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For andre år på rad i pandemien ble kongressen vår arrangert digitalt (bare en kortversjon i fjor: EAPC Essentials4You 2020). Denne gang var kongressen godt forberedt med mye støtte på et virkelig høyt profesjonelt nivå, både faglig og teknisk.

Kongressen ble intensivt promotert blant annet med denne videoen: https://www.facebook.com/europeansocietyofcardiology/videos/182227656831841/

ESC Preventive Cardiology (tidligere EuroPrevent) er European Association of Preventive Cardiologys (EAPCs) årlige kongress for alle kardiologer, helsearbeidere og unge og gamle forskere med interesse for ulike aspekter innen forebygging, epidemiologi, populasjonsstudier, folkehelse, hjerterehabilitering, sportskardiologi og translasjonsforskning. Noen foredrag til fellessesjonene var direkte. Foredragene til parallellsesjoner med inviterte foredragsholdere var innspilt på forhånd, men med en felles direktediskusjon etterpå. Abstraktene til muntlig presentasjon ble holdt direkte og med spørsmål enten via diskusjonsfunksjon («chatte») og formidlet fra møteledere, eller direkte fra møtelederne. Alle posterne lå lett tilgjengelig organisert på nettsiden under tema. Alle bidragene er søkbare og ligger tilgjengelig online på ESC 365. Neste års kongress planlegges for Praha, og det diskuteres om det skal holdes som en hybridkongress.

Det var totalt 1367 betalende deltakere fra 85 land, og av disse var 22 fra Norge. Gledelig er at hele 52 % av totalt antall deltakerne var under 40 år. Det var en nedgang fra 46 fra Norge på digitalkongressen i 2020 og 36 fra Norge på kongressen i Lisboa i 2019. I tillegg kom fakultetsmedlemmene hvorav fire var norske: Trine Moholdt som holdt to presentasjoner (Management of childhood cardiometabolic risks: role of lifestyle, Pharmacological treatment vs exercise to manage hypertension), Erik Ekker Solberg som holdt en presentasjon (Essentials of sports cardiology), Anne Grete Semb som holdt to presentasjoner (Joint management of familial hypercholesterolemia by primary and secondary care, Keep communicating: from primary care to long-term prevention), og undertegnede som holdt en presentasjon (e-Cigarette: have its promises vaporised) og deltok som møteleder på en sesjon (Moderated abstracts - Population Science and Public Health).

Det ble presentert seks norske abstrakter av: Mads Svenningsson (foredrag som deltaker i Young Investigators Award: Trimetyllysine and risk of new-onset atrial fibrillation in two large Norwegian cohorts), Oscar Kristiansen (ePoster: High but not low self-reported statin adherence was confirmed by a novel method based on plasma-statin measurements in coronary outpatients), Elise Sverre (ePoster: Tailored clinical management after blinded statin challenge improved long-term lipid control in coronary patients with self-percieved muscle side-effects), Nils Tore Vethe (e-Poster: A novel direct method to determine adherence to simvastatin therapy in patients with coronary heart disease), Heidi Elstad (ePoster: Digital secondary prevention follow-up after percutaneous coronary intervention (PCI) at home: what are the users perspective?) og Hilde Bergum (e-Poster: Long-term effects

of multiple lifestyle intervention on major cardiovascular risk factors among high risk subjects: a meta-analysis). Disse abstraktene er gjengitt nederst i dette innlegget.

EAPC og European Journal of Preventive Cardiology

Et medlemskap i EAPC kan enkelt skaffes online via nettstedet www.escardio.org/EAPC. Som for ESC for øvrig, er det fire nivåer for medlemskap med ulike kostnader og fordeler. For de unge er det en egen «EAPC Young Community» med lavere registreringsavgift, muligheter for representasjon i EAPC, nettverkstiltak og faglige tiltak. EAPC er inndelt i fire seksjoner under styret EAPC Board: Primary care and risk factor management, Population science and public health, Secondary prevention and rehabilitation og Sports cardiology and exercise. I tillegg er det fem komiteer for Advocacy, Education, Congress, Membership og Research. Det skrives flere artikler hvert år i samarbeid på tvers og langs i organisasjonen som ofte ender i posisjonsrapporter/intensjonsrapporter («position papers»). Mange av de aktive medlemmene deltar i skriving av retningslinjer. Man kan nominere seg selv når det er valg, og det stemmes blant medlemmene. Det er norske aktive representanter i mange ledd av EAPC.

