesch[a], Marie Van Eycken[b], Sandrine Rorive[b], Joëlle Nortier[c], Grégory Vegh[a], Emeline Hupkens[a], Pascale Jespers[a], Kathleen McEntee[a], Jean-Luc Vachiéry[d], Céline Dewachter[a] and Laurence Dewachter[a]

[a]Laboratory of Physiology and Pharmacology, Brussels, Belgium; [b]Centre Universitaire inter Régional d'expertise en Anatomie Pathologique Hospitalière, Jumet, Belgium; [c]Department of Nephrology, CHU-Brugmann, Brussels, Belgium; [d]Department of Cardiology, HUB - Erasme Hospital, Brussels, Belgium

Background/introduction: Heart failure with preserved ejection fraction (HFpEF) is a growing cardiovascular epidemic, accounting for almost half of all prevalent heart failure cases worldwide. In HFpEF, renal dysfunction is frequent and associated with increased mortality. Pathomechanisms linking HFpEF and chronic kidney disease, which may present a bidirectionally causal relationship, remain largely unknown.
Purpose: We investigated the time course of renal abnormalities in an experimental rat model of HFpEF associated with multiple comorbidities.
Methods: Obesity-prone (OP) and -resistant rats were respectively fed with a high-fat diet (HFD) or standard rat chow for 4 or 12 months ($n=10$ rats/group) and evaluated by echocardiography, cardiac catheterisation, renal histological and pathobiological analyses.
Results: After 12-month HFD, OP rats developed HFpEF characterised by LV diastolic dysfunction [assessed by increased left ventricular (LV) end-diastolic pressure] associated with concentric LV hypertrophy and fibrosis, with preserved LV ejection fraction, whereas it was not observed after 4-month HFD. Serum levels of cystatin C and renal expression of the kidney injury molecule(KIM)-1 were both increased in HFpEF rats, indicating renal dysfunction. Histological analysis showed already in 4-month HFD-fed OP rats and even much more in HFpEF rats, glomerular enlargement and sclerosis, as well as inflammatory infiltrates in glomerular and tubular structures, associated with increased renal expression of inflammatory markers, including vascular and intercellular adhesion molecules and macrophage-specific marker CD68. Pro-inflammatory cytokines (interleukin-1β, −6 and tumour necrosis factor-alpha) were also upregulated in HFpEF kidneys. Renal apoptosis (assessed by increased pro-apoptotic Bax/Bcl2 ratio and TUNEL staining) was observed in HFpEF rats, as well as sustained fibrosis (assessed by PicroSirius Red and Mason's trichrome staining). This was associated with increased expression of matrix components (collagen-1a1, -3a1, and fibronectin1) and of pro-fibrotic factors (transforming growth factors-beta1 and 2).
Conclusions: Renal pathological changes were objectivated prior the diagnosis of HFpEF in our experimental rat model of HFpEF.

European practices on antithrombotic management during percutaneous mechanical circulatory support in adults: an international survey of the Association for acute CardioVascular Care (ACVC) of the European Society of Cardiology (ESC) joint with the European branch of the Extracorporeal life support Organisation (EuroELSO)

Charlotte Van Edom[a,b], Thomas Castelein[c], Mario Gramegna[d], Kurt Huber[e], Sergio Leonardi[f], Thomas Mueller[g], Federico Pappalardo[h], Susanna Price[i], Hannah Schaubroeck[j], Benedikt Schrage[k], Justyna Swol[l], Guido Tavazzi[m,n], Leen Vercaemst[o], Pascal Vranckx[p] and Christophe Vandenbriele[i]

[a]Department of Cardiovascular Diseases, University Hospitals Leuven, Leuven, Belgium; [b]Department of Cardiovascular Sciences, University of Leuven, Leuven, Belgium; [c]Cardiovascular Centre, Onze-Lieve-Vrouwziekenhuis, Aalst, Belgium; [d]Cardiac Intensive Care Unit, IRCCS San Raffaele Scientific Institute, Milan, Italy; [e]3rd Department of Medicine, Cardiology and Intensive Care Medicine, Wilhelminenhospital and Sigmund Freud University, Medical Faculty, Vienna, Austria; [f]Department of Medical Sciences and Infective Disease, University of Pavia and Fondazione, IRCCS Policlinico San Matteo, Pavia, Italy; [g]Department of Internal Medicine II, University Hospital Regensburg, Regensburg, Germany; [h]Department of Anaesthesia and Intensive Care, Azienda Ospedaliera SS. Antonio e Biagio e Cesare Arrigo, Alessandria, Italy; [i]Department of Critical Care, Royal Brompton and Harefield Hospitals, Guy's and St Thomas' NHS Foundation Trust, London, United Kingdom; [j]Department of Intensive Care Medicine, Ghent University Hospital, Ghent University, Ghent, Belgium; [k]Department of Cardiology, University Heart and Vascular Centre Hamburg, Hamburg, Germany; [l]Department of Respiratory Medicine, Paracelsus Medical University Nuremberg, Nuremberg, Germany; [m]Department of Clinical-Surgical, Diagnostic and Paediatric Sciences, University of Pavia, Pavia, Italy; [n]Intensive Care Unit, Fondazione Policlinico San Matteo IRCCS, Pavia, Italy; [o]Department of Perfusion, University Hospitals Leuven, Leuven, Belgium; [p]Department of Cardiology and Critical Care Medicine, Hartcentrum Hasselt, Jessa Ziekenhuis, and the Faculty of Medicine and Life Sciences, Hasselt University, Hasselt, Belgium

Background/introduction: Bleeding and thrombotic complications impair the outcomes of patients on percutaneous mechanical circulatory support (pMCS) with veno-arterial extracorporeal membrane oxygenation (V-A ECMO) and/or microaxial flow pumps such as the Impella™. Evidently, antithrombotic practices are an important determinant of the coagulopathic risk, but guidelines are non-existing.

Purpose: An overview of the current European practices in antithrombotic management in adults on pMCS is a first step to design trials, standardise practice and improve outcome.

Methods: This online cross-sectional survey was distributed *via* a digital newsletter and social media platforms through the Association of Acute Cardiovascular Care (ACVC) and the European chapter of the Extracorporeal Life Support Organisation (EuroELSO). The survey was accessible between 17 April 2023 and 23 May 2023. The target population were European clinicians involved in adult critical care and pMCS.

Results: We included responses from 105 different departments in 26 European countries. 72.4% Of the responders have an institutional anticoagulation protocol. Typical thresholds for the administration of blood products without acute bleeding as indication vary substantially among centres. Heparin is the predominantly used anticoagulant (Impella™:97.0% and V-A ECMO:96.1%). 10.8% And 14.5% of the monitoring protocols rely on anti-factor-Xa assay with activated partial thromboplastin time (APTT) in parallel for Impella™ and V-A ECMO, respectively. Up to 43.1% (Impella™) and 32.9% (V-A ECMO) of the respondents rely on a monitoring strategy with APTT alone. Anticoagulant targets vary between institutions. 54.0% and 42.7% of the survey participants administer dual antiplatelets during Impella™ and V-A ECMO support after acute coronary syndrome without percutaneous coronary intervention (PCI), increasing to 93.7% and 84.0% after recent PCI, respectively.

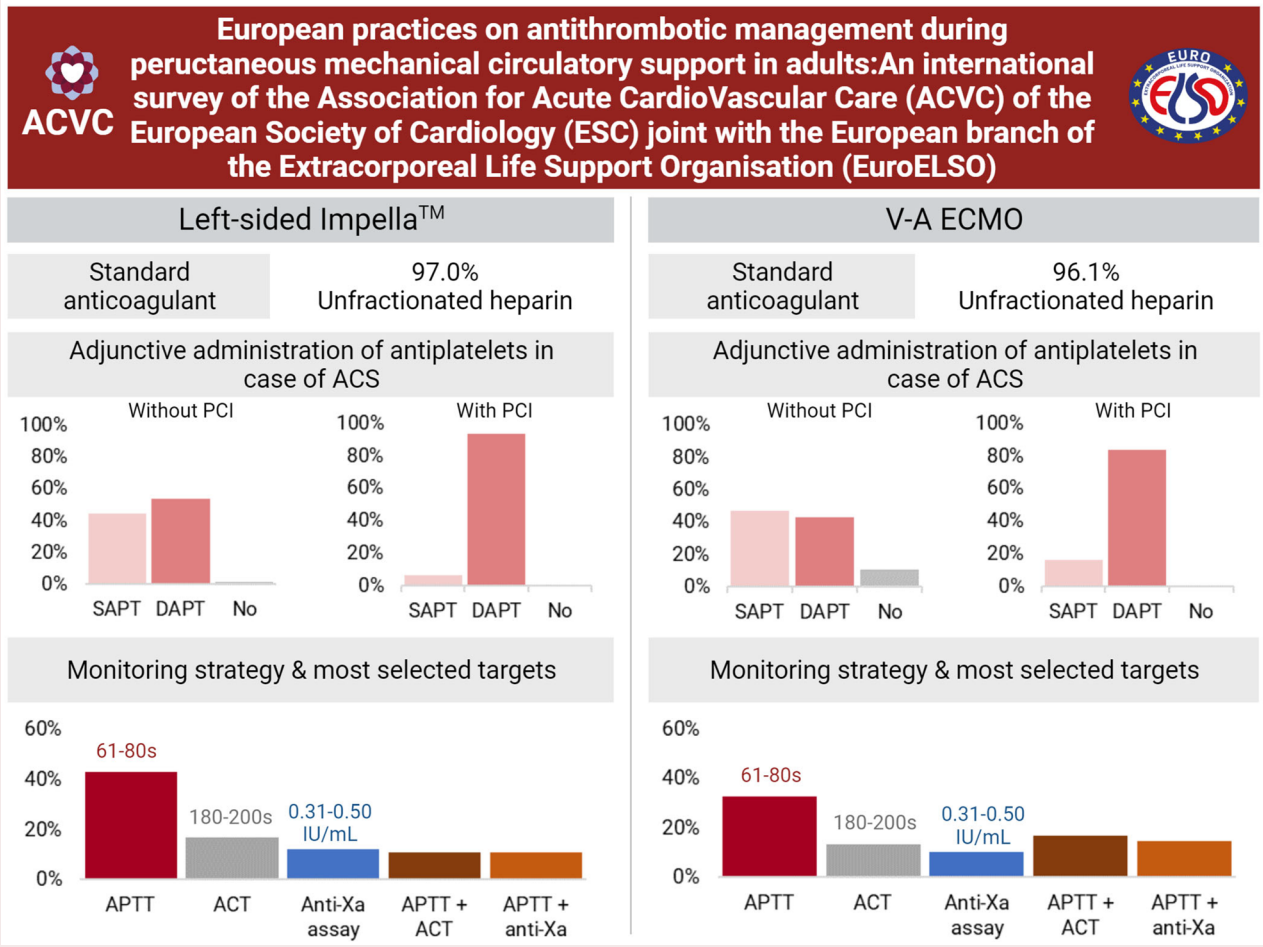


Figure 1. (A) 5-Year risk of unadjusted all-cause mortality stratified by atrial rhythm and AVR status a 5-year adjusted risk of all-cause mortality with time-dep. AVR.

Conclusions: Large heterogeneity in antithrombotic practices is observed across the responses in the present European survey. This survey underpins the importance of prospective trials investigating basic questions on antithrombotic strategies in order to implement a more standardised approach and reduce mortality in this patient population.

Loss of transcription factor Prdm16 in cardiomyocytes triggers an identity switch from ventricular towards more atrial and conduction cardiomyocytes

Jore Van Wauwe[a], Samaneh Ekhteraei-Tousi[a], Sander Craps[a], Rosa Doñate Puertas[b], H. Llewelyn Roderick[a], Manu Beerens[c] and Aernout Luttun[a]

[a]KU Leuven, Leuven, Belgium; [b]Université Paris-Saclay, Paris, France; [c]UKE Hamburg, Hamburg, Germany

Background/introduction: Prdm16 is a transcription factor expressed in ventricular but not atrial cardiomyocytes and its expression declines postnatally. Mutations in humans lead to cardiac defects and conduction abnormalities. Since Prdm16 is mostly known for its role in binary cell fate decisions in various tissues, we hypothesised a similar decision-making role in cardiomyocytes during cardiac development.
Purpose: This study will lead to important advances in in our understanding of Prdm16's role in cardiac development and disease.
Methods: We generated a conditional mouse model (Prdm16^{cKO}) by intercrossing mice with two floxed Prdm16 exon9 alleles with the Sm22a-Cre driver strain active in cardiomyocyte (progenitors) between embryonic day (E)8 and E12.5, during the onset of ventricular wall development. Next, we performed combined single-cell RNA and ATAC sequencing of left ventricles at 1 week of age (P7) to look at transcriptional and epigenetic changes.

Results: At P7, Prdm16^{cKO} pups showed a reduced ejection fraction, an abnormal electrocardiogram, cardiac fibrosis and reduced myocardial wall thickness. Moreover, between 1 and 5 weeks of age, 60% of the Prdm16^{cKO} mice died due to severe cardiac defects. Cardiac dysfunction progressively worsened in the surviving Prdm16^{cKO} mice at 8 and 16 weeks of age. In depth phenotyping at P7 by single-cell sequencing revealed a downregulation of ventricular working cardiomyocyte genes and an upregulation of atrial and ventricular conduction genes. Histological analysis confirmed an expansion of the ventricular conduction system based on expression of Contactin2, a Purkinje cell marker. ATAC-sequencing revealed an increase in differentially accessible regions in Prdm16^{cKO} hearts, suggesting that Prdm16 promotes ventricular working identity by repressing atrial and ventricular conduction gene expression.
Conclusions: Prdm16 has an indispensable role during cardiac development and its loss switched the cell fate of ventricular (working) cardiomyocytes towards a more atrial-like and conduction-like identity. This abnormal cardiac development caused poor cardiac function leading to postnatal mortality.

CONGENITAL HEART DISEASE AND CARDIOGENOMICS

Evaluation of transition with a heart, a multi-component transition program for adolescents with congenital heart disease (#)

Michèle de Hosson[a], Katya De Groote[a], Ann Van Hecke[b], Daniël De Wolf[a], Kristof Vandekerckhove[a], Laura Muiño Mosquera[a], Joseph Panzer[a], Karen Logghe[a], Saskia Mels[a], Laurent Demulier[a], Laurence Campens[a], Eva Goossens[c] and Julie De Backer[a]

[a]Ghent University Hosptial, Ghent, Belgium; [b]Ghent University, Ghent, Belgium; [c]University of Antwerp, Antwerp, Belgium

Background/introduction: Safeguarding lifelong medical follow-up and well-being in adolescents with congenital heart disease (CHD) and their parents requires thorough guidance during transition. Multi-component transition programs (TP), including self-management training and disease-related information, are therefore recommended despite their limited evidence.
Purpose: To bridge the still-existing knowledge gaps, the Paediatric Cardiology and Adult Congenital Heart Disease departments of Ghent University Hospital developed, implemented and evaluated a multi-component TP named 'Transition With a Heart' (TWAH). This study aimed to assess TWAH's effectiveness on disease-related knowledge as the primary outcome, health-related quality of life (HR-QoL), transition experiences, and gaps in follow-up.
Methods: An evaluation study with a pre-post test design and control group (post-transition only) was performed using consecutive sampling. Adolescents aged ≥12 years with moderate to severely complex CHD, without intellectual disability, as well as their parents were included. After applying inverse probability treatment weighting, t-tests were performed as pre-posttests and as a comparison between the intervention and control groups (post-test only). A multivariable regression analysis explored the determinants of the outcomes.
Results: In total, 28 adolescents and 25 parents were included in the intervention group, and 53 adolescents and 18 parents as controls. Disease-related knowledge of adolescents in the intervention group significantly increased from baseline to TWAH completion ($p < 0.01$) and was significantly higher in the intervention group post-transition compared to the control group. Adolescentś knowledge was mainly related to whether or not they participated in TWAH ($\beta = +13.3$; $p < 0.01$). Adolescents' transition experiences were also primarily related to whether or not participating in TWAH with better experiences ($\beta = +5.5$; $p < 0.01$) and higher transfer satisfaction ($\beta = +0.8$; $p < 0.01$) in the intervention group. Adolescents and parents of both groups expressed great confidence in the paediatric and adult cardiologists.
Conclusions: Implementing TWAH substantially improved adolescents' disease-related knowledge and transition experiences. These improvements may support them in transitioning and transferring to adult care.

