Dear Reader,

We are honoured to present you the 3rd issue of "The State of the Heart", which explores the clinical evidence supporting the new understandings and happenings in the field of cardiology.

In India, the epidemiological transition from predominantly infectious disease conditions to non-communicable diseases has occurred over a rather succinct period of time. Despite wide heterogeneity in the prevalence of cardiovascular risk factors across different regions, CVD has emerged as the leading cause of death in all parts of India, including poorer states and rural areas. In this research driven time, management of these disorders is also constantly evolving towards the betterment whether it's pharmacological or non-pharmacological.

Being a healthcare custodian of the society, clinicians are constantly thriving to be abreast with the novel understandings of disease and its management. In this context, this is our initiative to provide you a compiled and to the point information.

Present booklet comprises of recent and latest deeds in the field of cardiovascular diseases like dyslipidemia, coronary artery disease, heart failure and its management. We hope that it will facilitate increased cooperation and innovation, and enthuse commitment to prevent these life-threatening and disabling disorders and providing the best possible care for people who suffer from these conditions.

Editor in chief

Dr. Dixit Patel (MBBS, MD)

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1. Prevalence and control of CV risk factors in CAD patients in India compared with the rest of the world: CLARIFY registry

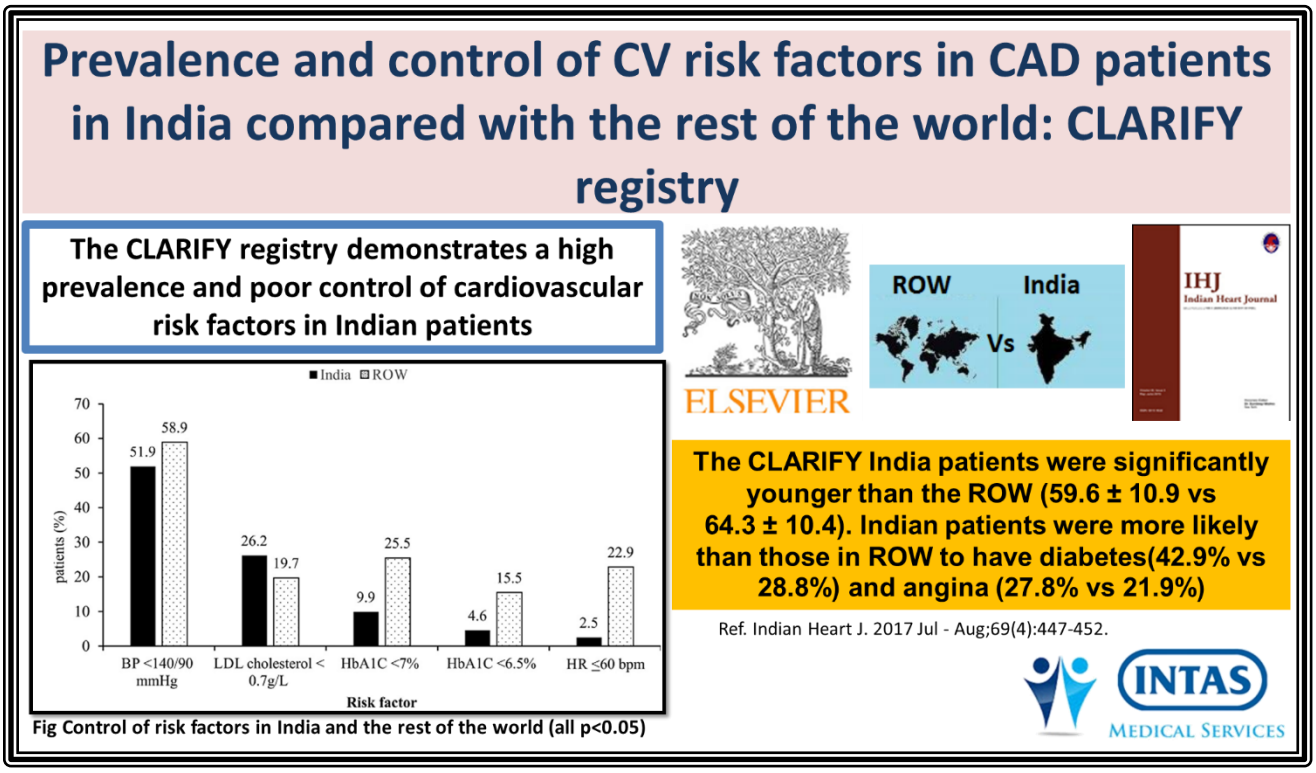


Fig Control of risk factors in India and the rest of the world (all p<0.05)