European Journal of Preventive Cardiology https://academic.oup.com/eurjpc er det offisielle tidsskriftet for EAPC, og ny forlegger fra 1. januar i år er Oxford University Press. Det er verdens viktigste tidsskrift med denne profilen og er klassifisert som et nivå 2-tidsskrift. Sjefredaktør er italienske Massimo F. Piepoli, og tre av redaktørene er norske. Impact factor er økende og er nå 5,864.

EAPC Core Curriculum for Preventive Cardiology

Det første europeiske kjernepensum for preventiv kardiologi ble lansert under kongressen og er også publisert som en artikkel https://doi.org/10.1093/eurjpc/zwab017 med Matthias Wilhelm og medforfattere. Det dekker hele spekteret av preventiv kardiologi både på individuelt nivå og populasjonsnivå gjennom hele livet. Promotering av god hjertehelse inkludert risikofaktorer og forebygging og behandling av risikofaktorer, både når det gjelder primærforebygging, sekundærforebygging, rehabilitering og sprotskardiologi, er grundig dekket. Målet er at dette kjernepensum skal danne grunnlaget for en subspesialitet i preventiv kardiologi i Europa ved å standardisere utdannelsen og gjøre det til en attraktiv karrierevei for unge kardiologer og annet relevant helsepersonell.

Highlights of Population science and public health

P. Marques-Vidal fra Sveits presenterte høydepunktene og startet med å fokusere på luftforurensning målt som NO_2 fra fossilt brensel i 398 byer fra både lav- og høyinntekstland som risikofaktorer for hjerte- og karsykdom. Både totaldød og hjerte- og kardød øker med nivå av NO_2 (Meng X et al, BMJ 2021). Studien indikerer at helseeffekter kan oppnås ved reduserte nivåer av NO_2. Videre viser en stor sveitsisk studie at nattlig støy fra flytrafikk rundt en stor flyplass øker hjerte- og kardødeligheten (OR 1,44 (1,03-2,04). Tilskrivbar risikofraksjon ble beregnet til å være 3 % (Saucy A et al, Eur Heart J 2021). Også sosial ulikhet i helse ble nevnt og med henvisning til betydningen for helse som nabolaget man bor i har (Marmot M et al Am J Public Health 2014).

Highlights of the EAPC Young Community

H. T. Jorstad fra Nedeland viste til det betydelige bidraget til kongressen fra deltakere under 40 år, med 295 abstrakter, 54 foredrag, 241 ePostere og 9 kliniske kasuistikker. Han nevnte følgende bidrag: Lav skjelettmuskeltetthet kombinert med nedsatt muskelfunksjon predikerer komplikasjoner etter hjerte- og karkirurgi (M. Yamashita). En meta-analyse av sju studier viser at økt kondisjon reduserer atrieflimmerinsidens, i motsetning til hva flere enkeltstudier har vist (C. Verdicchio). Tolv ukers intensiv trening under supervisjon av unge pasienter med hypertrofisk kardiomyopati viser at slik trening er trygg og bedrer kondisjonen, men at pasientene etter seks måneder har mistet bedring av kondisjonen fordi de har sluttet å trene (J. Basu). En norske studie (E. Sverre) viser at å snakke med pasienter som

rapporterer muskelsmerter pga. statiner, etter at de har vært eksponert for statiner i en overkryssingsstudie, kan forbedre bruken av statiner og bedre lipidkontrollen. Til slutt viste en studie (Batod) hvor mye CO_2 som ble spart fordi man holdt en digital kongress. 11156 tonn ble spart på flytrafikk og 20 tonn ble spart på drosejturer som ikke ble utført.