HEART FAILURE AND CARDIOMYOPATHY

Cardiac amyloidosis: characteristics and prognostic factors of a Belgian cohort

Kenza Bennis, Vincent Hanet, Justine Vereeke, Agnès Pasquet, David Vancaeynest, Olivier Gheysens, Bernhard Gerber, Marie-Christiane Vekemans and Anne-Catherine Pouleur

Cliniques Universitaires Saint-Luc, Brussels, Belgium

Background/introduction: Amyloidosis involves insoluble amyloid fibrils, typically light chain immunoglobulin (AL) or transthyretin (TTR), impacting multiple systems. Both cardiac amyloidosis (CA) types share some clinical and imaging

features but exhibit substantial variations in course, prognosis, and treatment explained by their specific aetiology and pathophysiology.
Purpose: The aim of this study is to compare the clinical, laboratory, and imaging characteristics of a Belgian cohort with TTR and AL cardiac amyloidosis, and evaluating the factors influencing their prognosis.
Methods: This retrospective single-centre study evaluates clinical, laboratory, echocardiographic, and cardiac magnetic resonnance imaging characteristics of AL and ATTR cardiac amyloidosis patients diagnosed at Cliniques Universitaires Saint-Luc (Brussels) between March 2006 and September 2022.
Results: A total of 78 patients (21% females) were included, with 33 (42%) AL-CA and 45 (58%) ATTR-CA. Patients with ATTR-CA were older (78 [72–83] years old, $p<0.001$), had a higher prevalence of atrial fibrillation (38 vs 6%, $p=0.003$), a higher myocardial mass index (143 ± 41 vs 117 ± 41 g/m^2, $p=0.009$) and a lower global longitudinal strain (−13 ± 6 vs −17 ± 6, $p=0.040$). Over an average follow-up of 24 ± 21 months, 37 patients (47%) died, and 46 patients (59%) reached the combined endpoint of mortality and/or HF hospitalisation. In multivariate Cox regression, NYHA functionnal class (HR =2.9 for III/IV, $p=0.001$) and AL type (HR =3.9, $p=0.002$) independently predicted mortality and New York Heart Association (NYHA) functional class (HR =2.5 for III/IV, $p=0.041$), elevated E/A ratio (HR =1.9, $p=0.012$), and increased left atrial diameter (HR =1.1 pr mm, $p=0.033$) independently predicted the combined endpoint.
Conclusions: Despite younger age and a less advanced myocardial disease, AL-CA patients have higher mortality independently from NYHA functionnal class. Simple clinical parameters like NYHA functionnal class and imaging parameters reflecting diastolic dysfunction were powerful prognostic factors allowing for risk stratification of patients with cardiac amyloidosis.

Dynamics of SerpinA3 in response to anthracycline treatment and cardiovascular dysfunction (*)

Hanne M. Boen[a,b], Inge Goovaerts[b], Bert Ectors[b], Tibor Stoop[b], Lobke Pype[a,b], Leen Delrue[c], Ward Heggermont[c], Matthias Bosman[a], Pieter-Jan Guns[a], Nicole Sturkenboom[a,b], Andreas Gevaert[a,b], Caroline Van, De Heyning[a,b], Constantijn Franssen[a,b] and Emeline M. Van Craenenbroeck[a,b]

[a]GENCOR, University of Antwerp, Antwerp, Belgium; [b]Cardiology Department, University Hospital Antwerp, Antwerp, Belgium; [c]Cardiology Department, OLV Hospital Aalst, Aalst, Belgium

Background/introduction: SerpinA3 recently emerged as prognostic biomarker in heart failure and ischaemic heart disease. SerpinA3 possibly reflects pathophysiological mechanisms more than common cardiac biomarkers. It works as a protease, involved in inflammatory responses and has proliferative properties, which makes it an interesting actor in the dynamics between the heart and cancer.
Purpose: We aimed to assess the dynamics of circulating SerpinA3 levels in a cancer population treated with anthracycline chemotherapy and its relation with cancer therapy-related cardiac dysfunction (CTRCD).
Methods: In this single centre cohort study, cancer patients scheduled for anthracycline (AC) chemotherapy were prospectively enrolled between 01/2020 and 12/2022. Cardiac evaluation (echocardiography, troponins and NT-proBNP) was performed and circulating Serpin A3 values were assessed before chemotherapy (V1), directly after the end of chemotherapy (V2), 3 months after (V3) and 12 months after chemotherapy (V4).
Results: During follow-up, 42 out of 55 patients (76.4%) developed CTRCD, of whom 32 mild and 10 moderate CTRCD. Overall, median SerpinA3 levels decreased from baseline (V1) to 3 months (V3) after AC chemotherapy (215.7 [62.0–984.0] to 176.9 [94.7–678.0] µg/ml, $p=0.031$). This median decrease was most prominent in patients without CTRCD (30.8% decrease, $p=0.007$), followed by mild CTRCD (9.0% decrease, $p=0.022$), while patients with moderate CTRCD did not show a reduction in SerpinA3 (5.1% increase, $p=0.987$). SerpinA3 values at V3 positively correlated with NT-proBNP ($r=0.47$, $p=0.002$). As expected, due to its role in inflammation and proliferation, several malignancy and patient characteristics as well as C-reactive protein, an inflammatory marker were predictive for elevated SerpinA3 values.
Conclusions: Circulating SerpinA3 levels show a dynamic course in a cancer population, with an overall decrease following chemotherapy. However, in patients who concomitantly develop moderate CTRCD, SerpinA3 remains elevated. SerpinA3 values are positively correlated with NT-proBNP and C-reactive protein, indicating it might serve as a promising biomarker reflecting pathophysiological mechanisms for CTRCD.

Ten year evolution of clinical characteristics and short-term outcome of patients admitted with heart failure

Daniel Borsboom[a,b], Delphine Vervloet[b], Barbara Vande Kerckhove[b], Anne-Marie Willems[b], Lynn van Calster[b], Pieter-Jan De Sutter[a] and Johan De Sutter[a,b]

[a]Ghent University, Ghent, Belgium; [b]AZ Maria Middelares, Ghent, Belgium

Background/introduction: Heart failure (HF) continues to be a leading cause of morbidity, decreased quality of life (QoL) and mortality worldwide. Contributing to decreased QoL is the high rehospitalization rate. Detailed clinical and outcome data for HF admissions in Belgium over time are only scarcely available.
Purpose: We aimed to evaluate and compare two groups of patients admitted with HF ten years apart, regarding clinical characteristics, comorbidities, use of HF medication and devices, as well as rehospitalization rate and all-cause mortality 3 months post-discharge.
Methods: This is a monocentric retrospective observational cohort study conducted in Belgium. Two groups of patients admitted for acute decompensated HF who were discharged alive were included and compared: 340 patients during 2011–2012 and 319 patients during 2021–2022.
Results: The two cohorts did not differ significantly regarding age, gender, number of patients with HF with reduced ejection fraction or comorbidities. In the latest cohort, 29% of HFrEF patients were prescribed SGLT-2 inhibitors and 13% sacubitril/valsartan. Mineralocorticoid receptor antagonists were used significantly more frequently. However, there was no change in administration of beta-blockers or RAAS-antagonists. The use of implantable devices doubled. In-hospital length of stay decreased significantly over a ten-year period across all ejection fraction subgroups from 7 to 5 days. The combined outcome of rehospitalization for HF and all-cause mortality 3 months post-discharge remained constant at approximately 20%.

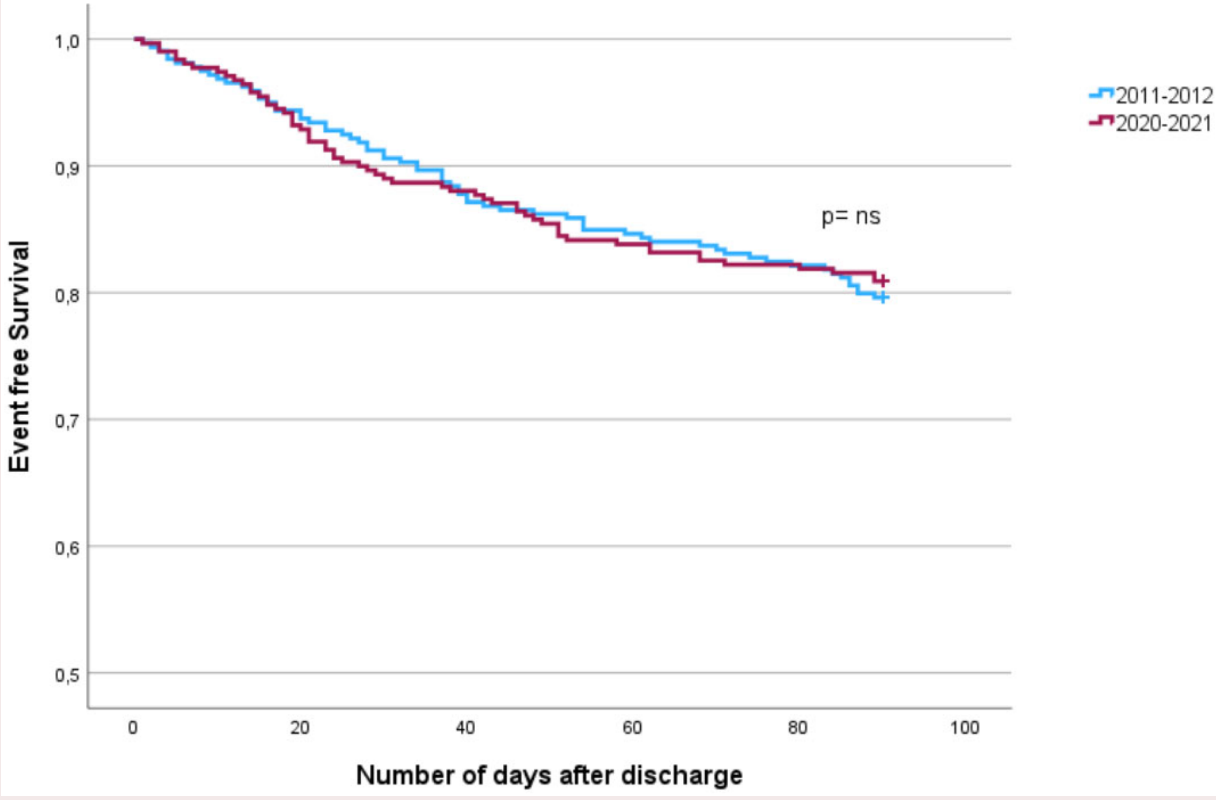


Figure 2. (A) Forest plot of 5-year multivariate risk of pre-and postoperative mortality. (B) Forest plot of 5-year multivariate likelihood of AVR referral.

Conclusions: Clinical characteristics and comorbidities of patients admitted with acute HF did not change significantly between 2011 and 2022. Uptake of evidence-based medicine for HF increased, as did the use of implantable devices, but still with considerable potential for improvement. Although length of stay decreased significantly, rehospitalization rates and all-cause mortality within 90 days post-discharge remained high and did not improve. These sobering results illustrate the need for continuing efforts to improve the care and outcome of HF patients.

Post-diuretic spot urine sodium assessment in acute heart failure: a retrospective analysis (#)

Lotte Colson[a], Simon Vanhentenrijk[a,b], Theodoros Kalpakos[a,b], Bram Roosens[a,b], Berlinde Von Kemp[b], Tim Balthazar[b], Stijn Lochy[b] and Frederik H. Verbrugge[a,b]

[a]Faculty of Medicine and Pharmacy, Vrije Universiteit Brussel, Brussels, Belgium; [b]Centre for Cardiovascular Diseases, University Hospital Brussels, Brussels, Belgium

Background/introduction: Post-diuretic spot urine sodium concentration (UNa) reflects diuretic efficiency in acute heart failure (AHF) and its assessment has been recommended to identify diuretic resistance early and appropriately intensify treatment.
Purpose: Real-world data on UNa-guided diuretic therapy in AHF may help to better understand potential benefits of this approach and identify implementation barriers.
Methods: Automated query of the electronic medical record identified patients admitted to the cardiac intensive care unit of a single tertiary care hospital between November 2018 and December 2021, who received intravenous loop diuretics. Detailed manual chart review confirmed the AHF diagnosis. Stratification was performed based on whether post-diuretic UNa was assessed within 24 h of admission.
Results: AHF was confirmed in 340/380 identified patients. Post-diuretic UNa was assessed in 117 (34%), more frequently when ejection fraction was reduced and heart failure more advanced. Patients with versus without post-diuretic UNa assessment received higher doses of intravenous loop diuretics and more frequently acetazolamide and thiazide-like diuretics ($p < 0.001$ for all), resulting in a trend towards greater urine output despite more advanced heart failure (2.924 ± 1.775 ml vs. 2.516 ± 1.355 ml, respectively; $p < 0.065$). Diuretic therapy remained more intense at discharge in the post-diuretic UNa group, with also a higher prescription rate of angiotensin receptor-neprilysin inhibitors ($p = 0.021$). Serum creatinine evolution was similar irrespectively from UNa assessment, but was more dynamic in patients with UNa ≤80 mmol/L versus ≥81 mmol/L. After adjustments for baseline characteristics, the risk for death or heart failure readmission was similar in patients with versus without UNa assessment [HR(95%CI) = 1.43(0.88–2.32); $p = 0.150$].
Conclusions: Post-diuretic UNa assessment in AHF was associated with more intense diuretic regimens, preserving urine output despite its use in a sicker population.

Determinants of rehospitalisation, dialysis and death in heart failure: a single-centre retrospective study

Maarten Falter[a,b,c], Michelle Vandormael[a,d], Margaretha van 't Klooster[a,d], Mathijs Vos[a,b] and Paul Dendale[a,c]

[a]Hasselt University, Hasselt, Belgium; [b]KULeuven, Leuven, Belgium; [c]Heart Centre Hasselt, Hasselt, Belgium; [d]Vrije Universiteit Brussel, Brussels, Belgium

Background/introduction: Heart failure (HF) is an important cause of hospitalisations and mortality. Several factors influencing HF outcomes are known, such as age and kidney function.
Purpose: The aim of this study was to identify which determinants influence rehospitalisation rate, progression to end-stage renal disease and mortality rate in HF.
Methods: A single-centre retrospective study was performed, including participants admitted in Jessa hospital in Belgium between April 2019 and March 2020 for fluid overload due to HF. All participants required an increase or start of diuretic treatment, and had a New York Heart Association class of 2, 3 or 4. A covariates analysis was executed investigating eleven determinants. The primary outcome was the composite endpoint of days lost due to cardiovascular rehospitalisations, dialysis and death in patients with HF.
Results: 373 patients were included in the database. Mean age was 76.87 years, 198 were male, mean BMI was 27.06 kg/m^2, median eGFR was 49 ml/min/1.73m^2. Ischaemic heart disease was the most common aetiology of HF at 41.82%. 57.91% of participants had an LVEF ≤50. Both a higher BMI and a higher eGFR correlated with fewer days lost. Other investigated factors such as diabetes had no significant influence.
Conclusions: The findings regarding eGFR confirm previous literature that a higher eGFR results in fewer days lost. This study supports the obesity paradox which implies a higher BMI is favourable for readmission rates and mortality after the initial diagnosis of HF.

