カテーテルを用いた大動脈弁手術の開心術に対する非劣性が認められた

PARTNER：新たな心臓弁システムと標準的な手術の1年生存率は同等である

PARTNER: Survival similar at one year for novel heart valve system and standard surgery

高齢ハイリスク患者に対する経カテーテル大動脈弁置換術（TAVR）と従来の開心大動脈弁置換（AVR）術を比較した結果、脳卒中や重大な出血などのエンドポイントには差があったが、1年死亡率は同等であったとのPARTNERトライアルの結果が第60回American College of Cardiology学会で発表された。重度大動脈弁狭窄を有するハイリスク高齢患者計699人を26施設においてTAVRまたはAVRに無作為に割り付けた（TAVR348人；AVR350人）。年齢中央値は84.1歳であった。30日間の総死亡率（3.4%対6.5%）および症状改善率はTAVRの方が良好であったが、これらの確率は1年後には同等になった。重大な脳卒中発現率は、30日間（3.8%対2.1%）および1年間（5.1%対2.4%）ともにTAVRにおいて高かった。30日間の主要な血管系合併症もまたTAVR後においてかなり多く認められた（11.0%対3.2%）が、重大な出血の発現率（9.3%対19.5%）および心房細動による不規則な心調律の新規発症（8.6%対16.0%）はTAVR群においてはるかに低かった。人工弁周囲逆流もまた、TAVR後により多く認められた。

Full Text

Death rates are similar at one year for a catheter-based method of replacing heart valves and conventional surgery in older high-risk patients, though endpoints such as stroke and major bleeding show marked differences, according to research from the PARTNER Trial presented at the American College of Cardiology's 60th Annual Scientific Session.

Standard treatment for severe stenosis is open-heart surgery to replace the aortic valve (AVR), but many older people are medically unfit for the procedure. Without valve replacement, half of these patients die within two years.

This is the first report from a randomized trial of AVR versus a minimally invasive system called transcatheter aortic valve replacement (TAVR) in AVR candidates whose age and overall health posed high risks for conventional surgery. In previously reported findings for patients in this trial who were not candidates for AVR, TAVR was linked to a 20 percent survival benefit at one year.

"Large-scale, randomized comparisons of new interventional procedures to gold-standard surgical procedures have seldom been done," said Craig R. Smith, M.D., chief of the Division of Cardiothoracic Surgery, New York-Presbyterian Hospital/Columbia University Medical Center, and the study's co-principal investigator. "This is the ideal opportunity, because surgical AVR is one of the most effective operations surgeons offer, and TAVR is the most exciting new treatment for aortic stenosis in the past two to three decades."

TAVR's centerpiece is a wire mesh stent encasing three sutured-on valve flaps called leaflets, made from cow tissue and treated to cut down on calcium deposits that cause stenosis. Cardiologists deliver the bioprosthetic valve to its target location with a catheter guided transfemoral (TF) or transapical (TA) access if peripheral arteries are not large enough. Like standard valve replacement, this procedure is performed under general anesthesia.

A total of 699 high-risk older patients with severe aortic stenosis were randomly assigned at 26 centers to TAVR or to AVR. The median age was 84.1 years. The TAVR group totaled 348 patients (244 TF, 104 TA); 350 patients were in the AVR group. Patient characteristics were similar overall across cohorts, but the patients assigned to TA TAVR had a higher risk profile. Endpoints included death from any cause at one year (primary endpoint), stroke and major vascular and bleeding events.

Although 30-day results favored TAVR for all-cause deaths (3.4 percent vs. 6.5 percent) and improvement in symptoms, both rates were similar at one year. Major strokes were higher for TAVR at both 30 days (3.8 percent vs. 2.1 percent) and one year (5.1 percent vs. 2.4 percent). At 30 days major vascular complications also were much more common after TAVR (11.0 percent vs. 3.2 percent), but the TAVR group's rates were much lower for major bleeding (9.3 percent vs. 19.5 percent) and new-onset irregular heart rhythms of atrial fibrillation (8.6 percent vs. 16.0 percent). Para-valvular regurgitation - leaks alongside or near the valve ? occurred more often after TAVR as well.

"These results clearly show that TAVR is an excellent alternative to surgical AVR in high-risk patients," Smith said. "Recommendations to individual patients will need to weigh the appeal of avoiding open-heart surgery, with its known risks, against less invasive TAVR with different and less well understood risks, as well as the absence of long term follow-up. Future trials will help delineate the role of TAVR in intermediate risk patients."

A follow-up PARTNER II Trial was approved in February 2011 to test the next generation of this novel valve and a different catheter delivery system against the valve and delivery method used in the first PARTNER Trial.

The trial is funded by Edwards Lifesciences, Inc. Smith has no financial relationship with the company.