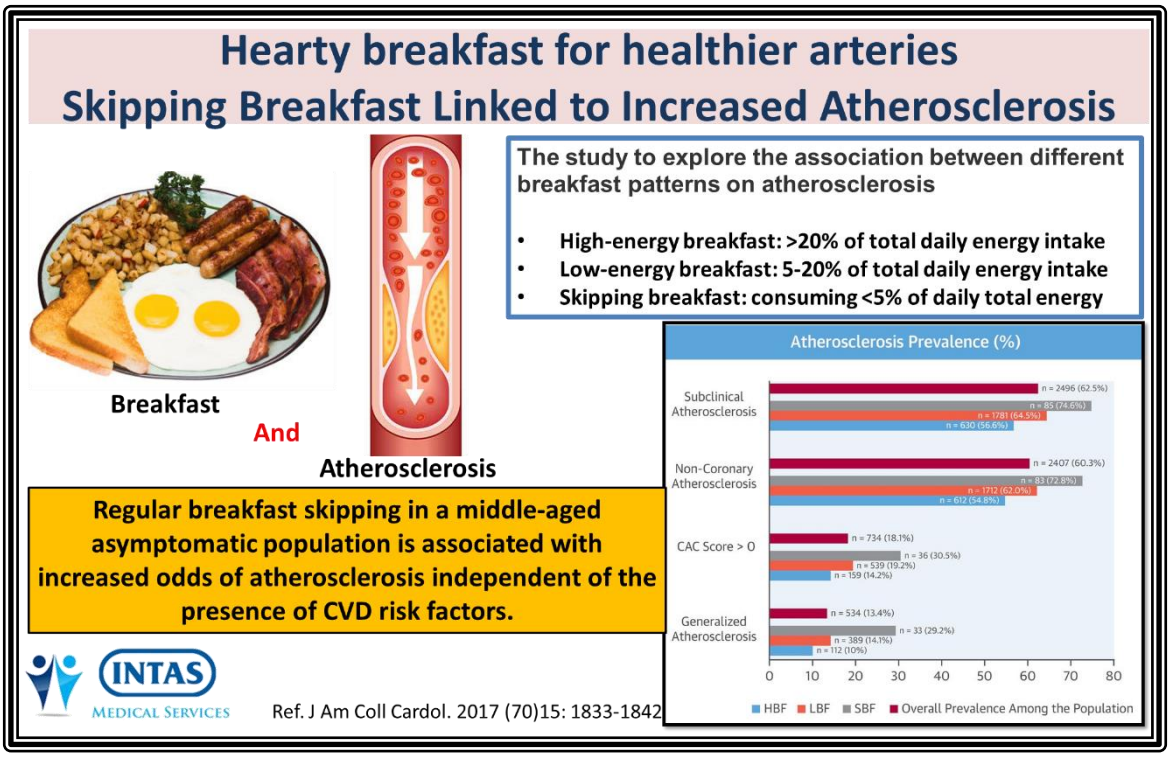
OBJECTIVES: We describe the clinical characteristics, prevalence and control of coronary artery disease (CAD) risk factors of the Indian cohort enrolled in the CLARIFY registry and compare them with data from rest of the world (ROW).

METHODS: CLARIFY is an international, prospective, observational, longitudinal cohort study in stable CAD outpatients. The baseline data of Indian cohort (n=709) were compared to ROW (n=31994).

RESULTS: The CLARIFY India patients were significantly younger than the ROW (59.6±10.9 vs 64.3±10.4). Indian patients were more likely than those in ROW to have diabetes (42.9% vs 28.8%) and angina (27.8% vs 21.9%). Mean heart rate was significantly greater in Indians measured by either palpatory method (76.1±10.4 vs 68.0±10.5) or ECG (74.9±12.9 vs 67.0±11.3). The use of aspirin (85.6% vs 87.8%), β-blockers (69.4% vs 75.4%), and lipid-lowering agents (90% vs 92.4%) was lower in India. A significantly greater proportion of patients in India exhibited low HDL cholesterol (41.6% vs 31.2%), and heart rate ≥70bpm (82.2% vs 48.5%). The risk factors control was poor in India with heart rate goal of ≤60bpm achieved in 2.5%; HbA1c <7% in 9.9%; and HbA1c <6.5% in 4.6% patients.

CONCLUSION: The CLARIFY registry demonstrates a high prevalence and poor control of cardiovascular risk factors in Indian patients. Systematic efforts to improve risk factor control are required.

2. Hearty breakfast for healthier arteries Skipping Breakfast Linked to Increased Atherosclerosis



Background: Daily habits, including the number and quality of eating occasions, are potential targets for primary prevention strategies with large health impacts. Skipping breakfast is considered a frequent and unhealthy habit associated with an increased cardiovascular (CV) risk.

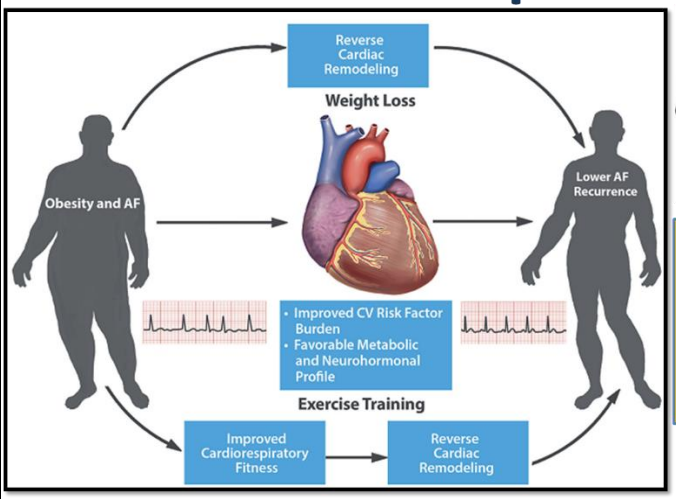
Objectives: The study sought to explore the association between different breakfast patterns and CV risk factors and the presence, distribution, and extension of subclinical atherosclerosis.

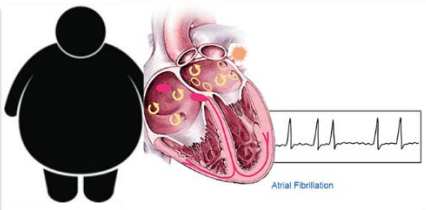
Methods: Cross-sectional analysis was performed within the PESA (Progression of Early Subclinical Atherosclerosis) study, a prospective cohort of asymptomatic (free of CV events at baseline) adults 40 to 54 years of age. Lifestyle and multivascular imaging data along with clinical covariates were collected from 4,052 participants. Multivariate logistic regression models were used in the analysis.