Beyond obesity: unravelling the intricate role of epicardial adipose tissue in Heart failure with preserved ejection fraction

Martin Leroy, Nassiba Menghoum, Maria Chiara Badii, Sibille Lejeune, Clotilde Roy, David Vancraeynest, Agnès Pasquet, Christophe Beauloye, Bernhard Gerber and Anne-Catherine Pouleur

Cliniques universitaires Saint Luc, Brussels, Belgium

Background/introduction: Heart failure with preserved ejection fraction (HFpEF) is increasingly prevalent due to ageing and comorbidities. Recent data suggest that epicardial adipose tissue (EAT) contributes to local inflammation and cardiac remodelling.
Purpose: This study aims to investigate the relationship between ventricular EAT assessed by cardiac magnetic resonance (CMR), and clinical, biological, imaging features in controls, pre-clinical HF and HF patients
Methods: Patients from a single centre, enrolled between December 2015 and June 2017, were categorised according to the universal definition stage classification of HF and compared to age- and sex-matched controls. Participants underwent blood sampling, echocardiography, and CMR. Biventricular EAT volume was quantified in short-axis cine stacks at end-diastole. Association between EAT, HF staging, clinical, imaging, and biological parameters was analysed using machine learning approches.
Results: A total of 104 consecutive HF patients, 16 pre-HF patients, and 27 age- and sex-matched controls were included. EAT volume was significantly higher in HF patients compared to pre-HF and controls ($72.4 \pm 20.8\,ml/m^2$ vs $55 \pm 12\,ml/m^2$ vs $48 \pm 9\,ml/m^2$, respectively, $p < 0.001$). Body mass index (BMI) and diabetes prevalence did not differ between pre-HF and HF patients. Multivariate regression logistic and random forest classification identified EAT as a strong predictor of HF status. EAT volume showed significant correlations with H2FPEF score ($r = 0.41$, $p = 0.003$), troponin ($r = 0.41$, $p < 0.001$), NTproBNP ($r = 0.37$, $p < 0.001$), soluble ST2 ($r = 0.30$, $p < 0.001$), E/e' ratio ($r = 0.33$, $p < 0.001$), and left ventricular global longitudinal strain ($r = 0.35$, $p < 0.001$). Among HF patients, those with high EAT were younger, had a higher prevalence of ischaemic cardiomyopathy, more metabolic disorders, elevated inflammatory markers, greater diastolic dysfunction, systolic dysfunction, and focal myocardial fibrosis.
Conclusions: EAT volume demonstrated a continuum of increase from controls to pre-HFpEF and HFpEF patients, independent of BMI. EAT was a robust predictor of HFpEF status, reflecting metabolic disorders, pro-inflammatory state contributing to myocardial injury and functional impairment.

Insights into the management of heart failure with preserved ejection fraction: results from a Belgian survey

Caroline Verhestraeten, Charlotte Wyckmans, Joke Devoldere, Coralie Georges and Michael Maris

AstraZeneca, Dilbeek, Belgium

Background/introduction: Heart failure with preserved or mildly reduced ejection fraction (HFpEF) is common and associated with high morbidity and mortality. As a disease modifying treatment became only recently available in Belgium, awareness and specific patient journey insights are rather limited. To better map the current management of HFpEF in Belgium, a nationwide survey for cardiologists was conducted.
Purpose: Mapping the complete HFpEF patient journey, including screening, referral, diagnosis, treatment and follow-up.
Methods: An upfront validated survey consisting of 50 multiple choice questions was send to cardiologists using Microsoft Forms.
Results: 41 Belgian cardiologists, distributed over Belgium and with an average experience of 23 years, completed the survey. Around 60% of the responders answered that 41–60% of their total HF patients have HFpEF. These patients have decreased exercise tolerance (93%), dyspnoea (90%) and fatigue (63%) as main symptoms, whereas diagnosis is mainly based on anamnesis, echocardiography and physical examinations. More than half of the cardiologists stated not to use a diagnostic algorithm, such as H2FPEF or HFA-PEFF, or to perform extended lab tests, ECG or RX Thorax. Concerning treatment, all responders answered that they prescribe SGLT2i to treat HFpEF patients, followed by diuretics (90%) and MRA (73%) for a more symptomatic approach. The main objective of treatment was mainly improvement of quality of life (46%) and prevention of hospitalisation (37%). HFpEF patients reach the cardiologists mainly by general practitioner (GP) referral, followed by patient initiative and through the emergency department. The absolute majority (83%) of responders would aim for a multidisciplinary approach, implicating endocrinologist, nephrologists and GP that is a key player to recognise worsening HF, managing the comorbidities, follow-up on the blood analysis and screen for HF.
Conclusions: This survey showed that HFpEF is a complex disease involving multiple stakeholders, but a clear multidisciplinary guidance to diagnose, treat and follow-up these patients is currently lacking.

INVASIVE AND INTERVENTIONAL CARDIOLOGY

Angiography-derived physiological assessment after percutaneous coronary intervention of chronic total occlusions

Gianluca Castaldi[a], Alice Benedetti[b], Enrico Poletti[b], Alice Moroni[b], Benjamin Scott[b], Paul Vermeersch[b], Carlo Zivelonghi[b], Johan Bennett[a] and Pierfrancesco Agostoni[b]

[a]UZ Leuven, Leuven, Belgium; [b]ZNA Middelheim, Antwerp, Belgium

Background/introduction: In the era of optimal percutaneous coronary intervention (PCI), few data exploring the impact of physiologic suboptimal results after successful revascularization of chronic total occlusion (CTO) are available.
Purpose: The aim of our study was to perform an immediate post-CTO-PCI angiography-derived physiological assessment to investigate the rate of suboptimal results and characterise the pattern of residual disease.
Methods: Sixty cases of successful CTO-PCI were selected for this retrospective analysis. In all patients, the post-CTO-PCI Murray-based Fractional Flow Reserve (μFR), residual trans-stent gradient (TSG) and corrected TSG_{stent} were calculated. In physiological suboptimal results (μFR <0.90), the virtual pullback pressure gradient (PPG) curves were analysed to localise the main pressure drop-down and characterise patterns of residual disease. The virtual pullback pressure gradient index (vPPGi) was then calculated to objectively characterise the dominant pattern of residual disease (predominant diffuse vs predominant focal).
Results: In 28 cases (46.7%) we found a μFR <0.90. Among these, we found a pre-stent localisation of the main residual pressure drop in 2 (7.1%), a distal localisation in 17 (60.7%) and an intra-stent localisation in 9 cases (32.2%). Intra-stent residual disease showed 2 cases of mixed and 7 cases of diffuse patterns. Distal residual disease was characterised by a focal pattern in 12 cases, diffuse in 2 and mixed in 3. In 13 cases (21.7%) we found a TSG ≥0.04 while in 9 cases (15.0%) TSG_{stent} was ≥0.009. In the predominant diffuse phenotype (vPPGi <0.65), we found a higher rate of TSG ≥0.04 (61.5% vs 20.0%, $p=0.025$) and TSG_{stent} ≥0.009 (46.2% vs 20.0%, $p=0.017$) while in the dominant focal phenotype poor-quality distal vessel was constantly present.
Conclusions: In our cohort, post-CTO-PCI suboptimal physiological result was frequent (46.7%). Predominant focal phenotype was constantly associated with distal vessel poor-quality while in patients with predominant diffuse phenotype rate of TSG ≥0.04 and TSGstent ≥0.009 were significantly higher.

Bleeding and thrombotic risk of different anti-platelet regimens post transcatheter edge-to-edge mitral valve repair in patients with an indication for oral anticoagulation: results from an all-comers national registry (#)

Marc Claeys[a], Adel Aminian[b], Lies Delodder[a], Willem Dewilde[c], Bert Ferdinande[d], Stéphanie Geerinck[a], Olivier Lambrechts[a], Stijn Lochy[e], Marc Vanderheyden[f], Jan Van der Heyden[g], Liesbeth Rosseel[h], Stefan Verheye[i] and Christophe Dubois[j]

[a]University Hospital Antwerpen, Antwerpen, Belgium; [b]Centre hospitaliler universitair de Charleroi, Charleroi, Belgium; [c]Imelda Hospital, Bonheiden, Belgium; [d]Hospital Oost-Limburg, Genk, Belgium; [e]Brussels University hospital, Brussels, Belgium; [f]OLV Hospital Aalst, Aalst, Belgium; [g]Hospital Sint-Jan Brugge, Brugge, Belgium; [h]ASZ Hospital Aalst, Aalst, Belgium; [i]ZAS Hospital, Antwerp, Belgium; [j]University Hospital Leuven, Leuven, Belgium

Background/introduction: Evidence-based recommendations for antithrombotic treatment in patients who have an indication for oral anticoagulation (OAC) after transcatheter edge-to-edge mitral valve repair (TEER) are lacking
Purpose: To compare bleeding and thrombotic risk for different antithrombotic regimens post-TEER with MitraClip in an unselected population with the need for OACs.
Methods: Bleeding and thrombotic complications (stroke and myocardial infarction) up to 3 months after TEER with mitraclip were evaluated in 322 consecutive pts with an indication for OACs. These endpoints were defined by the Mitral Valve Academic Research Consortium criteria and were compared between two antithrombotic regimens: single antithrombotic therapy with OAC (single ATT) and double/triple ATT with a combination of OAC and aspirin and/or clopidogrel (combined ATT).

Results:

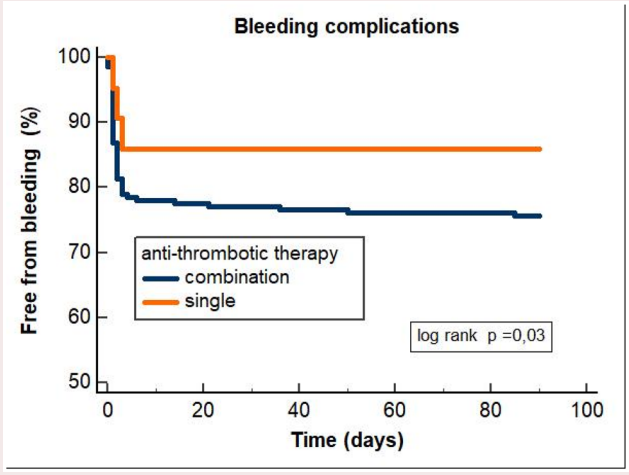


Figure 1. Sankey diagram demonstrating the prevalence of species among bloodstream infections (BSIs), followed by the separation in with and without infective endocarditis (IE) cases and later distribution of IE case considering only typical species by European Society of Cardiology (ESC) guidelines for the management of endocarditis 2020. The rectangles are proportional to the absolute number of cases within which species.

Collectively, 108 (34%) patients received single ATT, 203 (63%) received double ATT and 11 (3%) received triple ATT. Bleeding events occurred in 67 patients (20.9%), with access site related events being the most frequent cause (37%). Bleeding complications were observed more frequently in the combined ATT group than in the single ATT group: 24% versus 14% ($p=0.03$, adjusted RR; 0.55 (0.3–0.98)). Within the combined group, the bleeding risk was 23% in the double ATT and 45% in the triple ATT group. Thrombotic complications occurred in only 3 patients (0.9%), and all belonged to the combined ATT group.

Conclusions: In patients with an indication for OACs, withholding of antiplatelet therapy post-TEER with Mitraclip was associated with a 45% reduction in bleeding and without a signal of increased thrombotic risk.

The impact of FFRCT on clinical outcomes after myocardial revascularization

Johanna Lammens, Andreea Motoc, Bert Vandeloo, Kaoru Tanaka, Dries Belsack, Vincent Michiels, Stijn Lochy, Bernard Cosyns and Jean-François Argacha

Universitair Ziekenhuis Brussel, Brussel, Belgium

Background/introduction: FFRCT is endorsed by guidelines to evaluate the functional impact of obstructive coronary artery disease. Some researchers aim now to use FFRCT to guide the myocardial revascularization strategy. However, no dedicated study has evaluated how FFRCT influences outcomes in revascularized patients.

Purpose: To assess the impact of coronary computed tomography angiography (CCTA)-derived fractional flow reserve (FFRCT) on patients' outcomes after a myocardial revascularization by percutaneous coronary interventions (PCI) or by coronary artery bypass graft (CABG).

Methods: Revascularized patients by PCI or CABG were included from a 2013 to 2021 tertiary university hospital CCTA registry. Propensity score-based covariate adjustments by multivariable logistic regression analysis were performed to assess the impact of FFRCT on a composite end point of major adverse cardiac events (MACE). MACE included cardiac death, new hospitalisation for acute myocardial infarction (MI) or heart failure (HF) and repeated revascularization.

Results: 656 patients were revascularized after a CCTA during the study period including 451 PCI (68.8%) and 205 CABG (31.2%). FFRCT was performed in 308 cases (47%). The median duration of the follow up was 4.7 ± 1.9 years. MACE occurred in 143 patients (21.8%) including 50 death, 25 MI, 18 HF and 89 repeated revascularization. In univariate analysis, FFRCT tends to decrease the rate of MACE after myocardial revascularization from 24.7 to 18.5% (p 0.057). However, after

propensity score adjustment, FFRCT use was not independently associated with decreased rate of MACE (OR: 0.87; 95% CI 0.60–1.28, *p* NS). Similar nonsignificant findings were observed in CABG and PCI subgroups.
Conclusions: We observed in a long-term follow-up real-world registry that implementing FFRCT tended to be associated with better outcomes after a myocardial revascularization by PCI or CABG. Further prospective studies are needed to strengthen the role of FFRCT as a tool able to improve clinical outcomes after a myocardial revascularization.

Optimization of absolute coronary blood flow measurements to assess microvascular function in sheep: validation of hyperaemia and higher infusion speeds (*)

Lennert Minten[a,b,c], Johan Bennett[a,b], Keir McCutcheon[a], Wouter Oosterlinck[a,b], Michiel Algoet[a], Hisao Otsuki[c], Kuniaki Takahashi[c], William Fearon[c] and Christophe Dubois[a,b]

[a]KU Leuven, Leuven, Belgium; [b]UZ Leuven, Leuven, Belgium; [c]Stanford University, Palo Alto, CA, USA

Background/introduction: Reliable assessment of coronary microvascular function is essential. The new technique of continuous coronary thermodilution to measure absolute coronary blood flow (ABF) opens up new options for microvascular assessment, both in research and clinical settings.
Purpose: Our goals were to validate the potential of saline infusion to generate true maximum hyperaemia *in vivo*. Furthermore we wanted to validate ABF measured with continuous coronary thermodilution *in vivo* at high (40–50 ml/min) infusion speeds and asses its safety.
Methods: To assess safety and effects of IV adenosine fourteen closed-chest sheep underwent absolute coronary flow measurements with increasing saline infusion speeds with and without adenosine while under general anaesthesia. To validate the ABF measurements, an additional seven open-chest sheep underwent these measurements with epicardial doppler flow probes as gold standard for coronary blood flow measurements. Coronary resistance with each infusion speed was compared with the gold standard of maximal hyperaemia (reactive hyperaemia after 45 s occlusion).
Results: Mean maximal hyperaemia was 422.4 woods units (WU) ± 279.4 standard deviation (SD). Coronary resistance with 20 ml/min saline infusion was significantly higher than this (655.4 ± 280.1 WU, $p = 0.005$) while the coronary resistance with 30 ml/min infusion speed (414.8 ± 187.5 WU, $p = 0.918$) was not significantly different. There was a significant bias towards coronary flow overestimation (Bland-Altman: Bias ± SD: −73.09 ± 30.52, 95% Limits of agreement: −132.9 to −13.27) with the higher infusion speeds. Additionally, they caused ischaemic changes in 28.6% (40 ml/min) and 42.9% of animals (50 ml/min). Fatal ventricular fibrillation followed in two sheep (9.5%) with 50 ml/min.
Conclusions: Continuous saline infusion of 30 ml/min, but not 20 ml/min, induced maximal hyperaemia. ABF measured with saline infusion speeds of 40–50 ml/min was not accurate, since there was a significant flow overestimation and not safe, since it resulted in ischaemia and arrythmias.