ACC2011特集

Mitraclipは手術と比較し有効性は低いが安全性は高い

EVEREST II：経皮的僧帽弁修復術は患者を選択すれば開心術と比較し優る

EVEREST II: Percutaneous mitral valve repair compares favorably with open-heart surgery especially for select patients

一部の僧帽弁逆流（MR）患者においては経皮的僧帽弁修復術は従来の開心術と比較し優るとのEVEREST IIスタディの最新の研究結果が第60回American College of Cardiology学会で発表され、同時にNew England Journal of Medicineに掲載される。このphase IIスタディには僧帽弁手術のクライテリア（MRグレード3＋または4＋）に合致した患者279人を組み入れた。患者はMitraClip®または標準的な手術群に2対1の比率で割り付けられた。これら2つの治療法の有効性は、死亡の回避、僧帽弁手術をさらに行わないこと、MRグレードが術前の最小の3＋より低いことの合計で評価された。治療の比較において、経皮的手術群の101人（62.7%）が合計のエンドポイントに合致したのに対し、開心術群においては66人（66.3%）であった。2年後には、MitraClip®使用患者の78%が手術を必要としなかった。30日間の主要な有害事象は経皮的手術群において有意に低かった（15.0%対47.9%）。2単位以上の輸血がこの差に最も影響を与えた：経皮的手術群では13.3%であったのに対し開心術群では44.7%であった。

Full Text

The MitraClip® - a tiny device threaded through an artery to repair leaky heart valves - continues to compare favorably with conventional open-heart surgery for treatment of select patients with mitral regurgitation, according to updated research findings from the EVEREST II study presented at the American College of Cardiology's 60th Annual Scientific Session.

Each year 250,000 people in the United States learn they have Mitral regurgitation (MR), but only 20 percent eventually undergo standard treatment to repair or replace the valve, which is open-heart surgery that puts patients on a heart-lung bypass machine. For many, that procedure poses too great a risk. Instead they rely on medications to reduce MR symptoms, and limit their activities as physical function declines. Symptoms of MR can include palpitations, shortness of breath, fatigue, lightheadedness, cough and swelling in the legs and feet from fluid buildup.

The percutaneous MitraClip® involves a minimally invasive procedure that may make valve repair feasible for more people with MR. Cardiologists trained to use this system guide a catheter-mounted device through an incision in the groin, into the femoral artery and on to the heart. When the device is properly placed, it clamps the edges of the faulty valve together like a clothespin (sometimes a second clip is inserted for better control of MR). Standard MR surgery and MitraClip insertion both take about two hours, but their hospitalization and recovery times differ greatly.

"After getting a MitraClip®, patients spend one or two nights in the hospital versus five to seven days after open-heart surgery, and they're back to full activity immediately," said Ted Feldman, M.D., director of the cardiac catheterization laboratory at NorthShore University HealthSystem, Evanston, Ill., and the study's co-principal investigator. "Traditional open-heart surgery has a recovery time of one to three months. The contrast is pretty striking."

This Phase II study enrolled 279 patients in 37 North American centers who met criteria for mitral valve surgery: grade 3+ (moderate to severe) or 4+ (severe) MR. All patients had valve anatomy suitable for the procedure and were randomly assigned in a 2-to-1 ratio to the MitraClip® or to standard surgery. Both groups were well matched for baseline patient characteristics. Year 1 data have been published. This presentation reports Year 2 data, and patients will be followed for five years.

The effectiveness of the two treatments was measured by a composite of freedom from death, no new mitral valve surgery and MR lower than pretreatment minimum of 3+. In the treatment comparison, 101 patients (62.7 percent) in the percutaneous group met the composite endpoint vs. 66 (66.3 percent) in the surgery group. At two years, 78 percent of patients with the MitraClip® did not need surgery.

Major adverse events at 30 days were significantly lower in the percutaneous group (15.0 percent vs. 47.9 percent). Blood transfusions of two units or more account for most of this difference: 13.3 percent in the percutaneous group vs. 44.7 percent for surgery patients.

Durability and anti-clotting drugs are other issues considered in this research. A mechanical heart valve lasts 35 years and requires the patient to take warfarin for life. Valve repair with a MitraClip® should last approximately 15 years, and after implant, patients take clopidogrel for just one month and aspirin for six months. Although the procedure's surgical version has demonstrated durability for more than 12 years, long-term outcomes from MitraClip can be defined only after further study.

"Both procedures reduced mitral regurgitation and produced meaningful clinical benefits, with the MitraClip® valve repair increasing safety and surgery decreasing mitral regurgitation more completely," Feldman said. "Our two-year data indicate that the percutaneous procedure is a therapeutic option for certain patients with significant mitral regurgitation."

The EVEREST II study (Endovascular Valve Edge-to-Edge REpair STudy) is funded by Evalve, Inc., which also provides research funding to NorthShore University HealthSystem. Feldman is a consultant to Abbott, which acquired Evalve in 2009.

These findings were published concurrently in the New England Journal of Medicine.

ACC2011特集

薬剤溶出ステントは予後を改善する

エストロゲンレベルは肺がん患者の予後に影響することが示された

ISAR-CABG:Drug-eluting stents lead to improved outcomes in saphenous vein graft lesions

伏在静脈グラフト病変に植え込んだ薬剤溶出ステント（DES）とベアメタルステント（BMS）を比較した最大規模の無作為多施設トライアルの結果、死亡、心筋梗塞、および血行再建術再施行の合計の発現率がDESにおいて低いことが示されたと第60回American College of Cardiology学会で発表された。研究者らは過去に冠動脈バイパス（CABG）手術を施行された患者610人を組み入れた。対象患者は全員がその後に伏在静脈グラフトに1つ以上の病変を発現し、スタディにおいて血管形成術施行時にDES（303人）またはBMS（307人）のいずれかを植え込まれる群に無作為に割り付けられた。1年後の主要な心有害事象はBMS群と比較しDES群において35%少なかった。つまり、一次エンドポイントを発現したのは DES群において16.5%であったのに対しBMS群においては22.1%であった（p=0.028）。DES群におけるイベント発現率低下は、主に標的病変に対する再血行再建術施行率がDES群において7.2%であったのに対しBMS群で 12.9%と、DES群において有意に低かった（p=0.020）ためであった。

Full Text

In the largest randomized, multicenter trial to compare drug-eluting stents (DES) and bare-metal stents (BMS) placed in saphenous vein graft lesions, researchers found that DES led to a lower combined rate of death, heart attack, and repeat revascularization, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

While saphenous vein grafts (SVGs) have been used extensively in coronary artery bypass graft (CABG) surgery, these conduits develop atherosclerotic disease that results in vessel narrowing or closure in a high percentage of patients. Conducting a second CABG surgery to fix the graft is a possibility but can result in higher mortality and morbidity rates than the first operation. Performing angioplasty with a stent is an alternative to repeat CABG surgery; research is still being conducted to optimize this procedure.