Results: Three patterns of breakfast consumption were studied: high-energy breakfast, when contributing to >20% of total daily energy intake (27% of the population); low-energy breakfast, when contributing between 5% and 20% of total daily energy intake (70% of the population); and skipping breakfast, when consuming <5% of total daily energy (3% of the population). Independent of the presence of traditional and dietary CV risk factors, and compared with high-energy breakfast, habitual skipping breakfast was associated with a higher prevalence of noncoronary (odds ratio: 1.55; 95% confidence interval: 0.97 to 2.46) and generalized (odds ratio: 2.57; 95% confidence interval: 1.54 to 4.31) atherosclerosis.

Conclusion: Skipping breakfast is associated with an increased odds of prevalent noncoronary and generalized atherosclerosis independently of the presence of conventional CV risk factors.

3. Effects of Weight Loss and Exercise in Obese patients with AF





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Despite the presence of an obesity paradox, there are benefits of weight loss, physical activity/exercise training, and increases in cardiorespiratoryfitness on the prognosis of obese patients with AF.

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Fig. Proposed mechanism of benefits of weight loss and exercise training to reduce atrialfibrillation.

Ref. J Am Coll Cardiol 2017;70:2022–35

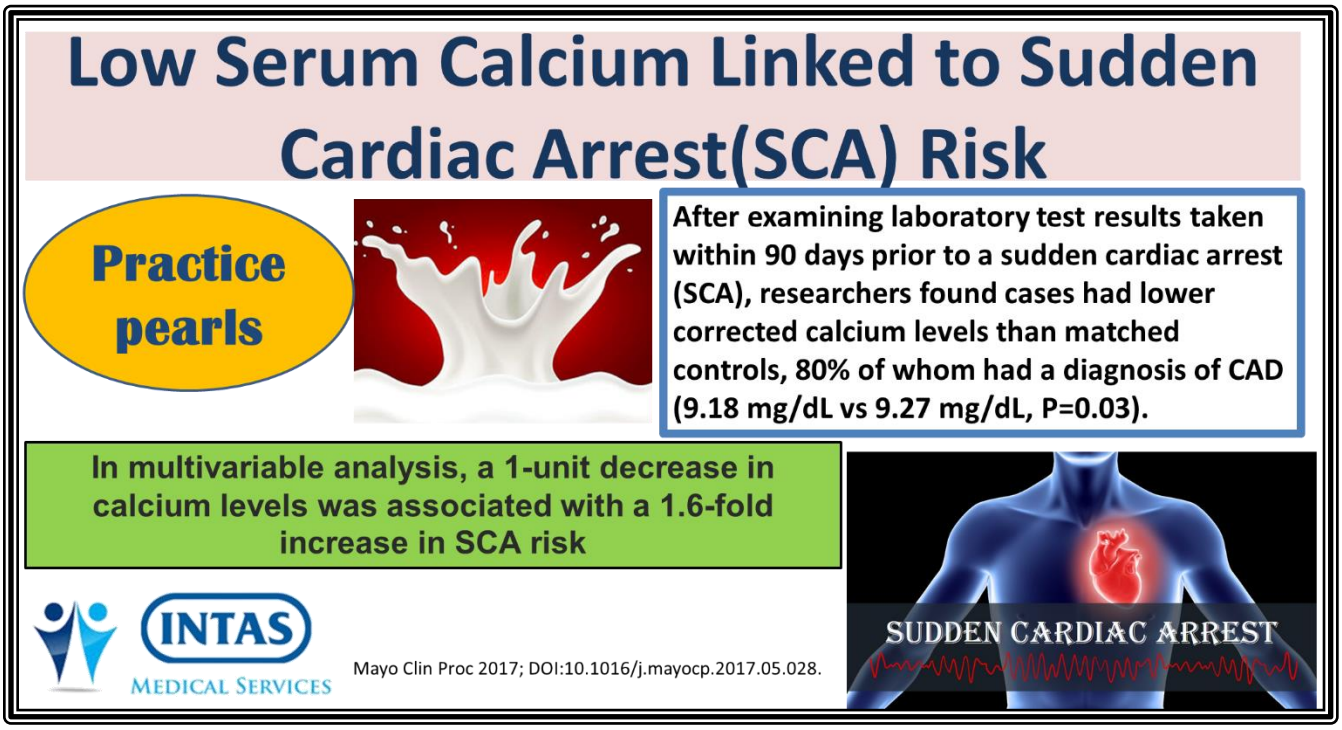
Abstract

Both obesity and atrial fibrillation (AF) are increasing in epidemic proportions, and both increase the prevalence of cardiovascular disease events. Obesity has adverse effects on cardiovascular hemodynamics and cardiac structure and function, and increases the prevalence of AF, partly related to electroanatomic remodeling in obese patients.

However, numerous studies, including in AF, have demonstrated an obesity paradox, where overweight and obese patients with these disorders have a better prognosis than do leaner patients with the same degree of severity of cardiovascular disease/AF.

In this paper, the authors discuss special issues regarding AF in obesity, as well as the evidence that despite the presence of an obesity paradox, there are benefits of weight loss, physical activity/exercise training, and increases in cardiorespiratory fitness on the prognosis of obese patients with AF.