Plutselig uventet død hos atleter, screening med bildediagnostikk

S. Caselli fra Sveits holdt et innlegg om screening av idrettsutøvere for å forebygge plutselig uventet død (Pellicia A et al, Eur Heart J 2018, D'Ascenzi et al Eur J Prev Cardkiol 2020, Børjesson M et al Eur Heart J 2018). De vanligste årsakene som oppdages er unormalt forløp av koronararterier, aortasykdommer, mitralprolaps, bikuspid aortaklaff og medfødt hjertefeil. Vanlig standard anbefaling som screening er klinisk evaluering og EKG samt ekkokardiografi bare ved symptomer. Klinisk evaluering og EKG bør gjentas hvert år eller hvert annet år. Caselli slår også et slag for å bruke mer ekkokardiografi også i ungdommen når man starter toppidrett, og så igjen ved 35-årsalder, deretter ved symptomer eller funn som arytmier, negativ T-bølge og mistanke om myokarditt.

Nutrition essentials

T. F. Luscher fra Sveits holdt et morsomt innlegg om vin, sjokolade og kaffe. Han viste til en fersk, stor epidemiologisk studie (Csengeri D et al, Eur Heart J 2021) som viser at det er en dose-respons mellom alkoholkonsum og atrieflimmer helt fra meget lavt konsum. I Interheart-studien (Leong DP et al, Circulation 2014) fant man en omvendt dose-respons mellom alkohol og insidens av hjerteinfarkt, men dette funnet ble (dessverre) ikke bekreftet i en relativt fersk studie (GBD Lancet 2016) som viste at alkohol i små doser beskyttet mot iskemisk hjertesykdom, men så ble det en sterkt økt risiko ved høyere konsum.

P. Marques-Vidal fra Sveits snakket intenst om ulike spesialdietter og hjerte- og karrisiko (Alcorta A et al, Foods 2021). Han viste til at vegansk diett, paleodiett og intermitterende faste (Allaf M et al, Cochrane 2021) kan ha gunstig effekt på noen risikofaktorer, men ikke på harde endepunkt som sykdom og død. Vegetarisk diett, derimot, er vist i mange studier å redusere risiko for hjerteinfarkt, men ikke for hjerneslag.

NORSKE ABSTRAKTER PRESENTERT PÅ ONLINE-KONGRESSEN ESC PREVENTIVE CARDIOLOGY 2021

Trimetyllysine and risk of new-onset atrial fibrillation in two large Norwegian cohorts

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Increased plasma trimetyllysine (TML), a methylated amino acid, has recently been linked to higher risk of acute myocardial infarction (AMI). TML is also a precursor of trimethylamine-N oxide (TMAO), which has been linked to increased cardiovascular risk, including that of atrial fibrillation (AF). We investigated the association between TML and new-onset AF in two large Norwegian cohorts.

Methods: The primary cohort consisted of 6396 participants in the community-based Hordaland Health Study (HUSK). The validation cohort consisted of 2027 patients who underwent coronary angiography due to suspected stable angina pectoris in the Western Norway Coronary Angiography Cohort (WECAC). Information on new-onset AF was obtained by linking patient data to Norwegian public health registries. Risk associations were explored by Cox regression.

Results: During median (25th-75th percentile) follow-up of 10.9 (10.6-11.3) and 7.0 (6.3-8.6) years, 560 (8.8%) patients in the HUSK and 210 (10.4%) in the WECAC was diagnosed with AF.

In the HUSK, the age and gender adjusted HR (95 % CI) for the 4th vs. 1st plasma TML quartiles 1.84 (1.37-2.48) p<0.001. In multivariable models the association was only slightly attenuated. Correspondingsly, the age and gender adjusted HR (95% CI) for the 4th vs. 1st TML quartiles in the WECAC was 1.48 (0.96-2.27) p=0.07.

Testing for collinearity between TMAO and TML revealed variance inflation factors between 1.0-1.1 in HUSK and WECAC, thus ruling out collinearity.

Conclusion: Plasma TML was associated with new-onset AF among subjects from the general population, and the relationship was independent from established AF risk factors. A similar trend was also seen in patients with suspected stable angina pectoris, strengthening our findings, which motivate further studies to explore potential pathophysiological relationships between one-carbon metabolism and cardiac arrhythmias.

High but not low self-reported statin adherence was confirmed by a novel method based on plasma-statin measurements in coronary outpatients.