"DES have proven superior to BMS in all coronary artery lesion subsets examined, but their performance has been insufficiently evaluated in SVG lesions," said Julinda Mehilli, M.D., director of clinical research and data coordinating in the Intracoronary Stenting and Antithrombosis Research (ISAR) Center at the German Heart Center Munich, Germany. "The only two very small randomized trials comparing DES with BMS in SVG lesions provided conflicting results. Thus, the aim of the ISAR-CABG trial was to investigate this question in a larger population sufficiently powered to provide information on clinical endpoints."

For the study, German researchers enrolled 610 patients who had previously undergone CABG surgery. All study patients had subsequently developed at least one lesion in their saphenous vein graft and were randomized to receive either a DES (n = 303) or a BMS (n = 307) in the study angioplasty procedure.

The study's primary endpoint was a composite of major adverse cardiac events [death, heart attack, and target-lesion revascularization (TLR)] at the one-year follow-up point. The secondary endpoints were the individual rates of death, myocardial infarction, ARC- definite stent thrombosis (ARC - Academic Research Consortium), and the need for TLR over one year.

The researchers found that the incidence of major adverse cardiac events was reduced by 35 percent in the DES cohort compared to the BMS group. Specifically, 16.5 percent of patients in the DES group experienced the primary endpoint compared with 22.1 percent of patients in the BMS group (hazard ratio [HR] 0.65; 95 percent confidence interval [CI] 0.45 ? 0.96; p = 0.028). The reduction in the DES group was primarily due to a significantly lower rate of TLR, which occurred in 7.2 percent of patients in the DES group and in 12.9 percent of patients in the BMS group (hazard ratio [HR] 0.52; 95 percent confidence interval [CI] 0.30 - 0.90; p = 0.020).

The research team found no significant differences in the individual rates of death or heart attack. Additionally, only one patient in the DES cohort experienced ARC-definite stent thrombosis. None of the patients in the BMS group experienced this outcome.

"Saphenous vein graft lesions remain a challenging disease subset for angioplasty. The ISAR-CABG trial, however, demonstrates that DES can safely be used to reduce adverse events in this high-risk subset of patients," Mehilli said.

The study was funded by the German Heart Center Munich and by Cordis. Mehilli had no disclosures to report.

ACC2011特集

スタディの結果、心不全患者において薬物療法よりもCABGの方が成績は良好であった

STITCH：心不全患者の一次解析では薬物療法を凌ぐ手術の有益性は認められなかったが、さらに綿密に調査するとより多くの事実が示唆された

STITCH: No advantage to surgery compared to medical therapy in primary analysis for heart failure patients, but a closer look suggests more

総死亡率に関していえば、動脈硬化性心不全患者においては薬物療法単独とそれにバイパス手術を加えた場合の結果は同等であることが第60回American College of Cardiology学会で発表された。しかし、このSurgical Treatment of Ischemic Heart Failure（STICH）トライアルの結果、冠動脈バイパス術により死亡または入院を合計したリスクに加え、死亡、特に心疾患による死亡が有意に減少することが示された。研究者らは冠動脈疾患による心不全または陳旧性心筋梗塞を有する患者を組み入れ、602人は理想的な薬物療法のみの群へ、610人は CABGと理想的な薬物療法を組み合わせた群に無作為に割り付けた。平均5年近くの経過観察の後に、薬物療法単独と比較しバイパス術により総死亡率が 14%低下した。しかし、この結果は統計学的に有意ではなかった。バイパス術により心血管疾患死（19%）、およびが死亡と全ての入院（26%）も減少し、両方とも統計学的に有意であった（それぞれp=0.05およびp<0.001）。

Full Text

When it comes to overall survival, patients with heart failure caused by atherosclerosis may do just as well with medication alone as when bypass surgery is added to the treatment plan, according to research presented at the American College of Cardiology's 60th Annual Scientific Session. Coronary artery bypass grafting (CABG) does, however, significantly reduce the risk of death specifically from heart disease, as well as the combined risk of death or hospitalization, the Surgical Treatment of Ischemic Heart Failure (STICH) trial found.

"We were unable to show a significant benefit for CABG in our primary analysis, but if you dive deeper, the data are much more supportive of bypass surgery," said Eric J. Velazquez, M.D., an associate professor of medicine and director of both the cardiac diagnostic unit and echocardiography laboratories at Duke University Medical Center in Durham, NC. "This information fills an important gap in how we should evaluate the opportunity for CABG in these patients."

STICH is the largest randomized, controlled study ever to compare CABG plus the best possible medical therapy to aggressive medical therapy alone in patients with coronary artery disease and heart failure.