4. Low Serum Calcium Linked to Sudden Cardiac Arrest(SCA) Risk



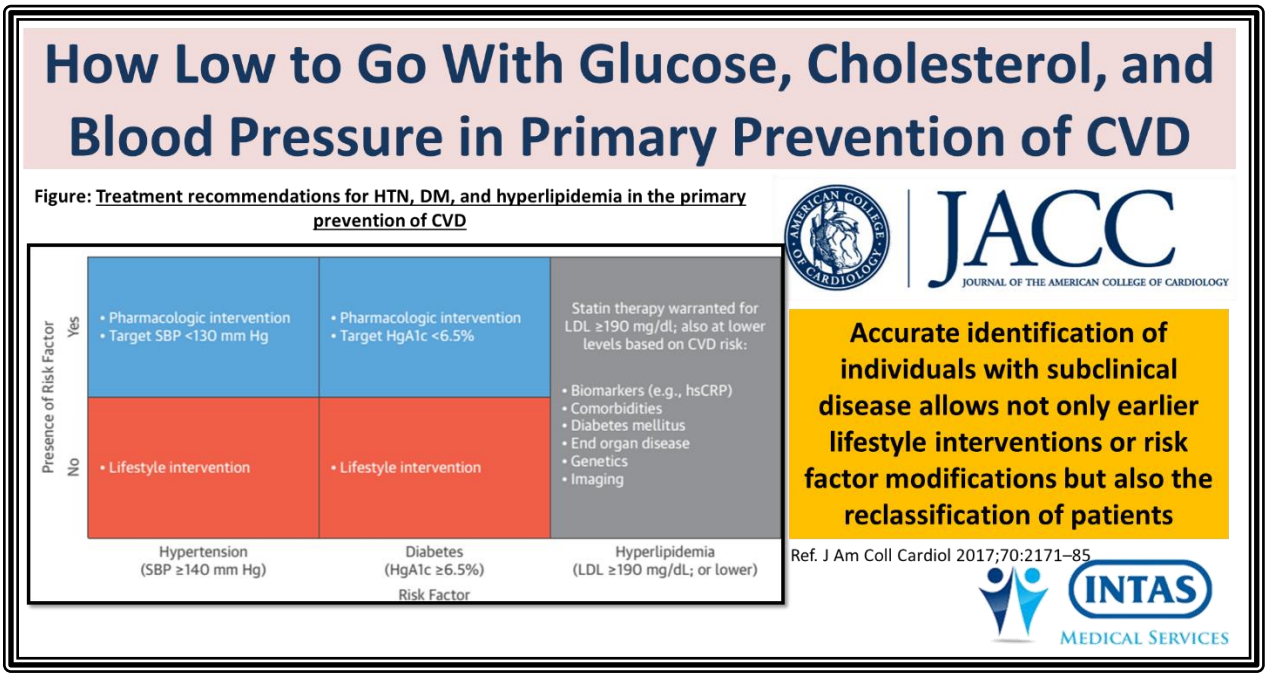
OBJECTIVE: To evaluate the potential role of low serum Ca levels in the occurrence of sudden cardiac arrest (SCA) in the community.

PATIENTS AND METHODS: We compared 267 SCA cases [177 (66%) men] and 445 controls [314 (71%) men] from a large population-based study (catchment population ~1 million individuals) in the US Northwest from February 1, 2002, through December 31, 2015. Patients were included if their age was 18 years or older with available creatinine clearance (CrCl) and serum electrolyte levels for analyses to enable adjustment for renal function. For cases, creatinine clearance and electrolyte levels were required to be measured within 90 days of the SCA event.

RESULTS: Cases of SCA had higher proportions of blacks [31 (12%) vs 14 (3%); P<.001], diabetes mellitus [122 (46%) vs 126 (28%); P<.001], and chronic kidney disease [102 (38%) vs 73 (16%); P<.001] than did controls. In multivariable logistic regression analysis, a 1-unit decrease in Ca levels was associated with a 1.6-fold increase in odds of SCA (odds ratio, 1.63; 95% CI, 1.06-2.51). Blood Ca levels lower than 8.95 mg/dL (to convert to mmol/L, multiply by 0.025) were associated with a 2.3-fold increase in odds of SCA as compared with levels higher than 9.55 mg/dL (odds ratio, 2.33; 95% CI, 1.17-4.61). Cases of SCA had significantly prolonged corrected QT intervals on the 12-lead electrocardiogram than did controls (465±37 ms vs 425±33 ms; P<.001).

CONCLUSION: Lower serum Ca levels were independently associated with an increased risk of SCA in the community.