Giant aneurysms

Merveil Ndongala and Hannes Van Acker

Clinique de l'Europe-Site Ste-Elisabeth, Brussel, Belgium

Background/introduction: We report the case of a 49-year-old man who was admitted to our cardiology department with no relevant medical history or cardiac risk factors for a coronary angiography due to abnormal computed tomography of the coronary arteries showing numerous anomalies as giant aneuvrysms.
Purpose: In this paper we describe a number of coronary anomalies which have been discovered without any link to the onset symptomatology.
Methods: The 49 years old complained about palpitations followed by dizziness an elevated pulse rate.
Twenty-four-hour Holter monitoring revealed nonsustained ventricular tachycardia.
CT scans of the coronary arteries performed as part of the work-up for ventricular tachycardia revealed numerous coronary anomalies, which were confirmed on coronary angiography.

Results:

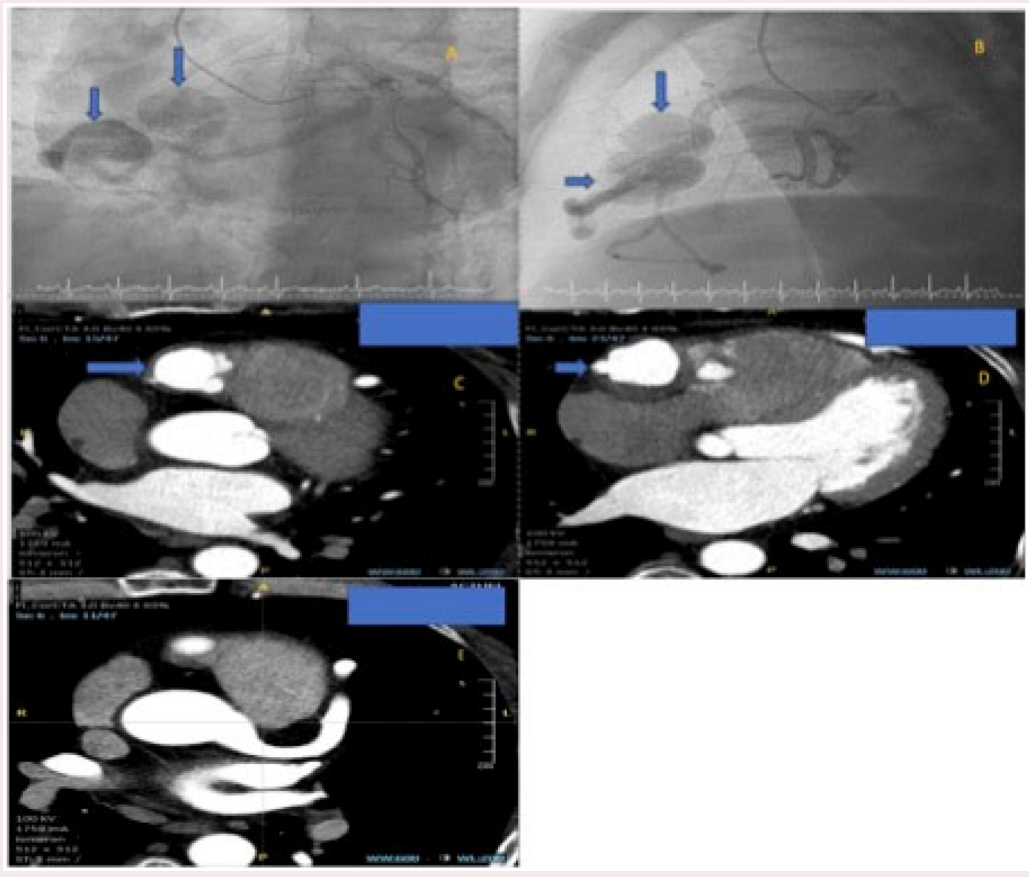


Figure 2. Echocardiographic screening for infective endocarditis (IE) in bloodstream infections (BSI) per species, prevalence of IE and number of BSI per species.

Computed tomography of the coronary arteries revealed congenital atresia of the right coronary artery, a large left main coronary artery, a substantial left anterior descending artery with two huge coronary aneurysms (PanelC: first aneurysm, 4.9×3.8 cm; PanelD: second aneurysm, 3.7×3.6 cm, causing mild compression of the right atrium and ventricle; arrows; PanelE: no right coronary artery) at its tip, with local thrombi.
Coronary angiography (PanelA: left anterior oblique [30°] cranial [30°] view; PanelB: left anterior oblique [90°] view), confirmed the two aneurysms (arrows).
Conclusions: As solid data on the management of giant aneurysms are not available, the patient was started on aspirin and referred to a tertiary cardiology centre for appropriate management of the two aneurysms.
At last follow-up, the patient remained asymptomatic and no further intervention was attempted, especially as the management would be surgical.

Left main coronary angioplasty: impact of the technique on clinical outcome. A monocentric retrospective review

Amaury Sogorb and Joëlle Kefer

Cliniques Universitaires Saint Luc, Brussels, Belgium

Background/introduction: The optimal strategy for left main coronary artery (LMCA) angioplasty is debated. While DK-Crush V study advocates for a two-stent approach, EBC Main study supports provisional stenting.
Purpose: This retrospective analysis reviewed distal LMCA angioplasty performed at the Cliniques Universitaires Saint-Luc from 2010 to 2021. The objective was to evaluate the influence of bifurcation strategies (provisional stenting PS vs. two-stent techniques 2S) on clinical outcomes and assess technical aspects within these strategies.

Methods: From an initial pool of 350 patients, 52 with true bifurcations were treated with second-generation DES −38 in the PS group and 14 in the 2S group.
The primary clinical endpoint was target lesion failure.
Results: 38 patients were in the PS group (age 80±9 years; 73.7% male) and 14 in the 2S group (age 76±11 years; 78.7% male); both groups had similar clinical characteristics. The 2S group had a higher syntax score (27±10 vs. 21±8; $p=0.007$) and longer lesion side branch length (7.5±5.1 vs. 4.8±5.1; $p=0.04$). TLF rates at 3 years were comparable at 26±7%.
In the PS group, 95% received a single stent, emphasising the provisional stenting approach. Kissing balloon was more frequent in the 2S group (79% vs. 45%; $p=0.05$).
Procedures in the PS group more frequently concluded with a final POT (63% vs. 29%; $p=0.02$), while the 2S group predominantly ended with a final kissing technique (43% vs. 26%; $p=0.31$).
POT-side-POT technique in PS showed no cardiac deaths and a favourable TLR (HR 0.52; $p=0.54$), unlike the kissing technique (HR 6.1; $p=0.06$).
Conclusions: Due to the limited sample size and inherent limitations of a retrospective study, our research does not conclusively prove the superiority of a bifurcation strategy. Nevertheless, it suggests a potential protective effect of the POT-side-POT technique, an advantage not observed with the kissing technique.

NON-INVASIVE IMAGING

Predictive power of different fractional flow reserve measurement methods for revascularization

Mayuko Tsugu[a], Kaoru Tanaka[a], Yuji Nagatomo[b], Dries Belsack[a], Nico Buls[a], Jean-François Argacha[a], Bernard Cosyns[a], Toshimitsu Tsugu[a] and Johan De Mey[a]

[a]Universitair Ziekenhuis Brussel, Brussels, Belgium; [b]National Defense Medical College Hospital, Tokorozawa, Japan

Background/introduction: Fractional flow reserve (FFR) is an established diagnostic method to assess ischaemia in obstructive coronary artery disease (CAD). Revascularization of lesions with ischaemia proven by FFR reduces the risk of major adverse cardiac events compared to optimal medical therapy (OMT) alone. By the guidelines, an FFR measurement point of 20 mm distal to the lesion has been recommended. Trans-lesion FFRCT (ΔFFRCT) has attracted attention as a novel method for assessing coronary flow disturbance.
Purpose: To compare the predictive power of revascularization in patients with obstructive CAD between ΔFFRCT and one-point measurement of distal FFR (FFRCT and invasive FFR).
Methods: A total of 1722 outpatients with suspected stable CAD who underwent FFRCT and/or invasive FFR between January/2017 and July/2023 were evaluated. Among them, 298 patients (377 vessels) who underwent both procedures and showed obstructive CAD (≥50% stenosis in angiography and CT angiography) were analysed. They were stratified into two groups (moderate [50–69%]: 161 vessels and severe [70–99%]: 220 vessels) according to the severity of stenosis. The treatment strategy of OMT alone or OMT plus revascularization was assigned by the experienced interventional cardiologists.
Results: The assigned treatment strategies were 98 vessels (60.9%)/63 vessels (39.1%) for OMT/OMT plus revascularization in the moderate stenosis group, and 41 vessels (18.6%)/179 vessels (81.4%) in the severe stenosis group. ΔFFRCT, distal FFRCT, and distal invasive FFR, respectively. In the moderate stenosis group, AUC values were 0.66, 0.58, and 0.63 for ΔFFRCT, distal FFRCT, and distal invasive FFR, respectively. In the severe stenosis group, AUC values were 0.68, 0.62, and 0.71 for ΔFFRCT, distal FFRCT, and distal invasive FFR, respectively (Figure). ΔFFRCT was the strongest predictor for revascularization in overall and moderate stenosis groups.
Conclusions: ΔFFRCT may harbour the potential to predict revascularization more accurately than one-point measurement of the distal FFRCT.

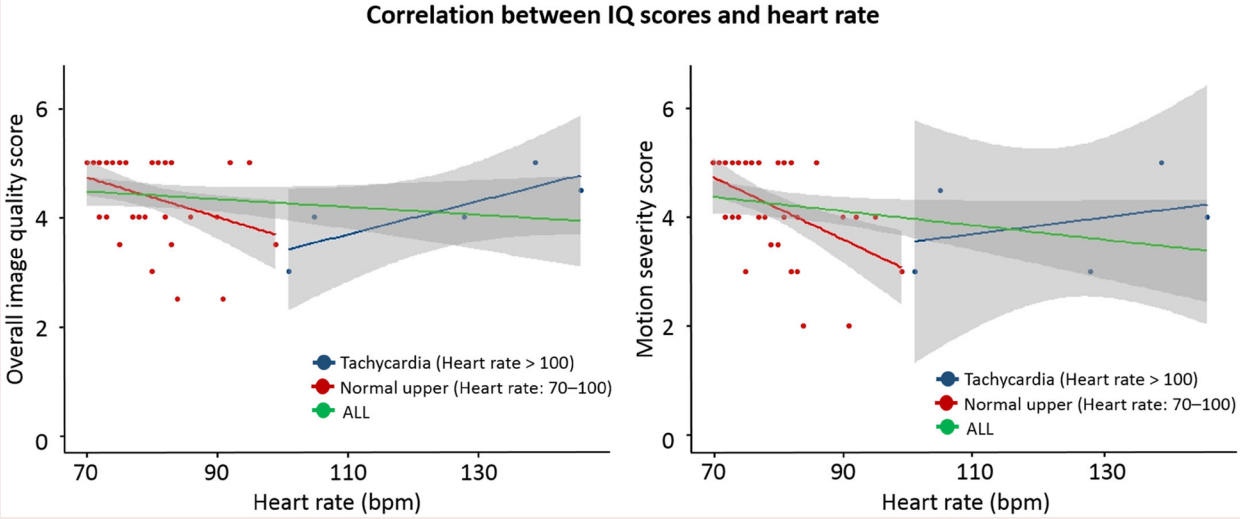
Significance of a high-speed CT gantry rotation device for tachycardia patients

Mayuko Tsugu, Dries Belsack, Toshimitsu Tsugu, Kaoru Tanaka, Nico Buls and Johan De Mey

Department of Radiology, Universitair Ziekenhuis Brussel, Brusseles, Belgium

Background/introduction: The presence of tachycardia complicates the acquisition of good-quality images in coronary CT angiography (CCTA). Recently, a high-speed CT gantry rotation device (gantry rotation time: 0.23 s) has been introduced, allowing image acquisition at increased temporal resolution without rate control using beta-blockers.

Purpose: To compare scan parameters and the image quality (IQ) in patients with normal upper heart rate (70–100 bpm) and tachycardia (≥100 bpm), in the absence of beta-blocker.
Methods: A total of 50 consecutive patients who underwent CCTA with suspected coronary artery disease and heart rate ≥70 bpm were evaluated and divided into two groups according to heart rate level: normal upper heart rate ($n=45$), tachycardia ($n=5$). All scans were performed in the absence of beta-blockers. Two experienced cardiovascular radiologists evaluated IQ by attributing an overall IQ score and a motion severity score on a 5-point likert scale. Scan parameters and IQ scores were compared between both groups.
Results: No significant differences in scan parameters were observed between the two groups (normal upper heart rate vs. tachycardia; tube voltage 81.3±9.7 vs. 86.0±19.5 kV, $p=0.37$, tube current 1148.8±237.8 vs. 1102.3±393.0 mA, $p=0.72$, contrast volume 40.6±9.0 vs. 36.8±11.0 ml, $p=0.39$, Dose length product 147.6±106.1 vs. 173.4±157.6 mGy cm, $p=0.63$, CT dose index volume 9.2±5.7 vs. 10.6±7.5 mGy, $p=0.63$, best scan phase 56.5±16.4 vs. 51.0±13. 5%, $p=0.48$). No significant differences in the IQ (overall IQ score 4.5±0.6 vs. 4.2±0.8, $p=0.39$, motion severity score 4.3±0.8 vs. 4.0±1.0, $p=0.52$). Heart rate did not correlate with IQ in both groups (overall IQ score: normal upper heart rate; $r=-0.37$, tachycardia; $r=0.87$, motion severity score: normal upper heart rate; $r=-0.50$, tachycardia; $r=0.41$) (Figure).



Conclusions: The presence of tachycardia had no significant impact on scan parameters and IQ.