In about two-thirds of patients with heart failure, the underlying cause is clogged coronary arteries, which deprive the heart muscle of enough blood and oxygen and impair its ability to pump fluids to the rest of the body. In bypass surgery, healthy arteries and veins are used to re-route blood around the blockages, in hopes of restoring heart function. Until now it has been unclear whether the risks of bypass surgery were worth taking, given recent life-saving advances in medical therapy.

For the study, researchers at 99 medical centers in 22 countries recruited patients with heart failure caused by coronary artery disease or a previous heart attack, randomly assigning 602 to ideal medical therapy alone and 610 to CABG plus ideal medical therapy. After an average of nearly five years of follow-up, they found that bypass surgery reduced the risk of death from any cause by 14 percent when compared to medical therapy. However, the finding was not statistically significant.

Bypass surgery also reduced the risk of cardiovascular death by 19 percent and the combined risk of death from any cause plus hospitalization for heart disease by 26 percent. Both findings were statistically significant (p=0.05 and p<0.001, respectively).

Fifty-five patients who were assigned to the surgery group never actually had the procedure, whereas 100 who were assigned to medical therapy eventually had CABG. When researchers analyzed the data only on patients who had their assigned treatment, they found that bypass surgery reduced the risk of death from any cause by 25 percent (p=0.005). Similarly, when they analyzed the data according to the treatment patients actually had, including the "crossovers" into the opposite group, they found that bypass surgery reduced the risk of death from any cause by 30 to 50 percent.

Researchers did note that bypass surgery had a higher upfront risk than medical treatment alone. In fact, it was only after two years that survival was better with bypass surgery.

"Although the totality of information supports CABG, there is an early hazard," Velazquez said. "The fairest approach is to evaluate each patient's prognosis. If they have a low likelihood of living two years or don't want to take the risk of having surgery, medical therapy may be the better option."

A separate STICH substudy evaluated whether imaging could be used to identify which patients are likely to benefit from bypass surgery. Researchers recruited a total of 601 patients to have one of two types of imaging tests: a nuclear perfusion scan or dobutamine echocardiography. These tests use different methods to evaluate poorly functioning heart tissue and determine if it is still alive. Viable tissue, as it is called, can often recover function once it has an adequate blood supply, while irreversibly damaged tissue cannot.

After nearly five years of follow-up, researchers found no relationship between the results of viability imaging and the effectiveness of bypass surgery. Imaging did provide valuable information on the likelihood of long-term survival, however. Overall, patients with living heart tissue were 40 percent less likely to die during follow-up when compared to patients with irreversible heart damage.

"Assessing myocardial viability is useful in identifying the risk of patients and getting information about prognosis," said Robert O. Bonow, M.D., a professor of medicine and director of the Center for Cardiovascular Innovation at Northwestern University Feinberg School of Medicine in Chicago. "But when weighing results of viability testing versus other characteristics, it's not helpful in identifying which patients will benefit from surgery."

The STICH trial and STICH Viability substudy were funded by the National Heart, Lung, and Blood Institute. Velazquez and Bonow have no potential conflicts of interest to report.

ACC2011特集

橈骨動脈からのアクセスにより血管系合併症が減少する

RIVAL：橈骨動脈からアクセスして冠動脈インターベンションを行うことにより成功率は維持される一方血管系合併症は減少する

RIVAL: Radial access for coronary interventions reduces vascular complications while maintaining angioplasty success rates

冠動脈造影および冠動脈インターベンションの際の橈骨動脈穿刺と大腿動脈穿刺を比較した最大規模のスタディにおいて、橈骨動脈からのアクセスにより血管系合併症が減少する一方成功率は維持されることが示されたとの研究結果が第60回American College of Cardiology学会で発表され、Lancetに掲載された。このRIVALスタディにおいて、7,021人の患者が橈骨動脈（3,507人）または大腿動脈（3,514人）からのアクセスにより施術を受ける群に無作為に割り付けられた。一次エンドポイント（30日間の死亡、心筋梗塞（MI）、脳卒中、またはCABG以外による重大な出血）発現に関してはそれぞれ3.7%と4.0%（p=0.50）で、両アプローチにおいて同様の結果であった。血管形成術成功率も両群間で同等であった(p=0.83)。しかし、主要な血管系合併症に関して調査すると、橈骨動脈群において1.4%であったのと比較し大腿動脈群においては3.7%であり、橈骨動脈群の方が成績は良好であった。ST上昇MI患者においても、一次エンドポイントおよび死亡率に関して橈骨動脈の方が結果は良好であった。橈骨動脈穿刺の施術数の多い施設において、大腿動脈穿刺よりも橈骨動脈穿刺の成績が良好であった。穿刺部位の重大な出血は全て大腿動脈穿刺部位において発生した。

Full Text

In the largest randomized trial to compare radial access and femoral access for coronary angiography and intervention, researchers found that radial access led to reduced rates of vascular complications while maintaining similar angioplasty success rates, according to research presented at the American College of Cardiology's 60th Annual Scientific Session (ACC.11).

The trial also found that radial access did not reduce the primary outcome measure of death, myocardial infarction, stroke, and non-CABG-related major bleeding compared to femoral access in the overall study population. However, radial access did lead to reductions in the primary outcome measure in patients who underwent the procedure at hospitals that conducted a high volume of radial procedures.

The RIVAL trial was designed to help determine the optimal access site for coronary angiography and intervention in patients with acute coronary syndromes. While prior data have shown that radial access results in fewer bleeding complications than femoral access, this information has only come from observational studies and small randomized trials. In addition, there has been concern that radial access could be associated with a greater angioplasty procedural failure rate.