5. How Low to Go With Glucose, Cholesterol, and Blood Pressure in Primary Prevention of CVD

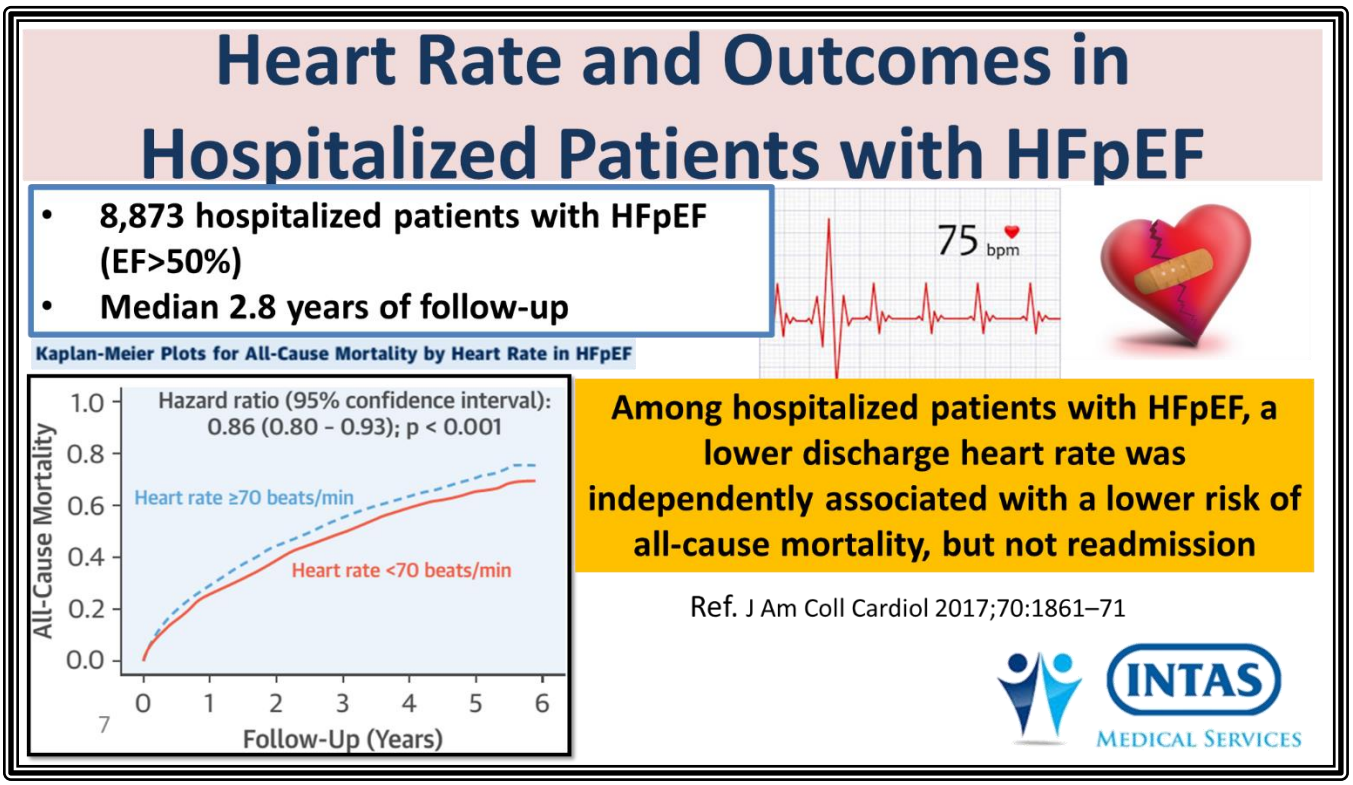


Abstract

Diabetes, hyperlipidemia, and hypertension are modifiable risk factors that predict cardiovascular disease events. The effect of these risk factors on incident cardiovascular disease increases with progressively higher levels of glucose, low-density lipoprotein cholesterol, and blood pressure. The thresholds for initiating treatment of these modifiable risk factors and the optimal goals of risk factor modification are a focus of primary prevention research. Although an aggressive approach is appealing, adverse events may occur, and potential physiological barriers may exist. This paper discusses primary prevention of coronary heart disease that may be achieved through modification of diabetes, hyperlipidemia, and hypertension by summarizing current guidelines and pertinent clinical trial data from intervention trials that included a primary prevention cohort.

Although it is attractive to consider pharmacological therapies in lower-risk patients, adverse effects and physiological barriers may make the risk–benefit ratio unfavorable, particularly if adherence to medications is affected. Appropriate selection of individuals who will benefit from more aggressive pharmacological therapies will hinge on the accuracy of CVD risk calculators. Lifestyle and behavioral interventions, although difficult to implement and adopt, do not have this lower limit and should be the intervention for the lowest-risk groups.

6. Heart Rate and Outcomes in Hospitalized Patients with HFpEF



BACKGROUND A lower heart rate is associated with better outcomes in patients with heart failure (HF) with reduced ejection fraction (EF). Less is known about this association in patients with HF with preserved ejection fraction (HFpEF).

OBJECTIVES The aims of this study were to examine associations of discharge heart rate with outcomes in hospitalized patients with HFpEF.

METHODS Of the 8,873 hospitalized patients with HFpEF (EF $50%) in the Medicare-linked OPTIMIZE-HF (Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure) registry, 6,286 had a stable heart rate, defined as #20 beats/min variation between admission and discharge. Of these, 2,369 (38%) had a discharge heart rate of <70 beats/min. Propensity scores for discharge heart rate <70 beats/min, estimated for each of the 6,286 patients, were used to assemble a cohort of 2,031 pairs of patients with heart rate <70 versus $70 beats/min, balanced on 58 baseline characteristics.

RESULTS The 4,062 matched patients had a mean age of 79 10 years, 66% were women, and 10% were African American. During 6 years (median 2.8 years) of follow-up, all-cause mortality was 65% versus 70% for matched patients with a discharge heart rate <70 versus $70 beats/min, respectively (hazard ratio [HR]: 0.86; 95% confidence interval [CI]: 0.80 to 0.93; p < 0.001). A heart rate <70 beats/min was also associated with a lower risk for the combined endpoint of HF readmission or all-cause mortality (HR: 0.90; 95% CI: 0.84 to 0.96; p ¼ 0.002), but not with HF readmission (HR: 0.93; 95% CI: 0.85 to 1.01) or all-cause readmission (HR: 1.01; 95% CI: 0.95 to 1.08). Similar associations were observed regardless of heart rhythm or receipt of beta-blockers.

CONCLUSIONS Among hospitalized patients with HFpEF, a lower discharge heart rate was independently associated with a lower risk of all-cause mortality, but not readmission.

7. Statins May Help Guard Against S Aureus Bacteremia

Statins May Help Guard Against S Aureus Bacteremia

Enrolled 2638 patients with first-time community-acquired (CA-SAB) and 26,379 matched population controls

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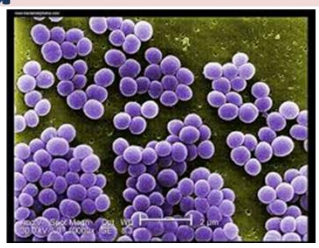

Statin use	Adjusted odds ratio (95% CI)
Former use	1.12 (0.94–1.32)
Current use	0.73 (0.63–0.84)
New use	0.96 (0.60–1.51)
Long-term use	0.71 (0.62–0.82)

Table. Adjusted Risk of CA-SAB With Statin Use

Compared with nonusers, current statin users had a markedly decreased risk of CA-SAB, with long-term use, defined as multiple prescriptions across more than 90 days, offering the greatest protection.