Feasibility of predicting revascularization with trans-lesion gradient CT-derived fractional flow reserve (FFRCT) (#)

Mayuko Tsugu[a], Kaoru Tanaka[a], Yuji Nagatomo[b], Dries Belsack[a], Jean-François Argacha[c], Bert Vandeloo[c], Bernard Cosyns[c], Toshimitsu Tsugu[a] and Johan De Mey[a]

[a]Department of Radiology, Universitair Ziekenhuis Brussel, Brussels, Belgium; [b]Department of Cardiology, National Defense Medical College Hospital, Tokorozawa, Japan; [c]Cardiology, Centrum voor Hart- en Vaatziekten, Universitair Ziekenhuis Brussel, Brussels, Belgium

Background/introduction: Fractional flow reserve (FFR) is recommended to determine the indication for revascularization in patients with coronary artery disease. FFR measurement is performed at only one point distal to the stenotic lesion. An inherent problem with this method is the difficulty in obtaining accurate measurements at the site distal to the stenotic lesions. Trans-lesion gradient of FFRCT (ΔFFRCT) is implemented as a novel method for the assessment of coronary flow disturbance and its implementation is unknown.
Purpose: To investigate the diagnostic accuracy for revascularization in patients with obstructive coronary artery disease (CAD), comparing different modalities.
Methods: A total of 1722 outpatients with suspected stable CAD who underwent FFRCT and/or invasive FFR (FFRINV) between January 2017 and July 2023 were evaluated. Among them, 300 patients (381 vessels) who underwent both FFRCT and FFRINV and showed obstructive CAD (≥50% coronary stenosis in angiography and CT angiography) were included for the present analysis. Distal FFR (distal-FFRCT and FFRINV) was measured at a point of 20 mm distal to the lesion. Depending

on the results of the examination, the treatment strategy was determined to be optimal medical therapy (OMT) or OMT + revascularization by experienced interventional cardiologists.
Results: The values of ΔFFRCT, distal-FFRCT, FFRINV, and coronary stenosis were 0.21 ± 0.14, 0.68 ± 0.12, 0.81 ± 0.08, and 73.7 ± 14.3%, respectively. Distal-FFRCT and FFRINV should be close values, but no correlation between them ($r = 0.20$, 95%CI, −0.002–0.38, $p = 0.052$). The treatment strategy consisted of OMT for 138 vessels (36.6%) and revascularization for 239 vessels (63.4%). Odds ratio of revascularization by FFRCT cut-off value of 0.80 was comparable to that determined by coronary angiography (Figure).
Conclusions: As a potential mechanism, difficulty in FFRINV measurement at an accurate guideline-recommended position might lead to fluctuation of measured values. ΔFFRCT might have a potential to be an alternative to FFRINV due to its small variance of measurement.

PREVENTION AND REHABILITATION

Post-exercise ketosis improves endurance performance, but not cardiac function during an 8-week training intervention (*)

Youri Bekhuis[a,b], Ruben Robberechts[c], Thomas Rosseel[b], Karim Taha[d,e], Chiel Poffé[f] and Guido Claessen[a,g,h]

[a]Department of Cardiovascular Sciences, KU Leuven, Leuven, Belgium; [b]Department of Cardiology, UZ Leuven, Leuven, Belgium; [c]Exercise Physiology Research Group, Department of Movement Sciences, Leuven, Belgium; [d]Department of Cardiovascular Sciences Cardiology, KU Leuven Leuven, Leuven, Belgium; [e]Department of Cardiology University Medical Centre Utrecht, Utrecht, Netherlands; [f]Exercise Physiology Research Group, Department of Movement Sciences, KU Leuven, Leuven, Belgium; [g]Department of Cardiology, JESSA Hospital, Hasselt, Belgium; [h]UHasselt, Faculty of Medicine and Life Sciences/LCRC (-MHU), Diepenbeek, Belgium

Background/introduction: Post-exercise ketosis (PEK) is commonly used in endurance athletes to mitigate overtraining symptoms and stimulate recovery. In addition, acute nutritional ketosis can temporarily improve cardiac function at rest in healthy individuals and heart failure patients. As such, PEK may potentially improve exercise recovery and exercise-induced cardiac adaptations, but this remains to be investigated.
Purpose: The aim of this study is to investigate the effects of PEK on (a) endurance performance, (b) cardiac adaptations, and (c) safety, during a well-balanced 8-week training intervention to prevent overtraining.
Methods: Recreationally active men ($n = 28$; age: 25.11 ± 4.32 years) were enrolled in a double-blind, placebo-controlled, supervised 8-week endurance training program. The intervention group ($n = 14$) received daily oral ketone ester (KE) immediately after each training session and 30 min before sleeping time, whilst the controls ($n = 14$) ingested an isocaloric control drink (CON). Before (PRE) and after (POST) the training intervention, endurance performance, and cardiac function during exercise were evaluated using a 30-minute time trial (TT_{30min}) and cardiopulmonary exercise testing combined with echocardiography (CPETecho), respectively. Left ventricular global longitudinal strain during exercise was used as a measure of contractile reserve.
Results: Mean power output during TT30min at POST (299 ± 28 W vs 291 ± 27 W, $p = 0.0004$) was significantly higher between KE and controls. Peak oxygen consumption (CON:208 ± 320 ml vs. KE:326 ± 398 ml, $p > 0.05$) and peak exercise cardiac output (KE:0.82 ± 3.28 vs. CON:1.67 ± 1.97 L/min, $p > 0.05$) increased after the training intervention, but no significant difference was observed between the intervention group versus controls. Global longitudinal strain during exercise was similar in PEK compared to controls.
Conclusions: PEK improves endurance performance in recreationally active men but does not impact cardiac function during exercise. This indicates that the positive effect of PEK on exercise performance is not mediated by cardiac adaptations. Further research is required to elucidate the mechanisms through which PEK improves endurance performance.

Prevalence, awareness and therapeutic control of hypertension in Belgium: an opportunistic screening of nearly 6000 participants during the May Measurement Month campaigns 2017–2023

Tine De Backer[a], Jana Desloovere[b], Bregt Van Nieuwenhuyse[b], Hilde Heuten[c], Jean-Marie Krzesinski[d], Alexandre Persu[e], Tom Robberechts[f], Thomas Vanassche[g], Philippe Van de Borne[h] and Dirk De Bacquer[i]

[a]Department of Cardiology, Ghent University Hospital, Ghent, Belgium; [b]Servier Belgium and Luxembourg, Brussels, Belgium; [c]Department of Cardiology, Antwerp University Hospital, Antwerp, Belgium; [d]Division of Nephrology, CHU Sart Tilman, Liège, Belgium; [e]Division of Cardiology, Cliniques Universitaires Saint-Luc, Brussels, Belgium; [f]Department of Nephrology and Hypertension, Universitair Ziekenhuis Brussel, Brussels, Belgium; [g]Division of Cardiology, University Hospitals Leuven, Leuven, Belgium; [h]Clinique d'hypertension artérielle, CHU Erasme Brussels, Brussels, Belgium; [i]Department of Public Health and Primary Care, Ghent University, Ghent, Belgium

Background/introduction: The May Measurement Month (MMM) initiative is an annual global screening and awareness campaign started in 2017 by the International Society of Hypertension highlighting the importance of regular measurements of blood pressure (BP), the most important modifiable risk factor contributing to cardiovascular and all-cause mortality worldwide.
Purpose: Here we report on the results of the MMM campaign done in Belgium during the month of May in 2017, 2018, 2019, 2022 and 2023.
Methods: Participants ≥18 years were recruited through opportunistic sampling in 12 sites (mostly hospital entrances) across Belgium. Apart from standardised BP recordings (OMRON automated devices) by trained staff, data were collected on demographics, lifestyle factors and comorbidities. Hypertension was defined as raised blood pressure (systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg) and/or taking antihypertensive medication. Age-standardised prevalence rates were calculated using the overall Belgian population (1st January 2023) as reference.
Results: Data were collected from 5926 participants aged 51.5 years on average. Mean (SD) systolic and diastolic blood pressures were 125.9 (17.6) mmHg and 79.4 (10.9) mmHg with 26.7% exceeding the 140/90 mmHg threshold. Age-standardised prevalences (95% CI) of hypertension were 45.4% (42.6–48.1%) in men and 36.9% (34.8–39.0%) in women. Among the 2468 individuals with hypertension, 1938 (78.5%) had been previously diagnosed and 1578 (81.4%) of those with known hypertension, received antihypertensive treatment. Only about half of those being treated (56.3%) did achieve the target of systolic/diastolic BP <140/90 mmHg. Inadequate therapeutic control was independently associated with increasing age and higher body mass index. Untreated hypertension was significantly associated with male sex, age, body mass index and alcohol use.
Conclusions: Despite the limited representativeness of the sample, these data suggest that the 'rule of halves' for hypertension no longer holds in Belgium and that therapeutic control of hypertension is still suboptimal.

Propensity adjusted effects of environmental and socioeconomic biotope on the risk of coronary obstruction and myocardial ischaemia (#)

Tom De Potter[a], Els Verachtert[b], Gudrun Koppen[b], Kaoru Tanaka[c], Dries Belsack[c], Wissam Kahouaji Oujaidan[a], Jean-François Fils[d], Bernard Cosyns[a] and Jean-françois Argacha[a]

[a]Department of Cardiology, Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussels, Belgium; [b]VITO Health, Flemish Institute for Technological Research (VITO), Mol, Belgium; [c]Department of Radiology, Universitair Ziekenhuis Brussel, Vrije Universiteit Brussel, Brussels, Belgium; [d]Ars Statistica, Nivelles, Belgium

Background/introduction: Several studies reported positive associations between long-term exposure to PM2.5, NO_2, noise from road traffic and loss of residential green with coronary artery calcification score measurements, but their effects on coronary lumen reduction and flow impairment are still unknown.
Purpose: To assess the independent impacts of environmental and socioeconomic exposures on the incidence of obstructive coronary artery disease (OCAD: at least one stenosis of >50% in any vessel), abnormal derived fractional flow reserve (FFRCT) and subsequent myocardial revascularization.
Methods: 2619 consecutive patients screened by computed tomography angiography (CCTA) for stable chest pain between 01 January 2019 and 31 December 2020 were included. The last four years' mean exposure to PM2.5 and NO_2 were modelled using an interpolation method at the patient's living address. Distances to main road, normalised difference vegetation index, educational level and annual incomes of the surroundings were also modelled. Low exposure (data

below or equal to Q1) and high exposure (data above Q3) groups were defined and compared after a propensity score integrating the 13 known covariates affecting cardiovascular risk.
Results: Mean exposure to PM2.5 and NO_2 were 13.1 and 21.8 mg/m3, with all patients exposed to concentrations higher than the annual 2021 WHO standards. After propensity score matching, no environmental or socioeconomic factor was associated with the risk of OCAD or abnormal FFRCT. Myocardial revascularization risk was increased with PM2.5 exposure (RR:1.65; CI 95%:1.13–2.41) and annual income (RR:1.85; CI 95% 1.25–2.75), whereas myocardial revascularization risk was decreased with NDVI (RR: 0.59; CI 95% 0.41–0.86) and low educational level (RR:0.61; CI 95%:0.41–0.91).
Conclusions: After adjusting for all known parameters associated with cardiovascular risk, the patients' environment was not associated with coronary obstruction and subsequent ischaemia. Myocardial revascularisation rate was affected by both pollutant and socioeconomic environments, suggesting more advanced disease and/or difference in patient access to healthcare facilities.

Application of inclisiran in Belgian clinical practice: a study in patients with familial hypercholesterolaemia or cardiovascular disease

Alexia François, Alexandra Sperone and Olivier S. Descamps

Centre Hospitalier Universitaire HELORA, La Louvière, Belgium

Background/introduction: LDL-cholesterol (LDL-C) is a major risk factor for developing atherosclerotic cardiovascular disease (ASCVD) and lowering LDL-C levels by classical lipid-lowering drugs (LLD: statin and/or ezetimibe) is one of the most effective approach to prevent ASCVD. Recently, Injectable therapies directed against proprotein convertase subtilisin/kexin type 9 (PCSK9) have emerged, which further reduce LDL-C.
Purpose: To assess the reduction in LDL-C of inclisiran and its safety profile in patients whose LDL-C target is not achieved with the classical LLD.
Methods: We conducted a retrospective observational study including patients in whom inclisiran was initiated in our lipid clinics between 05/2022 and 01/2023. The primary outcome was to demonstrate LDL-C reduction after inclisiran injection. Secondly, the effect of inclisiran on renal and hepatic function was analysed.
Results: Overall, 52 patients (61 ± 10 years; 58% male) started inclisiran in this period of time. Baseline LDL-C was 144 ± 64 mg/dL, 40% had monogenic familial hypercholesterolaemia (62% with ASCVD). Overall, 83% had ASCVD and 48% were statin intolerant. The reductions of LDL-C were 42 ± 18% (N = 42) and 39 ± 18% (n = 26) respectively at 3 and 9 months after the first injection. At 3 months, the reduction was greater in statin-treated patients than in patients without statin: 48 ± 16% (N = 24) vs. 34 ± 19% (N = 16); p = 0.02. Some patients were resistant (LDL-C reduction <10%) to inclisiran (N = 4; all statin intolerant). By excluding resistant patients, reduction in LDL-C was 40 ± 13%(N = 12) after 3 months.
No side effect and no significant changes in creatinine, liver enzymes were observed.
Conclusions: In a real-life experience, Inclisiran lowered LDL-C by 48% in statin treated patients (identical to the 48% reduction in ORION trials). The LDL-C reduction is however lower in patients without statin compared in patients with statin and in this group, we observed totally resistant (22 versus 36%). The safety profile is excellent.

Real-life experiment with the new lipid-lowering treatment: bempedoic acid

Nicolas Mubiayi Mujani[a], Fabian Demeure[b], Alexandra Sperone[a] and Olivier Descamps[a]

[a]Department of Internal Medicine, Centres Hospitaliers Universitaires HELORA, La Louvière, Belgium; [b]Cardiology Department, CHU UCL Mont-Godinne, Namur, Belgium

Background/introduction: New guidelines emphasise more intensive LDL-cholesterol (LDL-C) lowering, with set to <70 mg/dL for high and <55 mg/dL for very high cardiovascular risk (HCVR and VHCVR). The recommended lipid-lowering drugs are statins and ezetimibe as first line plus bempedoic acid and PCSK9 inhibitors as add-on therapy. In clinical trials, bempedoic acid resulted to 24% and 17% LDL-C reduction respectively in statin-treated or statin-naïve patients.
Purpose: Our endpoint was to evaluate the real-life efficiency and security of bempedoic acid.
Methods: In this retrospective study, we selected patients of the lipid clinics of Jolimont and Mont-Godinne in whom bempedoic acid was initiated between February 2022 until February 2023. We excluded patients with no follow-up biology.
Results: Amongst 162 patients treated with bempedoic acid, 104 were intolerant to statins (group 1) and 58 received statins (group 2). Group 2 included more men and more patients with a previous history of cardiovascular disease. The LDL-C reduction achieved with bempedoïc acid was greater in group 1 than in group 2: 34 ± 20% versus 26 ± 20% (p = 0.01) after the exclusion of 9 patients who stopped bempedoic acid. Combining the 2 groups, therapeutic targets were reached in 16% HCVR patients (N = 49; LDL-C < 70 mg/dL) and 24% VHCVR patients (N = 113; LDL-C < 55 mg/dL).

In terms of safety profile, 11% reported intolerance to bempedoic acid (mainly myalgia and gastrointestinal symptoms). Serum creatinine increased by 0.05 ± 0.15 mg/dL and uric acid by 0.91 ± 0.99 mg/dL, in line with literature values. An increase in liver enzymes to more than 3 times normal has been reported in only 1% of cases.
Conclusions: Bempedoic acid is very effective in reducing LDL-cholesterol in real-life experience, with amplitudes similar to those described in randomised clinical trials. It is also safe and well tolerated specially in patients intolerant to statins.