Across the past two decades, femoral access has been used in approximately 95 percent of coronary angiography and interventional procedures in the United States. However, the data from the previous observational studies suggest that the radial artery is associated with a 50 percent to 60 percent reduction in the odds of major bleeding, which is strongly associated with a reduction in mortality.

Thus, the study researchers believed this alternate route may be an attractive option for interventional cardiologists.

"It is increasingly recognized that preventing bleeding complications may be just as important as preventing recurrent ischemic complications in patients with acute coronary syndromes," said Sanjit Jolly, M.D., M.Sc., assistant professor of medicine at McMaster University in Hamilton, Ontario, Canada. "Our hypothesis was that radial access would reduce access site bleeding with preserved angioplasty efficacy."

This international, multicenter study randomized 7,021 patients to receive either radial access (n = 3507) or femoral access (n = 3514).

The primary outcome measure was the incidence of death, heart attack, stroke, or non-CABG-related major bleeding at 30 days. Other outcome measures included angioplasty procedural success and major vascular access site complications at 48 hours and 30 days post-procedure.

The research team found that radial access and femoral access performed similarly with regard to the primary outcome measure, with 3.7 percent and 4.0 percent of patients, respectively, experiencing death, heart attack, stroke, or non-CABG-related major bleeding at 30 days (hazard ratio [HR] 0.92; 95 percent confidence interval [CI] 0.72 - 1.17; p = 0.50). Both groups also showed similar rates of angioplasty success, at 95.4 percent of patients in the radial group and 95.2 percent of patients in the femoral cohort (HR 1.01; 95 percent CI 0.95 - 1.07; p = 0.83).

Radial access performed better, however, when the team examined major vascular complications. Specifically, 1.4 percent of patients in the radial cohort developed this outcome, compared to 3.7 percent of patients in the femoral group (HR 0.37; 95 percent CI 0.27 - 0.52; p <0.001). Radial access also yielded better results in patients with ST-segment elevation heart attack for the primary outcome measure and for mortality. Furthermore, radial access had better outcomes than femoral access at institutions that performed a high volume of radial procedures (the converse was not seen at institutions performing many femoral access procedures). In addition, all access site major bleeds occurred at the femoral arterial access site.

"The results of the RIVAL trial show that both access sites are safe and effective," Jolly said. "The reduction in vascular access complications may be a reason for interventional cardiologists to use radial access. Furthermore, the effectiveness of the radial approach may improve with greater expertise and procedural volume."

The study was funded by Sanofi-Aventis, the Population Health Research Institute, and the Canadian Network and Center for Trials Internationally (funded through the Canadian Institutes of Health Research). Jolly disclosed that he received institutional research grants from Sanofi-Aventis, Bristol- Myers Squibb, and Medtronic. He also received consulting fees from Sanofi-Aventis, GlaxoSmithKline, and AstraZeneca.

The study was simultaneously published in The Lancet at the time of presentation.

ACC2011特集

バイパスグラフトには橈骨動脈の方が成績は良好である

RAPS：冠動脈バイパス術患者においては伏在静脈グラフトよりも橈骨動脈を用いた方が成績は良好である

RAPS: Radial artery outperforms saphenous vein graft in coronary artery bypass graft patients

冠動脈バイパス（CABG）術に用いるのに最良の血管を調査した無作為化多施設スタディの初めての5年間のデータを公表したカナダの研究チームが、橈骨動脈が伏在静脈よりも機能的グラフト閉塞または完全グラフト閉塞率が低いことを示したと第60回American College of Cardiology学会で発表した。RAPSトライアルにおいては3枝病変に対しCABG手術を施行された患者561人を組み入れた。各々の患者において橈骨動脈グラフトおよび伏在静脈グラフトが2つの異なる病変に対し用いられた。研究者らは1年後に生存していた患者440人に対し冠動脈造影を施行し、269人においては術後平均7.6年に再度冠動脈造影を施行した。後期のフォローアップの結果、不完全閉塞率は、橈骨動脈グラフトおよび伏在静脈グラフトにおいてそれぞれ12.0%と18.8%であり（p=0.05）、橈骨動脈グラフトの方が有意に少なかった。完全閉塞もまた橈骨動脈グラフト（8.9%）において伏在静脈グラフト（17.8%）よりも有意に少なかった（p=0.004）。橈骨動脈において閉塞率が低かったことに加え、橈骨動脈グラフトがよりびまん性病変の血管においてより有用であることも示された。

Full Text

Providing the first five-year data from a randomized, multicenter study examining the best conduit for coronary artery bypass graft (CABG) surgery, a Canadian research team found that the radial artery outperformed the saphenous vein, with the former leading to reduced rates of functional graft occlusion or complete graft occlusion according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

The study was conducted at 13 centers across Canada and enrolled 561 patients who underwent CABG surgery for three-vessel disease. Each patient received both a radial artery graft and a saphenous vein graft at two different diseased vessel sites. The primary endpoint of functional graft occlusion was determined through invasive angiography at least five years after surgery. The secondary endpoint was complete graft occlusion determined through invasive angiography or computed tomography angiography.

The research team conducted late angiography on 440 patients alive at one year and on 269 patients at a mean of 7.6 years post-procedure. In the latter follow up, the researchers found that significantly fewer radial arteries became partially occluded than saphenous vein grafts, at 12.0 percent and 18.8 percent, respectively (p = 0.05, odds ratio [OR] 0.64, 95 percent confidence interval [CI] 0.41 - 0.98). Significantly fewer radial arteries also became completely occluded, at 8.9 percent, than saphenous veins, at 17.8 percent (p = 0.004, OR 0.50, 95 percent CI 0.32- 0.80).