*Ref. Mayo Clin Proc*2017; 92:1469-1478

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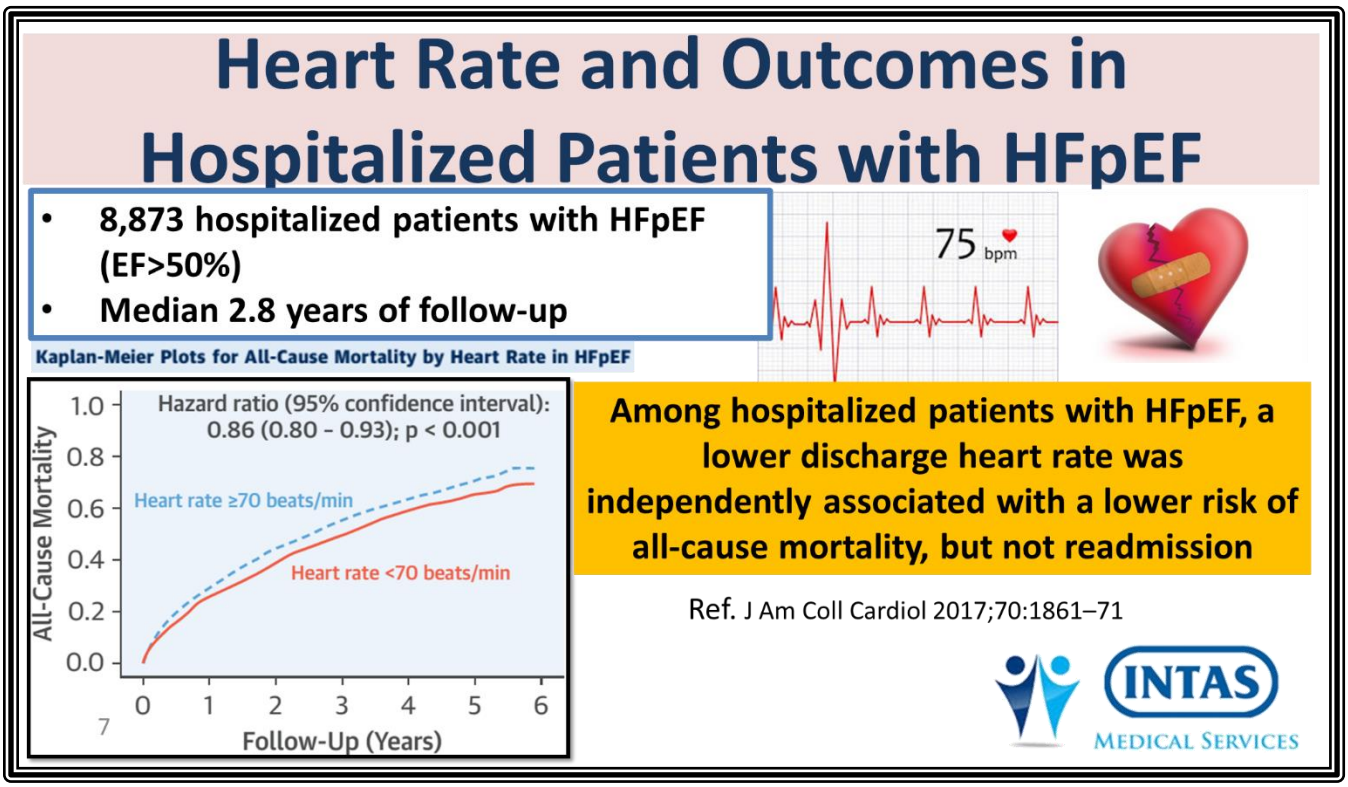
Objective: To ascertain whether persons treated with statins experience a decreased risk of community-acquired *Staphylococcus aureus* bacteremia (CA-SAB) as compared with nonusers.

Patients and Methods: Using population-based medical registries, we conducted a case-control study including all adults with first-time CA-SAB and population controls matched on age, sex, and residence in Northern Denmark from January 1, 2000, through December 31, 2011. Statin users were categorized as current users (new or long-term use), former users, and nonusers. We used conditional logistic regression to compute odds ratios (ORs) for CA-SAB according to statin exposure, overall and stratified by intensity (<20, 20-39, ≥40 mg/d) and duration of use (<365, 365-1094, ≥1095 days).

Results: We identified 2638 patients with first-time CA-SAB and 26,379 matched population controls. Compared with nonusers, current statin users experienced markedly decreased risk of CA-SAB (adjusted OR, 0.73; 95% CI, 0.63-0.84). The adjusted OR was 0.96 (95% CI, 0.60-1.51) for new users, 0.71 (95% CI, 0.62-0.82) for long-term users, and 1.12 (95% CI, 0.94-1.32) for former users as compared with nonusers. The CA-SAB risk decreased with increasing intensity of statin use; thus, compared with nonusers, the adjusted OR was 0.84 (95% CI, 0.68-1.04) for current users with daily dosages of less than 20 mg/d, 0.71 (95% CI, 0.58-0.87) for 20 to 39 mg/d, and 0.63 (95% CI, 0.49-0.81) for 40 mg/d or more. Conversely, we observed no differences in the risk of CA-SAB with successive increases in the duration of statin use.

Conclusion: Statin use was associated with a decreased risk of CA-SAB, particularly in long-term users.