Treatment of high- and very high-risk patients for the prevention of cardiovascular events in Belgium: baseline demographics from the observational SANTORINI study

Ernst Rietzschel[a,b] and Caroline Hody[c]

[a]Department of Internal Medicine and Paediatrics, Ghent University, Ghent, Belgium; [b]Biobanking and Cardiovascular Prevention, Ghent University Hospital, Ghent, Belgium; [c]Daiichi Sankyo, Braine-l'Alleud, Belgium

Background/introduction: Real-world evidence in Europe suggests suboptimal achievement of low-density lipoprotein cholesterol (LDL-C) goals. Reducing LDL-C especially in patients with high- and very-high cardiovascular (CV) risk would necessitate more intensive lipid-lowering therapy (LLT) regimens such as combination therapies. SANTORINI is the first observational study, since the 2019 ESC/EAS guidelines update. The study enrolled patients from March 2020 to February 2021 and was conducted across 14 European countries to evaluate whether lipid management in these patients has evolved.
Purpose: To describe patient characteristics and treatment patterns of LLTs in clinical practice for the management of LDL-C levels in a high- and very high-risk Belgian population.
Methods: Baseline data were assessed from recruited patients ≥18 years with high- and very-high CV risk requiring LLT. Risk was defined as per physician's assessment. For this analysis, data for patients from 27 care settings were extracted. These data included patient characteristics, medical history, current LLT and other co-medications documented at baseline.
Results: Among the 501 Belgian patients enrolled, the mean (standard deviation [SD]) age was 66.1 (11.07) years and 24.6% were female. Mean (SD) LDL-C was 80.91 (44.55) mg/dL. 72.3% of patients were classified as very-high-risk. The 2019 ESC/EAS guidelines were the most common basis for risk classification (62%). Concomitant CV risk factors included being a current or former smoker (16.4% and 42.3%, respectively), hypertension (66.7%), diabetes (34.5%) and familial hypercholesterolaemia (5.8%). At baseline, 14.6% of patients were not receiving any LLT. 59.3% of patients were receiving monotherapy, including monotherapies of statin (56.9%), ezetimibe (1.0%), PCSK9i (0.8%), and any other oral LLT (0.6%). Combination therapy was used in 26.2% of patients including 19.0% receiving statin plus ezetimibe, 1.6% PCSK9i combination, and 5.6% any other oral combination therapy.

Table 1. Baseline characteristics and cardiovascular risk factors.

Characteristic	Overall (*N* = 501)
Female, n (%)	123 (24.6)
Age, year, mean (SD)	66.1 (11.07)
BMI, kg/m^2, mean (SD)	28.6 (4.9)
Hypertension, *n* (%)	334 (66.7)
Diabetes, *n* (%)	173 (34.5)
Familial hypercholesterolaemia, *n* (%)	29 (5.8)
ASCVD, *n* (%)	402 (80.2)
Smoking history, *n* (%)	
Current	82 (16.4)5%)
Former	212 (42.3)
Never	204 (40.7)
Missing	3 (0.6)
LDL-C, mg/dL, mean (SD)	80.91 (44.55)
LLT, *n* (%)	
No LLT	73 (14.6)
Statin alone	285 (56.9)
Combination statin + EZE	95 (19.0)
EZE alone	5 (1.0)
PCSK9i alone	4 (0.8)
PCSK9i + Oral LLT	8 (1.6)
Any other oral LLT alone	3 (0.60)
Any other oral combination therapy	28 (5.6)

ASCVD: atherosclerotic cardiovascular disease; BMI: body mass index; EZE: ezetimibe; LDL-C: low-density lipoprotein cholesterol; LLT: lipid-lowering therapy; PCSK9i: poprotein convertase subtilisin kexin 9 inhibitor; SD: standard deviation.

Table 2. Cardiovascular risk classification and type of center of recruitment.

Characteristic	Overall ($N=501$)
Risk classification as reported by investigator, *n* (%)	
High risk	139 (27.7)
Very high risk	362 (72.3)
Basis for risk classification *n* (%)	
Clinical experience	177 (35.3)
ESC/EAS guidelines	309 (61.7)
Regional guidelines	1 (0.2)
National guidelines	3 (0.6)
Other	8 (1.6)
Center of recruitment, *n* (%)[#]	
Primary care	87 (17.4)
Secondary care	461 (92.0)

[#]Some centers are considered both primary and secondary care.
EAS: european atherosclerosis society; ESC: european society of cardiology; SD: standard deviation.

Conclusions: Data suggest that LDL-C remains substantially higher than recommended goals and combination therapies are underutilised in Belgium.

Five-year all-cause mortality of surgical versus transcatheter aortic valve replacement: a Belgian monocentric observational study

Marin Boute, David De Azevedo, Bernhard Gerber, Agnès Pasquet, Anne-Catherine Pouleur, Sophie Pierard, Frédéric Maes, Joëlle Kefer, Laurent de Kerchove and David Vancraeynest

Cliniques Universitaires Saint-Luc, Brussels, Belgium

Background/introduction: Transcatheter aortic valve replacement (TAVR) has become a widespread alternative to surgical aortic valve replacement (SAVR) in high- and intermediate-risk patients with aortic valve stenosis. However, there is ongoing debate regarding the long-term outcomes of TAVR compared to SAVR, especially as TAVR use rises in younger patients.
Purpose: To evaluate and compare the 5-year all-cause mortality between TAVR and SAVR procedures in a real-world Belgian cohort.
Methods: Patients undergoing bioprosthetic aortic valve replacement at a Belgian tertiary care university hospital from January 2010 to December 2020 were included. Exclusions were made for those who underwent transapical/transaortic TAVR or SAVR involving non-CABG associated surgery. Multivariate Cox regression and 1:1 propensity-score matching were used to address baseline characteristic imbalances.
Results: The population included 1183 SAVR and 525 TAVR patients. Notably, TAVR patients were significantly older (84.8 ± 6.4 vs 74.1 ± 8.0 years, $p<0.001$) and presented a higher EuroSCORE II (4.9 [2.9–7.2] vs 2.0 [1.3–3.4] %, $p<0.001$). Propensity-score matching produced a balanced cohort of 446 patients, with a mean age of 81.5 ± 6.3 years and a median EuroSCORE II of 3.5 [2.2–5.5] %.
The TAVR group had a higher 5-year all-cause mortality than SAVR patients (66% vs 20%, HR 4.6, 95%CI 3.7–5.5, $p<0.001$), even after adjusting for the baseline characteristic imbalances with Cox regression (47% vs 22%, HR 2.3, 95%CI 1.8–3.1, $p<0.001$) or propensity-score matching (63% vs 35%, HR 2.1, 95%CI 1.5–3.0, $p<0.001$).
Conclusions: In a real-world Belgian cohort, TAVR was independently associated with a notably higher five-year all-cause mortality compared to SAVR, aligning with findings from large international studies. These pivotal insights into the long-term outcomes of TAVR underscore the need for cautious consideration when expanding its indications, particularly among younger patient populations.

Impact of atrial fibrillation in severe aortic stenosis

David De Azevedo[a], Marin Boute[a], Vincent Hanet[a], Christophe Tribouilloy[b], Sylvestre Maréchaux[c], Yohann Bohbot[b], Dan Rusinaru[b], Alexandre Altes[c], Nicolas Thellier[c], Anne-Catherine Pouleur[a], Christophe Beauloye[a], Agnès Pasquet[a], Bernhard Gerber[a], Jean-Louis Vanoverschelde[a] and David Vancraeynest[a]

[a]Cliniques Universitaires St-Luc, Brussels, Belgium; [b]CHU Amiens, Amiens, France[c]St-Philibert, Lomme, France

Background/introduction: Atrial fibrillation (AF) frequently coexists with aortic stenosis (AS). However, it remains controversial whether AF contributes directly to adverse outcomes as a causal factor or rather as a marker of advanced

cardiac disease. Furthermore, AF can also influence the assessment of AS severity and interfere with the clinical decision to propose an aortic valve replacement (AVR).

Purpose: To evaluate the impact of AF on pre- and postoperative all-cause mortality and on the referral rate to AVR in patients with severe AS.

Methods: Using the Bel-F-ASt registry, 3463 consecutive patients (77 ± 10 years, female 52%) with SAS and LVEF >50% were included in this study. Sinus rhythm (SR) was present in 76.2% of patients and AF in 23.8% of patients. Survival and referral for AVR was adjusted with multivariate cox analysis.

Results: During a median follow-up of 37(IQR:17–60) months, AF-patients had consistently worse 5-year prognosis than SR-patients, regardless of whether they underwent AVR (23.6% vs 36.4% and 75.4% vs 82.0%; $p < 0.001$, respectively for unoperated and operated patients, Figure 1A). After adjustment for time-dependent AVR and for relevant variables, AF remained associated with a worse prognosis (HR:1.21(1.01–1.45); $p = 0.042$, Figures 1B and 2A). Furthermore, both AF and SR patients benefitted from AVR (HR:0.24 (0.20–0.30); $p < 0.001$) with similar magnitude (p for interaction =0.717). However, AF patients were less frequently referred for AVR (72.3% vs. 85.4%; $p < 0.001$, Figure 1C). Even after adjustment for clinical factors influencing referral, AF remained an independent predictor of reduced likelihood of AVR (HR:0.78(0.70–0.86); $p < 0.001$, Figure 2B).

FIGURE 1

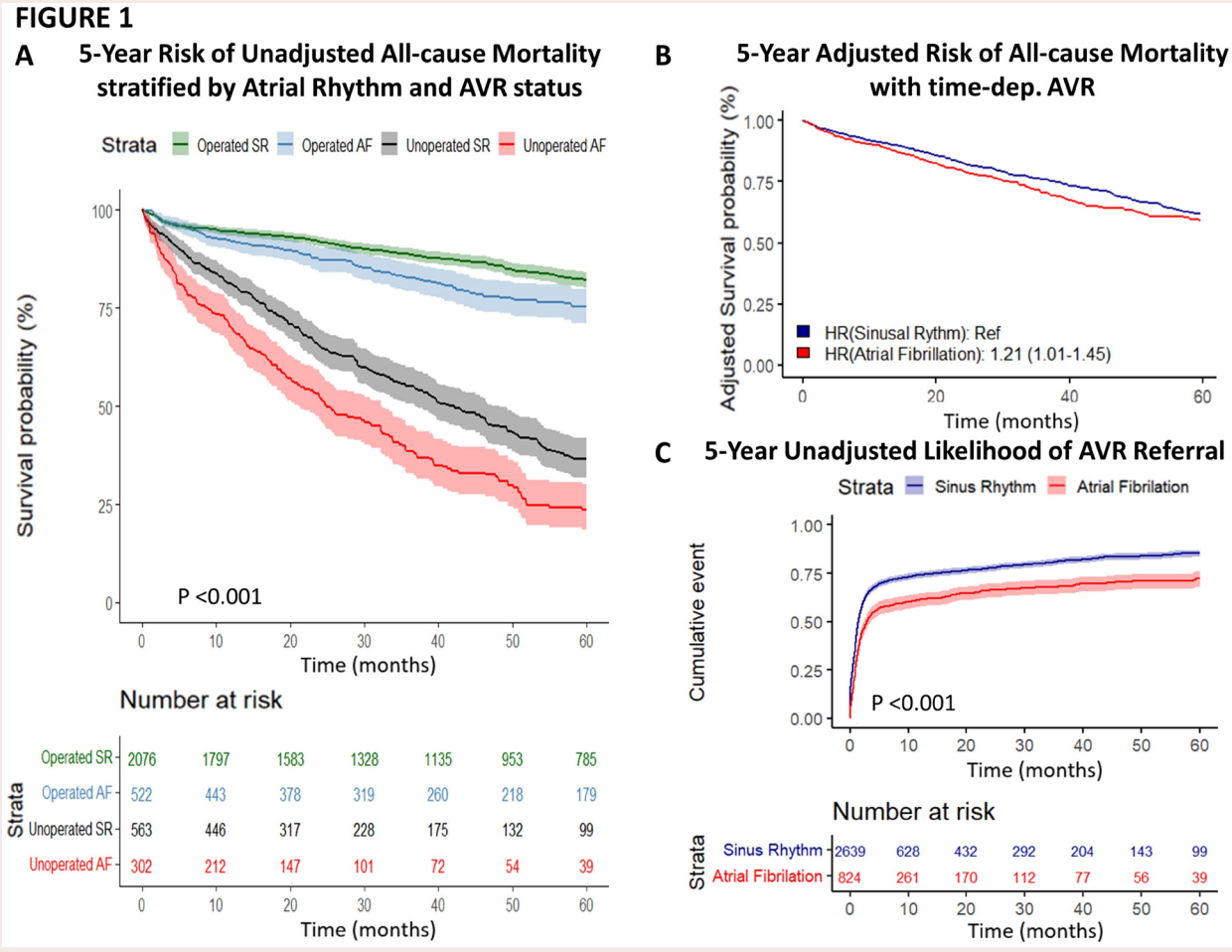
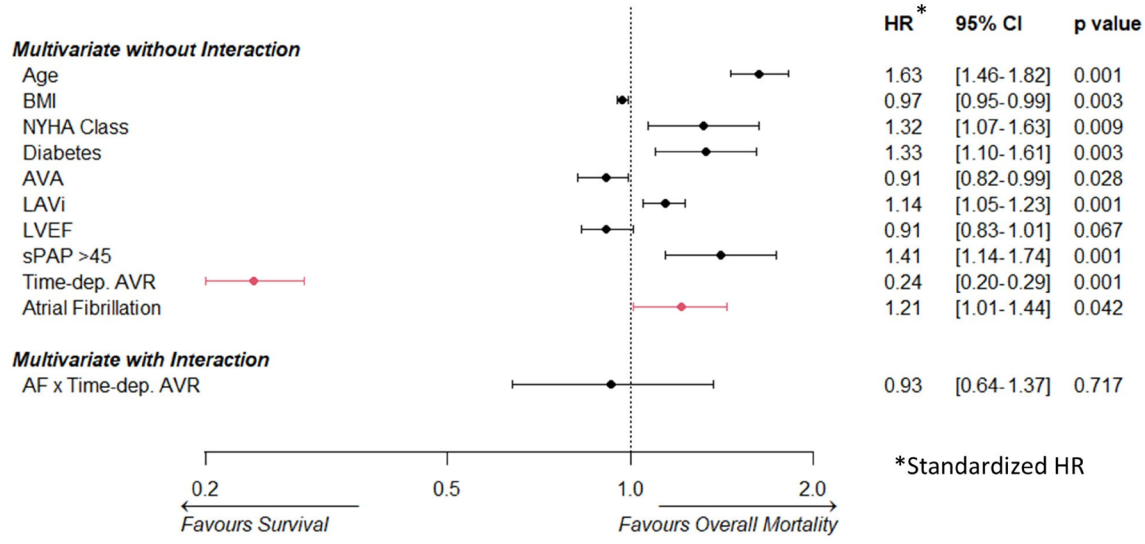
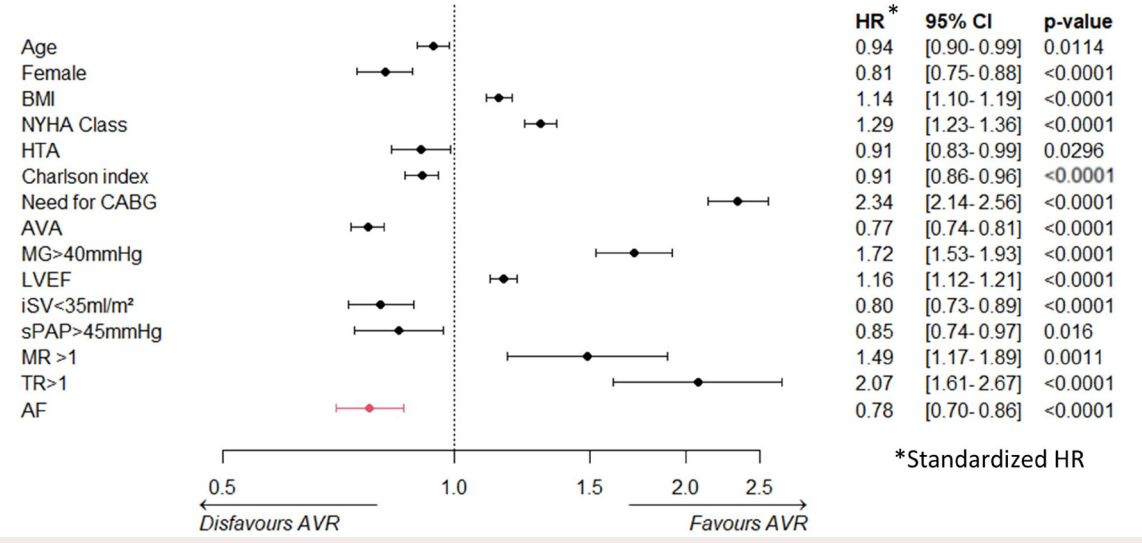


FIGURE 2

A Forest Plot of 5-Year Multivariate Risk of Pre- and Postoperative Mortality



B Forest Plot of 5-Year Multivariate Likelihood of AVR Referral



Conclusions: AF is a marker of poor prognosis in patients with severe AS. Furthermore, AF-patients are less likely to be referred for AVR, even though they benefit from AVR as much as SR-patients. Further prospective studies are needed to elucidate the prognostic impact of AF in AS patients and the exact therapeutic impact of AVR in this specific population.