In the researchers' previously published one-year results, complete graft occlusion was significantly reduced in the radial artery compared to the saphenous vein, while partial graft occlusion was similar between the two conduits.

"Our study shows that the radial artery does seem to offer an improvement in graft patency compared to vein grafts," said Stephen Fremes, M.D., MSc, lead study author and head of the Division of Cardiac and Vascular Surgery, Schulich Heart Centre, at Sunnybrook Health Sciences Centre in Toronto.

Cardiac specialists have long debated which conduit provides better long-term graft outcomes. Many believe that the radial artery is superior to the saphenous vein because arterial grafts develop fewer diseases and better withstand aortic pressure. However, most of the studies proving this have been done using the left internal thoracic artery, not the radial artery.

"The left internal thoracic artery was shown in the 1980s to be superior to a vein graft, and as a result, there was a wave of enthusiasm to use this artery - as well as other arteries - for either more complete arterial revascularization or total arterial revascularization," Fremes said. "The radial artery possesses some advantages relative to the internal thoracic artery; it has thicker walls, which makes suturing easier, and a greater length that can reach all targets on the heart."

In addition to finding lower rates of occlusion in the radial artery grafts, the research team also found that radial artery grafts worked better when grafted to more thoroughly diseased vessels. Specifically, the researchers separated the target vessels into three groups: those with 70-89 percent narrowing, 90-99 percent narrowing, and 100 percent narrowing. They found a much lower failure rate (approximately 50 percent) for radial artery grafts that were grafted to vessels with 90 percent narrowing or more.

"The implications from our one-year study were confirmed in the five-year results - radial artery bypass grafts should be used preferentially for the most severely narrowed coronary arteries," Fremes said.

Fremes noted that because each study patient received both graft types, the researchers were unable to associate clinical outcomes with a specific grafting strategy. He added that late findings from an Australian study and a study conducted by the Veterans Affairs Cooperative Studies program will provide both angiographic and clinical outcomes.

The study was funded by the Canadian Institutes of Health Research. Fremes had no financial disclosures related to the study.

ACC2011特集

エコーによりペースメーカーリードの最良の設置部位が得られる

TARGET：個々の患者について評価することにより心臓再同期療法の結果が向上する

TARGET: Individualized assessment improves results of cardiac resynchronization therapy

ペースメーカーリードの設置部位決定を心エコーガイド下で行うことの有益性を報告した初めての無作為化臨床試験の結果、左室機能を解析しリードワイヤの設置位置をガイドするソフトウェアを用いた患者ごとのアプローチ法により臨床上の有益性が上昇することが示されたと第60回American College of Cardiology学会で発表された。研究者らはスペックルトラッキング法（STE）を用いて、心臓再同期療法を予定されている患者220人の心臓評価を行った。試験群に無作為に割り付けられた患者110人においてはリードワイヤの左室内埋め込みをSTE計測ガイド下で行った。コントロール群のリードは STEデータを参照せずに従来通りの方法で行った。左室のリバースリモデリング率（70%対55%）、心不全に関する標準的な尺度の改善（83%対65%）などの臨床上のエンドポイントにおいて試験群の方がコントロール群よりも結果が良好であった。リードが適切であった（リードがちょうど標的部位に設置された）患者は総死亡および心不全による入院の合計の発現率が最も低く（8%）、全体的な結果において良好であった。リード位置が最良位置近傍であった患者においてはその確率は倍（16%）であり、最良部位から離れていた患者においては4.5倍高かった（36%）。

Full Text

In the first randomized clinical trial to report the benefits of using echocardiography - the most common non-invasive tool for diagnostic imaging of the heart - to guide placement of pacemaker leads, researchers found that a patient-tailored approach using software to analyze left ventricle function and guide placement of lead wires can significantly boost clinical benefits from pacemakers, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

"Optimal placement of pacemaker leads is determined by the location of cardiac scar tissue and areas of delayed heart muscle contraction, which vary considerably among patients," said Fakhar Z. Khan, M.D., clinical research fellow, Cambridge University, Cambridge, U.K. "Our improved results with an individualized approach should change the way pacemaker leads are implanted in this population of patients."

Researchers used speckle tracking echocardiography (STE) to conduct cardiac assessments of 220 patients scheduled for cardiac resynchronization therapy. STE is a technological advance that refines echocardiography. Several studies have confirmed that STE is a simple, inexpensive, quick and accurate way to measure strain and function in the myocardium.

For the 110 patients randomly assigned to the test group, STE measurements guided placement of the lead wire implanted in the left ventricle. Leads for the control group were implanted conventionally, without reference to the STE data. The test group had better results than the control group on all clinical endpoints, including rates of response by reverse remodeling of the left ventricle, a measure of improvement in heart function (70 percent vs. 55 percent), and improvement on a standard scale for heart failure (83 percent vs. 65 percent).

Clinical results correlate with degree of success in directing the lead to the optimal site identified by STE. Across both groups, patients with a concordant lead - placed exactly at the target site - had the lowest combined rate of death from any cause and hospitalization related to heart failure (8 percent) and better results overall. That rate was doubled (16 percent) for patients with a lead adjacent to the optimal site and 4.5 times higher (36 percent) for those with a lead remote from the optimal site. A much higher proportion of patients in the test group had concordant lead placement (61 percent vs. 47 percent).