8. High-dose atorvastatin reduces the risk of cardiovascular events in patients with PCI



Summary

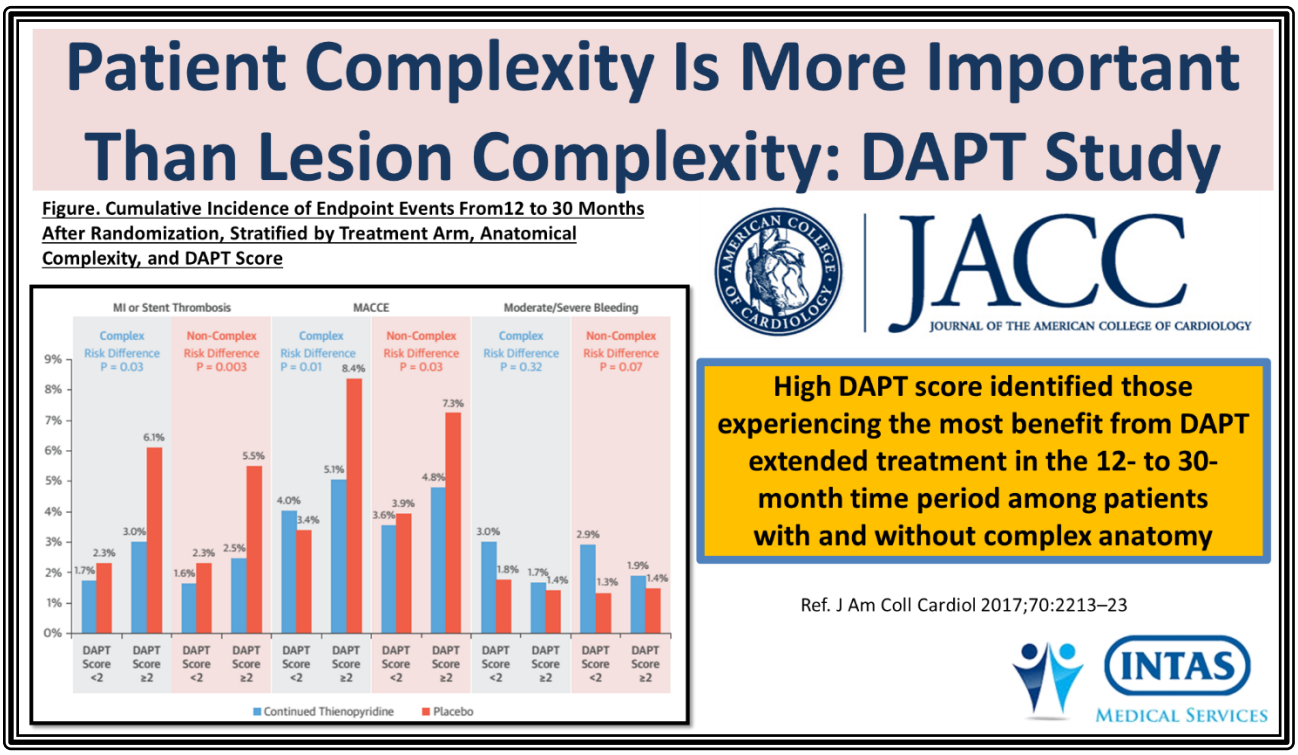
Systematically searched in PubMed, Web of Science, Embase and China National Knowledge Infrastructure from the inception to March 31, 2017, identified relevant trials about efficacy of high-does Atorvastatin for patients with percutaneous coronary intervention. Twelve studies with the number of 2801 patients were included in the meta-analysis.

Compared with control group, high-does Atorvastatin significantly reduced the risk of myocardial infarction in patients with percutaneous coronary intervention (Relative risk =0.62, 95% confidence interval: 0.49-0.78), with low level of heterogeneity (I^2=22.6%, P=0.228). Nine studies with 2248 patients reported the adverse cardiovascular events. A fixed-effect model was applied. Compared with control group, patients with high-does Atorvastatin taken, the risk of adverse cardiovascular events was degraded by 65% (Relative risk, RR=0.65, 95% confidence interval (CI): 0.50-0.84), which was confirmed by trial sequential analysis as the cumulative Z curve entered the futility area.

The subgroup analyses found that decreased risks of myocardial infarction among trails (RR=0.64, 95%CI: 0.50-0.83, RR=0.55, 95%CI: 0.34-0.88). Egger and Begg's test found no publication bias (t=-1.670, *P*=0.129; Z=1.560, *P*=0.119).

The use of high-dose Atorvastatin could reduce the risk of myocardial infraction and cardiovascular adverse events in patients with percutaneous coronary intervention. High-dose Atorvastatin was recommended as an adjunct to aid percutaneous coronary intervention.

9. Patient Complexity Is More Important Than Lesion Complexity: DAPT Study



Background Subjects undergoing coronary stenting with complex lesion anatomy may experience different risks and benefits with prolonged dual antiplatelet therapy.

Objectives The authors assessed the effect of 30 months versus 12 months of dual antiplatelet therapy (DAPT) after percutaneous coronary intervention (PCI) based on the presence or absence of anatomically-complex target lesions.

Methods In the DAPT Study, combined myocardial infarction (MI) or stent thrombosis and moderate/severe bleeding were assessed in enrolled (n = 25,416) and randomized (n = 11,554) subjects. Complex lesions had any of the following characteristics: unprotected left main, >2 lesions/vessel, length ≥30 mm, bifurcation with side branch ≥2.5 mm, vein bypass graft, or thrombus-containing lesion. Events were evaluated according to increasing number of complexity characteristics and compared according to DAPT score.