O Kristiansen[1] , E Sverre[1] , K Peersen[2] , MW Fagerland[3] , E Gjertsen[1] , L Gullestad[4] , J Perk[5] , T Dammen[6] , E Husebye[1] , NT Vethe[7] , J Munkhaugen[1] , [1]Drammen Hospital - Drammen - Norway , [2]Vestfold Hospital Trust, Department of Cardiology - Tønsberg - Norway , [3]Oslo University Hospital, Section for Biostatistics and Epidemiology, Oslo centre for Biostatistics - Oslo - Norway , [4]Oslo University Hospital Rikshospitalet, Department of Cardiology - Oslo - Norway , [5]Linnaeus University, Faculty of Health Sciences - Kalmar - Sweden, [6]University of Oslo, Department of Behavioural Medicine - Oslo - Norway , [7]Oslo University Hospital, Deparment of Pharmacology - Oslo - Norway ,

Background: To what extent self-reported adherence measures correspond with directly measured statin adherence is unknown.

Purpose: To determine the relationship between, self-reported adherence measures, low density lipoprotein-cholesterol (LDL-C) and directly measured statin adherence in coronary outpatients.

Methods: Patients on atorvastatin (N=373) participated in a cross-sectional study median 16 months after a coronary event. Adherence to statins the past 7 days, general medication adherence assessed by the 8-item Morisky medication adherence scale (MMAS-8), and the Gehi adherence question was obtained by a self-report questionnaire. Atorvastatin was determined in spot blood plasma samples by a novel liquid-chromatography tandem mass-spectrometry method discriminating between adherence (0-1 doses omitted) and reduced (=2 doses omitted) adherence. Participants were unaware of the atorvastatin analyses at study participation.

Results: Mean age was 63 (SD 9) years and 19% were females. Mean atorvastatin dose was 64 (SD 21) mg. The number with reduced adherence by the different measurement methods, Cohens kappa agreement score between the self-

	Directly measured atorvastatin adherence	Self-reported statin adherence past 7 days	Self-reported medication adherence past month (Gehi)	8-item Morisky medication adherence scale
Number with reduced adherence, %	7.8	5.5	3.0	8.4
Cohen's kappa (95% CI)	Reference	0.4 (0.2 to 0.6)	0.3 (0.1 to 0.5)	0.2 (0.1 to 0.4)
LDL-C, Adherent, mean (95% CI)	1.9 (1.8 to 1.9)	1.9 (1.8 to 2.0)	1.9 (1.8 to 2.0)	1.9 (1.8 to 1.9)
LDL-C, Reduced adherence, mean (95% CI)	2.8 (2.4 to 3.2)	2.8 (2.3 to 3.2)	3.2 (2.5 to 3.8)	2.1 (1.9 to 2.4)
LDL-C, Adherent versus reduced adherence	P <0.001	P=0.001	P=0.004	P=0.07

Agreement between directly measured atorvastatin adherence, self-reported measures of adherence, and mean low density lipoprotein-cholesterol (LDL-C)

reported and direct adherence measures, and LDL-C are shown in the Table. Statin adherence was confirmed by the direct method among 96% reporting high statin adherence the past 7 days, among 95% reporting high adherence on the MMAS-8 and among 94% reporting high adherence on the Gehi adherence question. In contrast, among patients classified with reduced statin adherence by the direct method, only 40% reported reduced statin adherence the past week, 32% reported reduced adherence with the MMAS-8 and 22% with the Gehi adherence question.

Conclusions: The direct method confirmed high, but not low, self-reported statin adherence in this selected sample of coronary outpatients. In patients with elevated LDL-cholesterol, plasma-statin measurements emerges as a potential improvement for clinical statin management.

Tailored clinical management after blinded statin challenge improved long-term lipid control in coronary patients with self-perceived muscle side-effects

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Background: Statin discontinuation due to self-perceived muscle side-effects is a major challenge in clinical practice. Strategies are needed to improve lipid control in these patients.

Purpose: We studied if information about the results of a blinded statin challenge experiment, followed by tailored lipid lowering treatment, had long-term effects on lipid control in coronary patients with self-perceived muscle side-effects.