"STE software can be applied to any existing echocardiographic image at no additional risk to the patient," Khan said. "It makes targeting of the lead feasible at any facility that's already performing echocardiography and has the software in their system to analyze the images. That makes it widely accessible, even for small centers and non-university hospitals, where more and more pacemakers are being implanted."

Study participants were recruited from Papworth and Addenbrooke's Hospitals, Cambridge, U.K, and will continue to have ongoing follow-up. The study was sponsored by Papworth Hospital Foundation Trust and funded through charitable funds and the UK National Institute for Health Research.

ACC2011特集

2剤併用抗血小板薬療法は6ヵ月で十分である

EXCELLENT：薬剤溶出ステントを使用した場合の抗血小板薬使用期間はガイドラインの勧告よりも短縮できる可能性がある

EXCELLENT: When drug-eluting stents are used, length of antiplatelet treatment could be shorter than guidelines suggest

EXCELLENTスタディから得られた新たなデータの結果、抗血小板薬を内服している薬剤溶出ステント使用患者に対する抗血小板療法の期間は、6ヵ月とガイドラインが推奨する12ヵ月とでステント血栓リスクは同等であるとの無作為化コントロールトライアルから得られたはじめてのエビデンスが示されたと第60回American College of Cardiology学会で発表された。この19施設のトライアルにおいて1,443人の患者が、エベロリムスまたはシロリムス溶出ステント植え込みとともに2剤併用抗血小板療法6ヵ月または12ヵ月を行う群に無作為に割り付けられた。標的血管不全（心臓死、心筋梗塞または標的血管再血行再建術施行）は6ヵ月群において716人中34人（4.7%）に認められたのに対し、12ヵ月群においては712人中31人（4.4%）であった。この一次エンドポイントに関して6ヵ月群の12ヵ月群に対する、予め規定された40%の非劣性マージンを伴う非劣性が認められた（p=0.0031）。安全性のエンドポイントー死亡、心筋梗塞、脳血管事故、ステント血栓および重大な出血の合計（TIMI）ーに関しては6ヵ月群では24人（3.4%）であり12ヵ月群では22人（3.1%）であった。これら2群における主要な脳ー心血管イベントはそれぞれ54人（7.5%）および60人（8.4%）であった。

Full Text

Patients with drug-eluting stents take antiplatelet drugs to reduce the risk of late stent thrombosis, but questions exist about how long the therapy should last. New data from the EXCELLENT study provide the first evidence from a randomized controlled trial that show six-month antiplatelet therapy is equivalent to the 12-month regimen prescribed by current guidelines, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

Although drug-eluting stents (DES) outperform bare metal stents, data suggest they have a slightly higher risk of late stent thrombosis, a common cause of myocardial infarction and sudden death. The most important risk factor for late thrombosis has been stopping dual antiplatelet therapy (DAPT) too soon, but alternatively, long durations of DAPT can increase the risk of bleeding.

"The recommended duration of DAPT was three to six months in the early introduction period of drug-eluting stents," said Hyeon-Cheol Gwon, M.D., Ph.D., Department of Cardiology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, South Korea. "Current American College of Cardiology/American Heart Association guidelines recommend 12 months or longer without solid scientific evidence."

In this 19-center trial, 1,443 patients were randomly assigned to six or 12 months of DAPT with a stent that released either everolimus or sirolimus; 12-month data are available for 1,428 patients and results of the stent trial have been presented. This is the first presentation of findings for a comparison of six-month and 12-month DAPT with the standard combination of aspirin and clopidogrel. Patients will be followed for at least two more years.

Results for target vessel failure - defined as cardiac death, myocardial infarction and target vessel revascularization - were 34 of 716 patients (4.7 percent) in the six-month group and 31 of 712 patients (4.4 percent) in the 12-month group. For this primary endpoint, the six-month group was non-inferior to the 12-month group, with a pre-specified non-inferiority margin of 40 percent (p=0.0031). For the safety endpoint - a composite of death, myocardial infarction, cerebrovascular accident, stent thrombosis and a type of major bleeding (TIMI) - results were 24 (3.4 percent) in the six-month group and 22 (3.1 percent) in the 12-month group. Major adverse cerebro-cardiovascular events for these groups were 54 (7.5 percent) and 60 (8.4 percent), respectively. The subgroup analysis by stent type showed very even numbers by outcome for the everolimus stent at six and 12 months, but the study was underpowered to compare the two regimens reliably for death, myocardial infarction and stent thrombosis.

"Our results may be very reassuring for many physicians who may need to discontinue clopidogrel before the routinely recommended 12-month duration for various reasons," Gwon said. "However, we need to remember that this study was underpowered to test the non-inferiority of the shorter duration for hard endpoints. A larger-scale randomized controlled trial is needed."

The study was funded by the Ministry of Health, Welfare, and Family Affairs of Korea, Abbott Vascular Korea and Boston Scientific Korea. Gwon has no financial relationship with either company.