Prevalence of infective endocarditis in patients with bloodstream infections and deployment of echocardiographic resources in a single-centre registry (#)

Elayne Kelen de Oliveira[a,b], Monika Shumkova[b], Angelo Ratti[b,c], Monika Beles[b], Cristina De Colle[a,b], Pasquale Paolisso[a,b], Ana Moya[a,b], An Boel[b], Kristien Van Vaerenbergh[b], Jerrold Spapen[b], Sofie Brouwers[b], Martin Penicka[b] and Guy Van Camp[b]

[a]University of Naples Federico II, Naples, Italy; [b]Cardiovascular Centre, OLV-Clinic, Aalst, Belgium; [c]University of Milan, Milan, Italy

Background/introduction: The high morbidity and mortality rates of Infective Endocarditis (IE) trigger the necessity to improve the early screening for IE in bloodstream infections (BSIs). In parallel, the allocation of imaging tests must be cost-effective. Although epidemiology can be the basis for raising awareness of high-risk IE patients, data on the IE prevalence according to microbiological aetiology in BSIs remains scarce.
Purpose: To investigate the risk according to microbiological aetiology and echocardiographic screening of IE cases among BSIs.
Methods: A single-centre observational registry between January 2015 and December 2020. All consecutive hospitalised adults with BSIs were included. The echocardiographic screening for IE and the prevalence of definitive IE diagnosis was assessed. All clinically significant hemoculture with the same microorganism during the same hospitalisation was considered one BSI.
Results: Among 3253 BSIs related to 2937 admissions in 2551 patients analysed [75(66–83) years; 1957(59.2%) male], 127(3.9%) BSIs were identified as definite IE. The most prevalent pathogens in BSIs (Figure 1) were *Enterobacterales* (46%), *Staphylococcus aureus* (13.6%), Anaerobic species (6.5%), and *Coagulase-negative staphylococcus* (5.2%). Patients with HACEK BSIs had the highest risk of IE (23.1%) followed by *Listeria spp.* (22.2%), *Streptococcus gallolyticus* (21.2%) and *Enterococcus faecalis* (18.8%). The highest rate of echocardiography screening (Figure 2) occurred in the BSIs caused by *Staphylococcus aureus* with 80.6%, followed by the *Streptococcus gallolyticus* with 78.8%, *Enterococcus faecalis* with 74.4%. Although the higher IE prevalence in the HACEK BSIs, the echocardiographic screening was performed in 69.2% of patients; in the oral streptococci BSIs, it was only conducted in 59.1%. Among BSIs groups without IE cases, echocardiography screening was performed in 31% to 66.7%.

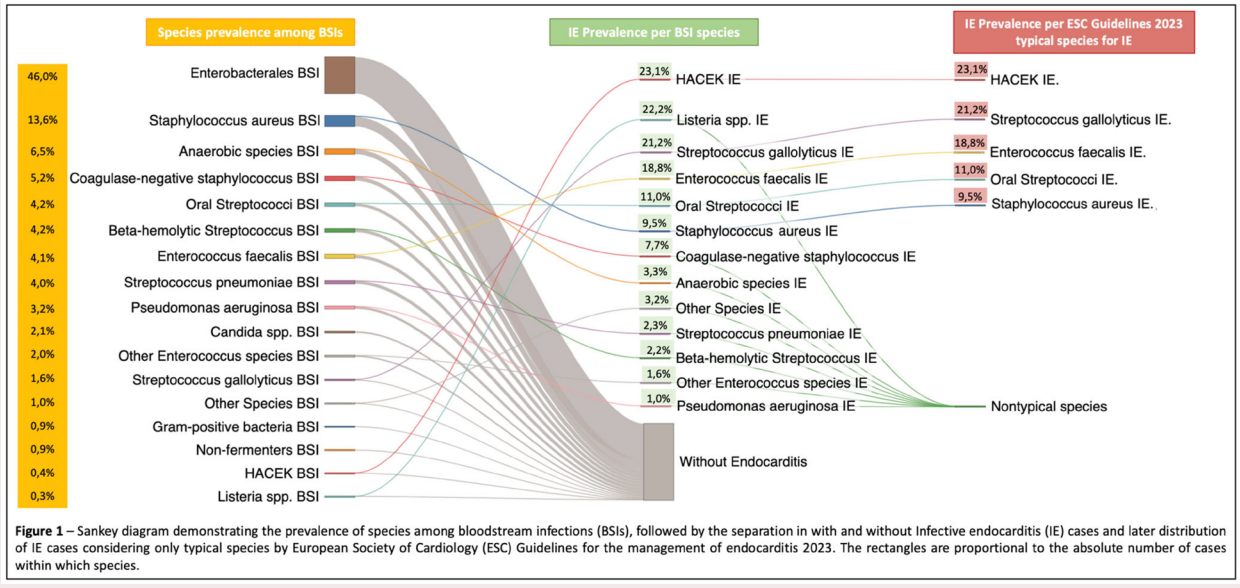


Figure 1 – Sankey diagram demonstrating the prevalence of species among bloodstream infections (BSIs), followed by the separation in with and without Infective endocarditis (IE) cases and later distribution of IE cases considering only typical species by European Society of Cardiology (ESC) Guidelines for the management of endocarditis 2023. The rectangles are proportional to the absolute number of cases within which species.

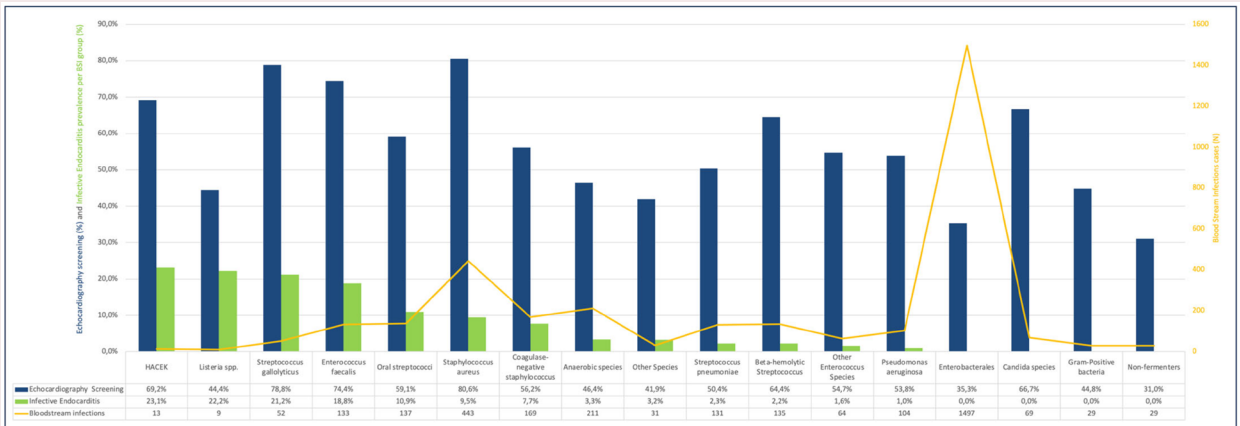


Figure 2 – Echocardiographic screening for infective endocarditis (IE) in bloodstream infections (BSI) per species, prevalence of IE and number of BSI per species.

Conclusions: Our data illustrates a discrepancy between the prevalence of BSI species and their risk of IE. We also showed that echocardiographic screening in patients with BSIs for detecting IE could be optimised considering this discrepancy.

Exercise pulmonary hypertension by the mPAP/CO slope in primary mitral regurgitation

Sebastiaan Dhont[a,b], Jan Stassen[c], Lieven Herbots[c], Ruta Jasaityte[c], Thibault Petit[a], Guido Claessen[c], Petra Nijst[a], Pieter Vandervoort[a], Philippe Bertrand[a] and Jan Verwerft[c]

[a]Ziekenhuis Oost-Limburg, Belgium; [b]Universiteit Gent, Belgium; [c]Jessa Ziekenhuis, Belgium

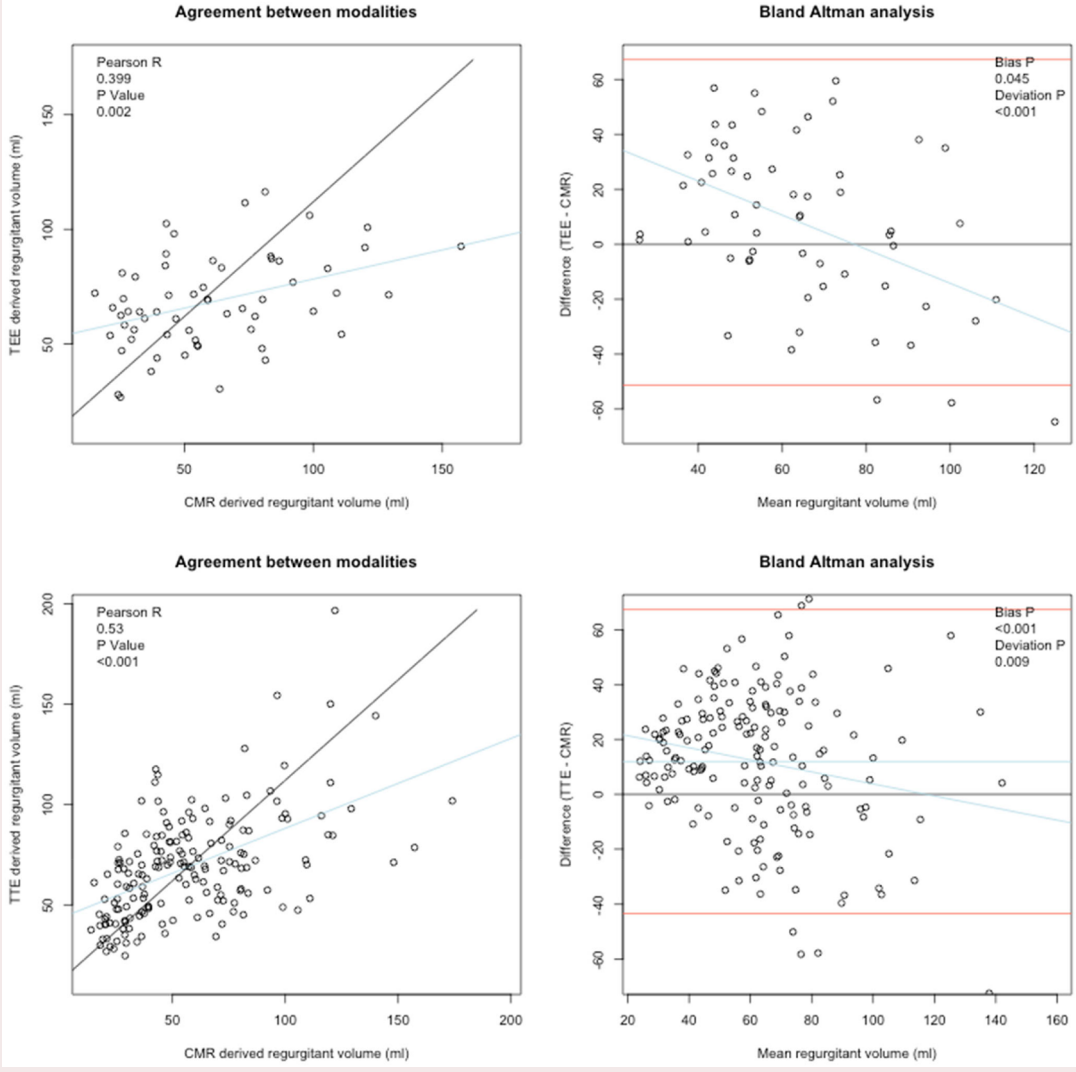
Background/introduction: Determining the right time to intervene in primary mitral regurgitation (MR) is debated. Beyond elucidating the mechanisms and severity of MR, substantial attention is devoted to its consequences, including pulmonary hypertension (PH). Elevated pulmonary arterial pressure (PAP) assessed by echocardiography exceeding 50 mmHg at rest or 60 mmHg during exercise are often used as potential surgical indications. Recently, multipoint measurement of pulmonary arterial pressure (PAP) relative to cardiac output gained attention.
Purpose: The aim of this study is to investigate the value of the mPAP/CO slope in patients with more than moderate primary MR with preserved ejection fraction and no or discordant symptoms.
Methods: A total of 128 consecutive patients were evaluated with exercise echocardiography and cardiopulmonary testing. Clinical outcome was defined as the composite of mitral valve intervention, new-onset atrial fibrillation, cardiovascular hospitalisation, and all-cause mortality.
Results: Mean age was 63 years, 61% male, and mean LVEF 66 ± 6%. The mPAP/CO slope correlated with peak VO_2 ($r = -0.52$, $p < 0.001$), while peak sPAP did not ($r = -0.06$, $p = 0.584$). Forty-six percent ($n = 59$) had peak exercise sPAP ≥60 mmHg, and 37% ($n = 47$) had mPAP/CO slope >3 mmHg/L/min. Event-free survival was 55% at 1-year and 46% at 2-years, with reduced survival in patients with mPAP/CO slope >3 mmHg/L/min (HR 4.9, 95%CI 2.9–8.2, $p < 0.001$). In 53 cases (41%), mPAP/CO slope and peak sPAP were discordant: Patients with slope >3 mmHg/L/mmHg and sPAP <60 mmHg ($n = 21$) had worse outcome versus peak sPAP ≥60 mmHg and normal slope ($n = 32$, log-rank $p = 0.003$). The mPAP/CO slope improved predictive models for outcome, incremental to resting and exercise sPAP, and peak VO_2.
Conclusions: Exercise PH defined by the mPAP/CO slope >3 mmHg/L/min is associated with decreased exercise capacity and higher risk of adverse events in significant primary MR and no or discordant symptoms. The slope provides a greater prognostic value than single sPAP measures and peak VO_2.