Methods: A post-trial intervention study of patients classified with statin dependent (N=20) and independent (N=50) muscle complaints in the MUscle Side-Effects of atorvastatin (MUSE), a randomized, double-blinded, crossover trial. All participants were informed of the MUSE trial results in an individual consultation and provided tailored lipid-lowering treatment according to protocol with 1-2 follow-up calls. Lipids were controlled at the end of follow-up.

Results: Mean age was 64 (SD 9.5) years and 33% (N=23) were females. During an average follow-up of 13 months (SD 3.3), mean LDL-cholesterol was reduced by 0.3 (SD 0.6) mmol/L (p=0.005) in patients with statins and by 1.7 (SD 1.0) mmol/L (p=0.005) in patients without statins at inclusion in the MUSE trial (Table). We found no changes in the overall use of high-intensity statins, but ezetimibe was used by 11 additional patients and 4 patients were prescribed a PCSK9-inhibitor. Participants in the subgroup without statins at inclusion used; atorvastatin (N=2), rosuvastatin (N=3) or a PCSK9-inhibitor (N=2) at follow-up. 90% found their own trial results useful in making decisions about future statin use.

Conclusions: Information about the results of a statin challenge experiment combined with tailored and systematical prescription of lipid-lowering agents had favourable long-term effects on lipid control in coronary patients with self-perceived muscle side-effects.

	Using statins at inclusion (n=62)	Not using statins at inclusion (n=8)
Classified with statin-dependent side-effects, n (%)	15 (24)	5 (63)
LDL-cholesterol at inclusion, mean (SD)	2.2 (0.8)	4.2 (1.1)
LDL-cholesterol at follow-up, mean (SD)	1.9 (0.7)	2.5 (0.8)
High intensity statin (ie. ≥40 mg atorvastatin or ≥20 mg rosuvastatin) at inclusion, n (%)	40 (55.6)	0 (0)
High intensity statin at follow-up, n (%)	38 (61)	2 (25)
Ezetimibe at inclusion, n (%)	13 (21)	3 (38)
Ezetimibe at follow-up, n (%)	26 (42)	1 (13)
PCSK-9 inhibitor at follow-up, n (%)	2 (3)	2 (25)
Usefulness of own trial result in making decisions about future statin use on a 0 to 10 Likert scale, mean (SD)		

A novel direct method to determine adherence to simvastatin therapy in patients with coronary heart disease.

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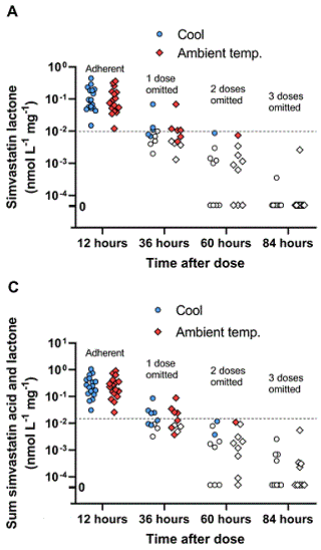
Background: Poor adherence to statin therapy remains a public health concern associated with adverse clinical outcome. Reliable classification and detection of statin adherence is needed in clinical practice and for clinical studies with overall aim to improve the lipid management. Simvastatin is a frequently used statin in cardiovascular disease prevention.

Purpose: To develop a feasible test based on spot blood samples to monitor the adherence to simvastatin therapy in coronary heart disease (CHD) patients.

Methods: Eighteen CHD patients on an evening dose of simvastatin 20 mg (n=7), 40 mg (n=5) and 80 mg (n=6) were studied at steady-state pharmacokinetics. Ten patients were instructed to avoid simvastatin dosing and return for blood sampling the subsequent three days. Dose-normalized plasma concentrations of simvastatin lactone, simvastatin acid and the sum of the two were evaluated as discriminators between adherent dosing and dose avoidance. Bioanalytical quantifications were performed with liquid chromatography tandem mass spectrometry.