Results Enrolled subjects with more complex target lesions had higher rates of MI or stent thrombosis in the first 12 months after PCI (3.9% vs. 2.4%; $p < 0.001$). Among those who were event-free at 12 months, rates of MI or stent thrombosis between 12 and 30 months were similar between those with versus without complex anatomy (3.5% vs. 2.9%; $p = 0.07$). Among subjects with anatomic complexity, those with DAPT scores ≥2 randomized to continued thienopyridine had greater reductions in MI or stent thrombosis (3.0% vs. 6.1%; $p < 0.001$) compared with subjects with scores <2 (1.7% vs. 2.3%; $p = 0.42$; p value comparing risk differences = 0.03).

Conclusions Complex target-lesion anatomy is associated with increased ischemic events, particularly within the first year after PCI. Among those without events in the first 12 months, the benefits of extending DAPT were similar in subjects with and without complex lesions. A high DAPT score identified those experiencing the most benefit from extended treatment among patients with and without complex anatomy

10. The Role of Nitroglycerin in Cardiovascular Therapeutics: State of the Art review-JAAC

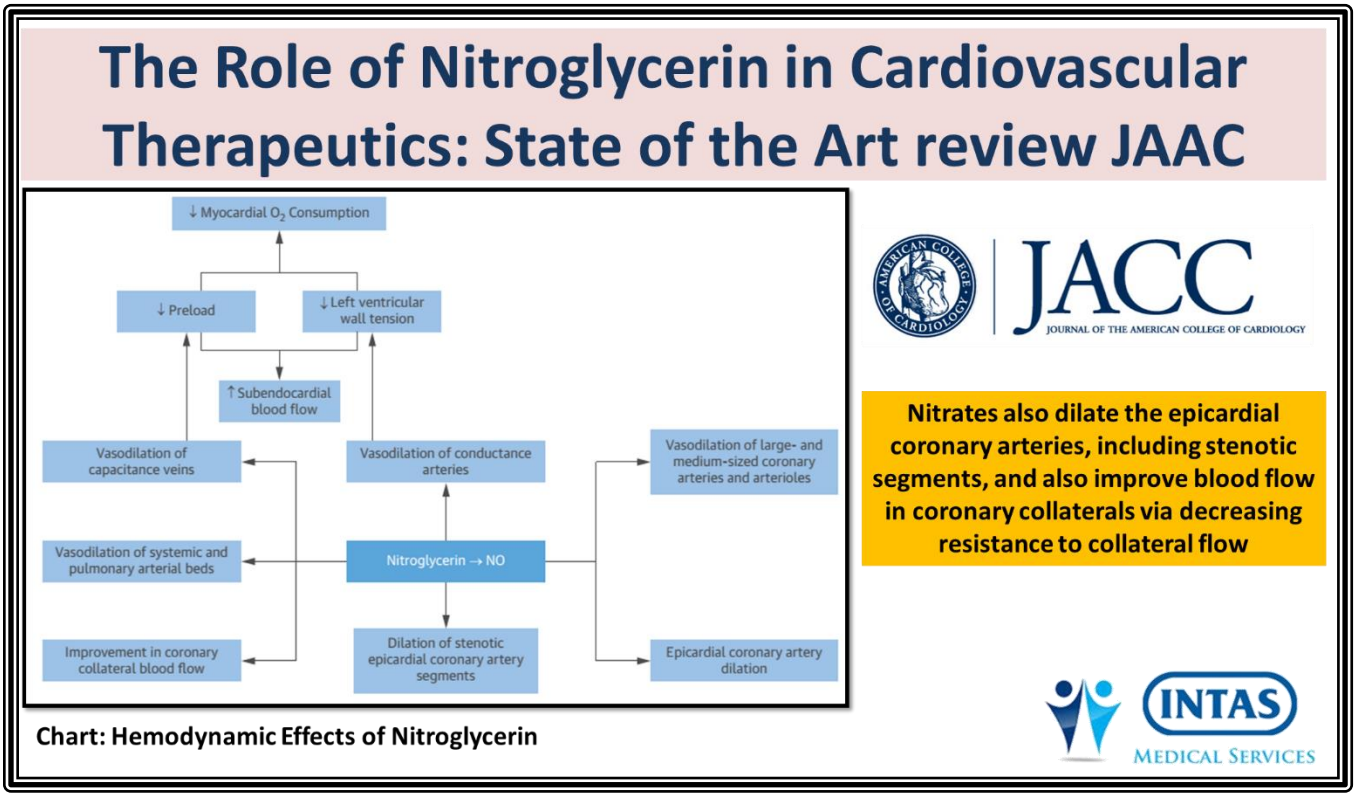


Chart: Hemodynamic Effects of Nitroglycerin

Summary

The use of nitroglycerin in the treatment of angina pectoris began not long after its original synthesis in 1847. Since then, the discovery of nitric oxide as a biological effector and better understanding of its roles in vasodilation, cell permeability, platelet function, inflammation, and other vascular processes have advanced our knowledge of the hemodynamic (mostly mediated through vasodilation of capacitance and conductance arteries) and nonhemodynamic effects of organic nitrate therapy, via both nitric oxide–dependent and –independent mechanisms.

Nitrates are rapidly absorbed from mucous membranes, the gastrointestinal tract, and the skin; thus, nitroglycerin is available in a number of preparations for delivery via several routes: oral tablets, sublingual tablets, buccal tablets, sublingual spray, transdermal ointment, and transdermal patch, as well as intravenous formulations. Organic nitrates are commonly used in the treatment of cardiovascular disease, but clinical data limit their use mostly to the treatment of angina.

Although several agents have been studied for use in the prevention of nitrate tolerance, none are currently recommended owing to a paucity of supportive clinical data. Only 1 method of preventing nitrate tolerance remains widely accepted: the use of a dosing strategy that provides an interval of no or low nitrate exposure during each 24-h period. Nitric oxide's important role in several cardiovascular disease mechanisms continues to drive research toward finding novel ways to affect both endogenous and exogenous sources of this key molecular mediator.

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