Assessing aortic regurgitation with echocardiography: towards a better agreement with magnetic resonance

Vincent Hanet, David de Azevedo, Marin Boute, David Vancraeynest and Bernharg Gerber

Cliniques Universitaires Saint Luc, Brussels, Belgium

Background/introduction: Discrepancies were described between transthoracic echocardiography (TTE) and cardiac magnetic resonance (CMR) assessment of aortic regurgitation (AR) severity. However, we still don't know if transesophageal echocardiography (TEE) allows a better agreement with CMR.
Purpose: To compare TEE assessment of AR severity using vena contracta, effective regurgitant orifice area (ERO) and proximal flow convergence method (PISA) with CMR assessment by phase contrast imaging (PCI) and confront CMR and echo thresholds for severe AR.
Methods: Among 266 patients retrospectively studied who underwent CMR and TTE examinations, 186 were confirmed to have at least moderate AR. 104 patients had an additional TEE and PISA measurements were possible in 64 (60%). We compared AR severity parameters including vena contracta, ERO and regurgitant volume (RegVol) according to PISA method to CMR quantification with PCI.
Results: Correlations for AR severity assessment was weak between CMR PCI and TEE when using RegVol, ERO or vena contracta (Pearson r of respectively 0.382, 0.356 and 0.306). Looking at RegVol, bias and deviation were similar between both TEE and TTE with CMR and agreement between TTE and TEE was better for RV measurement ($r=0.514$) suggesting this bias may be linked to the PISA computation. Comparing echocardiographic techniques, the best correlation with CMR derived RegVol were left ventricular diastolic volumes computed by biplane Simpson's method ($r=0.819$), behind corresponding CMR volumetric measurements ($r=0.854$). PISA-derived Grade IV AR were predicted by CMR thresholds for regurgitant fraction and volume of respectively 32% (Spe 0.69; Sen 68) and 38 ml (Spe =0.76; Sen =0.68).



Conclusions:

	Correlations with CMR	Reg. Fraction		Reg. Volume	
		Pearson R	P Value	Pearson R	P Value
TTE	LVDd	0.645	0.000	0.655	0.000
	LVDs	0.535	0.000	0.484	0.000
	EDV	0.64	0.000	0.819	0.000
	ESV	0.629	0.000	0.685	0.000
	iEDV	0.649	0.000	0.832	0.000
	iESV	0.635	0.000	0.681	0.000
	EF (Simpson)	0.246	0.058	0.084	0.523
	SV (Simpson)	0.490	0.000	0.743	0.000
	SV (LVOT)	0.399	0.002	0.660	0.000
	Vena Contracta	0.290	0.026	0.367	0.004
	PHT	0.212	0.104	0.167	0.202
	PISA radius	0.294	0.023	0.325	0.011
	ERO	0.255	0.049	0.246	0.058
	VTI (AR)	0.097	0.462	0.075	0.567
	RV (PISA)	0.203	0.120	0.363	0.004
TEE	Vena Contracta	0.328	0.010	0.301	0.019
	PISA radius	0.142	0.279	0.171	0.191
	ERO	0.321	0.013	0.355	0.005
	VTI (AR)	0.046	0.730	0.060	0.648
	RV (PISA)	0.281	0.030	0.399	0.002
CMR	EDV	0.649	0.000	0.854	0.000
	ESV	0.741	0.000	0.774	0.000
	iEDV	0.634	0.000	0.840	0.000
	iESV	0.746	0.000	0.771	0.000
	EF	0.498	0.000	0.216	0.097
	SV (PCI)	0.396	0.002	0.742	0.000
	RegFract			0.862	0.000
	RegVol	0.862	0.000		

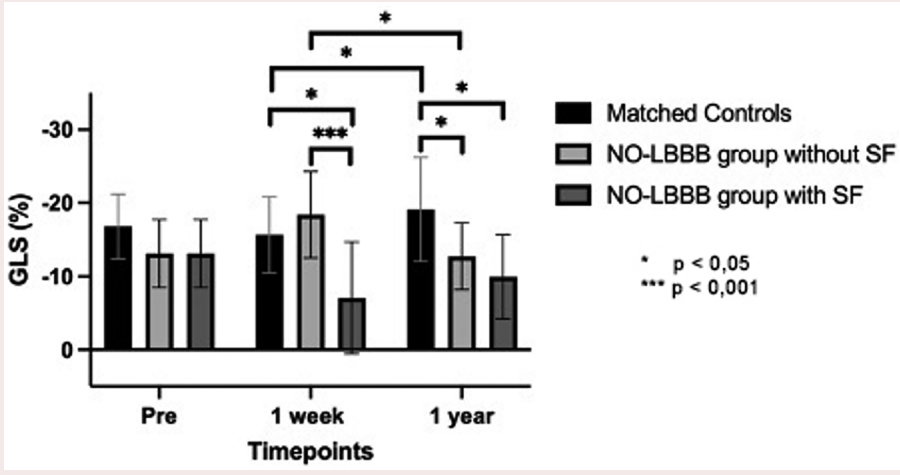
There is a weak correlation between PISA method and CMR-PCI in AR quantification. The correlation of CMR-derived regurgitant volume and fraction with left ventricular volume measurements makes it a crucial parameter in the assessment of AR severity. CMR thresholds for severe AR are lower than in echocardiography.

Effects of TAVI induced left bundle branch block on left ventricular function

Paul Van Herck[a], Wim Huybrechts[a], Elise Van Genechten[b], Frederic De Roeck[a], Tom Vandendriessche[a], Inez Rodrigus[a] and Johan Bosmans[a]

[a]Antwerp University Hospital, Edegem, Belgium; [b]University of Antwerp, Edegem, Belgium

Background/introduction: After transcatheter aortic valve implantation (TAVI), the development of new-onset left bundle branch block (NO-LBBB) is seen in up to 50% of cases. A NO-LBBB can lead to heart failure.
Purpose: The objective of the study is to examine the effect of NO-LBBB development after TAVI on left ventricular (LV) function.
Methods: A retrospective study on patients that underwent a TAVI from 2015 to 2020 at the Antwerp University hospital was performed. Patients that developed NO-LBBB were compared to a matched control group. NO-LBBB patients were divided in patients with and without septal flash (SF). LV strain analysis on echocardiography (GLS) was measured pre TAVI, at 1 week post TAVI and at 1 year post TAVI. Clinical outcome and 1-year survival were also examined.
Results: Of the 187 included patients 26 patients developed a NO-LBBB. Pre TAVI these patients already had a lower GLS than the matched control group ($n=26$) (−13.10% ± 4.63 vs. −16.80% ± 4.38; $p=0.005$). In total 11 patients of the NO-LBBB group developed SF. There was a significant difference in GLS between the three groups ($p<0.001$), with both the controls (−15.65% ± 5.16) and the no-SF group (−18.40% ± 5.87) having a significantly higher value than the SF group (−7.07% ± 7.60).



These differences were still present at the 1-year follow-up, with the exception that the NO-LBBB group without SF now had a lower GLS and thus was significantly different from the controls ($p=0.014$) and not the SF group. At the 1-year follow-up there was an improvement of the GLS for the matched controls. No significant differences were seen for the clinical outcomes or the 1-year survival.
Conclusions: NO-LBBB development after TAVI leads to worse LV function at 1 year follow up. Clinical consequences should be assessed in further long term studies.

VASCULAR DISEASES, HYPERTENSION

Vitamin D deficiency worsens pulmonary hypertension in an experimental rat model

Bilal El Fahsi[a], Géraldine Hubesch[b], Aliénor Hanthazi[c], Emeline Hupkens[b], Grégory Vegh[b], Pascale Jespers[b], Céline Dewachter[d] and Laurence Dewachter[b]

[a]ULB, Brussels, Belgium; [b]Laboratory of Physiology and Pharmacology, Brussels, Belgium; [c]FAMHP/AFMPS, Brussels, Belgium; [d]Erasme-ULB, Brussels, Belgium

Background/introduction: Nutritional deficiencies, including in vitamin D, are described in patients with pulmonary arterial hypertension (PAH). PAH patients with low vitamin D levels have a worse prognosis.
Purpose: We hypothesised that vitamin D deficiency in a rat model of pulmonary hypertension (PH) could worsen hemodynamics, endothelial dysfunction and inflammation.
Methods: Male Wistar rats were fed either a vitamin D-free ($n=6$) or standard diet ($n=9$) for 4 weeks. One week after specific diet initiation, four rats randomly selected from each group were given a single intraperitoneal dose of monocrotaline (MCT; 40 mg/kg) to induce PH. Finally, hemodynamics (assessed by catheterisation), right ventricular (RV) hypertrophy, pulmonary artery (PA) morphometry and pathobiology were analysed, as well as PA contractility *ex vivo*.
Results: In rats fed with vitamin D-free diet, circulating serum 25-hydroxyvitamin D levels were below 10 ng/ml, indicating vitamin D deficiency. In MCT-injected rats, vitamin D deficiency exacerbated PH, with increased RV systolic pressure (78 ± 9 versus 63 ± 3 mmHg, $p<0.05$), mean PA pressure (58 ± 9 versus 39 ± 4 mmHg, $p<0.05$) and RV hypertrophy (assessed by Fulton index calculated as the ratio of the [RV/(left ventricle + septum) weights]). Vitamin D deficiency did not alter PA remodelling and *ex vivo* PA relaxation to acetylcholine in MCT-PH rats. In the lungs of MCT-PH rats, gene expression of endothelin type A receptor (ETA) increased, while expressions of endothelin type B receptor (ETB), endothelial and inducible nitric oxide synthases remained unchanged. Pro-inflammatory interleukin(IL)6/IL10 ratio, macrophage-specific marker CD68 and vascular cell adhesion molecule (VCAM) were upregulated in MCT-PH lungs, while expressions of IL-1beta and intercellular adhesion molecule were similar. At pathobiological level, vitamin D deficiency did not alter these lung gene expressions in PH-MCT rats.
Conclusions: Vitamin D deficiency aggravates MCT-induced experimental PH in rats, worsening hemodynamic parameters. However, underlying mechanisms remain unclear and require further study.

The association between 24-h blood pressure variability and major adverse cardiac events (MACE) in hospitalised patients with acute myocardial infarction: a prospective study

Imane Katif, Saloua Karimi and Mustapha Hattaoui

Cardiology Department of the Mohamed VI CHU, Marrakech, Morocco

Background/introduction: Blood pressure (BP) variability is a dynamic phenomenon, it is considered a novel risk factor for cardiovascular disease. It can be estimated by different blood pressure (BP) devices (mainly ambulatory BP monitoring [ABPM]). Patients with acute coronary syndrome (ACS) often show vasomotor instability, which increases the tendency of exaggerated responses to antihypertensive treatment, with BP fluctuating up and down early during ACS management.
Purpose: The aim of the present study was to assess the relationship between in-hospital BP variability and MACE in patients with acute myocardiac infraction.
Methods: Patients with ACS were included in the study Between September 2022 and february 2023, 121 patients were hospitalised in the cardiology departement in ARRAZI hospital, CHU MOHAMED VI, MARRAKECH,. BPV index was defined as the weighted standard deviation (SD) of 24-hour BP. All patients were followed up for an average of 7 days during their hospital stay. Clinical outcome was evaluated through the monitoring of major adverse cardiac events (MACE) occurring at any time during in-hospital follow
Results: MACE was obtained in 13 patients consisting of three patients with malignant arrhythmias, seven patients with acute heart failure, two patients with cardiac arrest, and three patients with cardiogenic shock. The mean BPV in AMI patients with high blood pressure was significantly higher than in patients without HBP and the mean BPV in AMI patients with hypertension who experienced MACE was significantly higher than in patients without hypertension who experienced MACE. However, the BPV was significantly more important for HBP patient who experienced MACE than HBP patients didn't experienced MACE
Conclusions: BPV could be an important risk factor for in-hospital MACE in patients with ACS especially in patients with a history of HBP, wich leads us to think that the screening of BPV in HBP patient may be very useful in predecting MACE.

What can we learn from our experience with type A acute aortic dissection? (#)

Luc Rubirigi[a], David Willain[b], Claudiu Ungureanu[a], Olivier Descamps[c] and Antoine De Meester De Ravestein[a]

[a]Centre Hospitalier Universitaire HELORA, Cardiology Department, La Louvière, Belgium; [b]Centre Hospitalier Universitaire HELORA, Radiology Department, La Louvière, Belgium; [c]Centre Hospitalier Universitaire HELORA, Internal Medicine Department, La Louvière, Belgium

Background/introduction: Acute aortic dissection (AAD) type A is a rare condition associated with high morbidity and mortality, especially when diagnosis is delayed. However, the prognosis can significantly improve with early intervention. Immediate surgical treatment is recommended in the acute setting, while prophylactic surgery is suggested when the aortic root diameter reaches 5.5 cm.
Purpose: To provide an overview of the current state of AAD concerning clinical presentation, management, and outcomes.
Methods: This retrospective study analysed patients admitted for AAD from 2016 to 2022, identified through our hospital's Minimum Clinical Data (MKG/RCM) database of our hospital. Exclusion criteria included suspected AAD diagnoses without confirmation and type B AAD (17 patients excluded).
Results: ***Baseline characteristics.***A total of 35 patients were included (69 ± 13 years; 60% men). The main risk factors were hypertension (77%), dyslipidemia (60%), atherosclerotic carotid or coronary diseases (43%), previously known aortic ectasia (32%), prior cardiac surgery (17%), and connective tissue pathology (6%).
AAD characteristics. Only 49% presented with typical clinical symptoms, but all had elevated D-dimer levels (>500 ng/ml). The mean aortic root diameter was 4.5 ± 1.2 cm.
Outcomes. In-hospital mortality was high at 38%, with an average hospital stay of 14 ± 16 days. A comparison of treatments demonstrated a significant reduction in mortality among patients receiving invasive treatment compared to those managed conservatively (25% vs 64%; $p = 0.03$). However, patients who survived the acute hospital phase had a 91% survival rate after 3 years of follow-up.
Conclusions: The high 3-year survival rate and decreased hospital mortality emphasise the importance of early surgical intervention.
Size alone should not be the sole criterion for prophylactic surgery, as dissections can occur below the 5.5 cm surgical threshold. Additional factors, such as other morphologic data, biomarkers, or genetics, should also be considered.

Endothelial damage and homeostasis in a vaccinated COVID 19 population: different variant, similar vascular pattern (*)

Margherita Tiezzi[a], Charbel Haddad[b], Valerie Vandenbempt[b], Desli Shahini[a], Javier Negueruela Escudero[b], Anne Van Praet[b], Audrey Godefroid[b], Véronique Corbière[b], Tatiana Takiishi[b], Philippe van de Borne[a] and Alessandra K. Cardozo[b]

[a]Hôpital Erasme, Brussels, Belgium; [b]ULB, Brussels, Belgium

Background/introduction: The recent COVID 19 pandemic represented an occasion to study the link between viral infections and vascular impairment. The first waves of the disease were characterised by severe respiratory involvement and increased cardiovascular complications. Cytokine release and direct viral action on vessels were pointed out as the main causes of endothelial damage, but no potential therapeutic targets have been identified. Over time, new variants and mass vaccination drastically changed the clinical spectrum of the disease, reducing mortality and cardiovascular complications. However, we could speculate that a dysruption of vascular homeostasis still exists in vaccinated patients infected with other variants, albeit to a lesser extent.
Purpose: Our project focused on a recent COVID 19 population ('omicron' cohort, as it is infected mostly with SARS-CoV-2 omicron variant), with the aim to characterise endothelial homeostasis during the symptomatic phase.
Methods: We first performed the enumeration of circulating endothelial cells in peripheral blood and analysed ACE2 expression on their surface. Then, we assessed the toxicity of COVID 19 serum on endothelial cells *in vitro*. And last, we performed a proteomic analysis to check for possible up/downregulated pathways acting on vascular homeostasis. Both the *in vitro* experiments and the proteomics analysis results were compared with samples from 2020.
Results: SARS-CoV-2 'omicron' patients show a significant increase in mature and progenitor endothelial cells during the acute phase, without signs of ACE2 upregulation. They also display a dignificant upregulation of key proteins involved in the severe cases of the disease (IL-6, TRAIL-R2, PTX3), albeit to a lesser extent and without the involvement of renin angiotensin system. However, this is not mirrored by endothelial toxicity *in vitro*.
Conclusions: SARS-CoV-2 'omicron' patients display altered endothelial homeostasis and the upregulation of key proteins involved in severe COVID 19 disease. In this population, no signs of Renin Angiotensin System activation are found.