Results: The dose-normalized plasma concentrations at steady-state demonstrated 23-fold and 39-fold interindividual variabilities for simvastatin lactone and simvastatin acid. A simvastatin acid cut-off at 1.0·10^-2 nmol/L/mg identified 100% of those omitting 2 doses and 60% of those omitting a single dose (Figure 1). Simvastatin acid showed superior ability to discriminate dose avoidance from adherence, and also the best agreement between samples handled at ambient and cool temperature (median deviation 3.5%, interquartile range -2.5 to 13%). A cut-off for morning dose schedule, with similar ability to discriminate, was estimated at 2.0·10^-3 nmol/L/mg.

Conclusion: A novel method discriminating between good and poor adherence to simvastatin therapy in CHD patients has been developed. The sample handling is feasible for routine practice, and the assessment of adherence can be performed by direct measurements in spot blood samples, according to specific cut-off values.



Digital secondary prevention follow-up after percutaneous coronary intervention (PCI) at home: what are the users perspectives?

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Digital Secondary Prevention Follow-up After Percutaneous Coronary Intervention (PCI) at Home:

What are the Users Perspectives?

Background: Secondary prevention for patients with established CHD is the mainstay of cardiovascular rehabilitation, but is not accessible to all eligible patients. Digital delivery offers a way to widen participation in secondary prevention to PCI patients, but little is known about users' preferences.

Purpose: The purpose of this qualitative study was to explore service users, carers and health professionals views about potential challenges experienced in secondary prevention after PCI and preferences for support to inform the development of a digital home program.

Methods: A series of three focus group interviews were conducted in a broad user panel with former PCI patients (4), next-of-kin (1) and interdisciplinary health care professionals (4) between March 2017 and September 2019. Data was audiotaped, transcribed verbatim and analysed using content analysis.

Results: Three main themes and sub-themes on challenges and preferences for digital follow-up were identified: (1) Technology: feasibility including safety, integration with known platforms, functionality, and user-friendly navigation were major assets, as well as the capability of monitoring medication adherence, smoking cessation and physical activity. (2) Communication: interactive, direct, clear, supportive, encouraging, visualizing, humorous, using virtual meeting rooms, as well as including direct responses on patients' self-motivation and achieved goals and (3) Health information: basic step-by-step facts and questions-and-answers (FAQ), being practical, visual, and including side effects of medications and health services navigation.

Conclusion: User perspectives from former patients, next-of-kin and health care professionals reveal a preference for digital secondary prevention which offers functionality, communication, and health information during follow-up at home after a PCI.

Long-term effects (>24 months) of multiple lifestyle intervention on major cardiovascular risk factors among high risk subjects: a meta-analysis

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Background: The evidence of the long-term effects of multiple lifestyle intervention on cardiovascular risk is uncertain. We aimed to summarize the evidence from randomized clinical trials examining the efficacy of lifestyle intervention on major cardiovascular risk factors in subjects at high cardiovascular risk.

Methods: Eligible trials investigated the impact of lifestyle intervention versus usual care with minimum 24 months follow-up, reporting more than one major cardiovascular risk factor. A literature search updated April 15, 2020 identified 12 eligible studies. The results from individual trials were combined using fixed and random effect models, using the standardized mean difference (SMD) to estimate effect sizes. Small-study effect was evaluated, and heterogeneity between studies examined by subgroup and meta-regression analyses considering patient- and study-level variables.

Results: Small-study effect was not identified. Lifestyle intervention reduced systolic blood pressure modestly with an estimated SMD of -0.13, 95% confidence interval (CI): -0.21 to -0.04, with moderate heterogeneity (I^2 = 59%), corresponding to a mean difference of approximately 2 mmHg (MD = -1.86, 95% CI: -3.14 to -0.57, p = 0.0046). This effect disappeared in the subgroup of trials judged at low risk of bias (SMD = 0.02, 95% CI: -0.08 to 0.11). For the outcome total cholesterol SMD was -0.06, 95% CI: -0.13 to 0.00, with no heterogeneity (I^2 = 0%), indicating no effect of the intervention.

Conclusion: Lifestyle intervention resulted in only a modest effect on systolic blood pressure and no effect on total cholesterol after 24 months. Further lifestyle trials should consider the challenge of maintaining larger long-term benefits to ensure impact on cardiovascular outcomes.