ACC2011特集

Rivaroxabanはエノキサパリンと比較し正味の臨床上の有益性は認められない

MAGELLAN：Rivaroxabanは急性疾患で入院した患者における静脈血栓塞栓予防の点でエノキサパリンに優る

MAGELLAN: Rivaroxaban compares favorably with enoxaparin in preventing venous thromboembolism in acutely ill hospitalized patients

Rivaroxabanに関して既に蓄積された臨床試験のデータに大量の臨床試験データを加えた MAGELLANトライアルにより、急性疾患で入院した患者における静脈血栓塞栓予防において、短期使用（10日間）についてはエノキサパリンに対する非劣性が、長期使用に関してはエノキサパリン使用後のプラセボ投与に対する優越性が示された。第60回American College of Cardiology学会で発表されたこの研究結果によると出血率はスタディを通して低かったが、rivaroxaban群においては高かった。52ヵ国の患者8,101人のうち4,050人をrivaroxabanで35日間治療する群に、4,051人をエノキサパリンで10日間治療する群に無作為に割り付けた（両群ともにプラセボの経口投与または皮下注投与が行われた）。一次有効性項目に関しては10日後までは両薬剤ともに同等の結果であり、このエンドポイントに合致したのは両群ともに2.7%であった（非劣性に関してp=0.0025）。35日間の有効性に関してはrivaroxabanの方がエノキサパリン後のプラセボ投与よりも有意に良好な結果であり、4.4%の患者が一次有効性エンドポイントに達したのに対しエノキサパリン群では5.7%であった（優越性に関してp=0.0211）。しかし、10日間および35日間ともにエノキサパリンの方がrivaroxabanよりも出血率は有意に低かった（両者ともp<0.0001）。

Full Text

Adding to the extensive clinical trial data already amassed for rivaroxaban, an international research team found that the MAGELLAN trial showed non-inferiority to enoxaparin in short-term use (10 days) and superiority to enoxaparin followed by placebo in long-term use (35 days), in the prevention of venous thromboembolism (VTE) in acutely ill hospitalized patients. Bleeding rates were generally low across the study but were higher in the rivaroxaban arm, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

The MAGELLAN study is a phase III clinical trial that compared the oral anticoagulant rivaroxaban with subcutaneous enoxaparin in patients admitted to the hospital for an acute medical condition (including acute heart failure, acute infectious disease, and acute respiratory insufficiency). The study was designed to determine which treatment would better prevent VTE - which comprises deep vein thrombosis (DVT) and pulmonary embolism (PE). It evaluated how the standard regimen of enoxaparin (10 days) performed in comparison to short-term (10 days) rivaroxaban. It also evaluated an extended treatment regimen of rivaroxaban (35 days) compared to enoxaparin (10 days) followed by placebo, as the optimal duration of VTE prophylaxis is unknown in this setting.

"Every year, venous blood clots kill more than 1 million people, including approximately 300,000 in the U.S. and more than 500,000 in Europe," said lead study author Alexander T. Cohen, honorary consultant vascular physician in the Department of Surgery and Vascular Medicine at King's College Hospital, London. "VTE is often associated with recent surgery or trauma, but 50 percent to 70 percent of symptomatic thromboembolic events and 70 percent to 80 percent of fatal pulmonary embolism (PE) occur in non-surgical patients. Thus, this study population of acutely ill medical patients is an important group in which to test the optimal therapy for preventing VTE."

Randomizing 8,101 patients from 52 countries, the researchers treated 4,050 patients with rivaroxaban for 35 days and 4,051 patients with enoxaparin for 10 days (both groups also received either an oral or subcutaneous placebo). The study's primary efficacy outcome was a composite of asymptomatic proximal DVT (detected by ultrasonography), symptomatic DVT, symptomatic non-fatal PE, and VTE-related death. The primary safety outcome was a composite of treatment-related major bleeding and clinically relevant non-major bleeding.

After a follow-up conducted at 10 days (to determine the non-inferiority of rivaroxaban), the researchers found that the two drugs performed to the same level with regard to the primary efficacy outcome, with 2.7 percent of patients in both drug cohorts experiencing this endpoint (relative risk ratio=0.968; p=0.0025 for non-inferiority, one-sided).

After a follow-up conducted at 35 days (to determine the superiority of rivaroxaban), the study team saw that rivaroxaban performed significantly better than enoxaparin followed by placebo, with 4.4 percent of patients experiencing the primary efficacy outcome compared to 5.7 percent, respectively (relative risk ratio 0.771, p=0.0211 for superiority, two-sided).

When the team examined the primary safety outcome, however, they found that the enoxaparin group demonstrated a significantly reduced rate of bleeding than the rivaroxaban group at both 10 and 35 days. Specifically, 1.2 percent of patients in the enoxaparin group experienced some kind of clinically relevant bleeding at the 10-day point, compared to 2.8 percent of patients in the rivaroxaban group (relative risk ratio=2.3; p< 0.0001). At 35 days, 1.7 percent of patients in the enoxaparin group experienced clinically relevant bleeding, compared to 4.1 percent of patients in the rivaroxaban group (relative risk=2.5; p<0.0001). Therefore, a consistent net clinical benefit with rivaroxaban could not be established in the heterogeneous population studied.

Cohen added that while rivaroxaban's significantly higher bleeding rate was a surprising finding, the rates of other adverse events - including cardiovascular problems, impacted liver function, and mortality - were similar in both groups.

"MAGELLAN investigated VTE prophylaxis in the largest and most diverse population of hospitalized, acutely ill patients to date, and managing the risk of blood clots in these patients is extremely complex due to their age, co-morbid conditions, and duration of immobilization," Cohen said. "As observed in previous studies in this area, we found an ongoing risk of VTE past the initial period of hospitalization. We did not see a consistently positive benefit-risk balance with rivaroxaban use, and thus further analysis is required to identify which groups of patients in MAGELLAN may derive benefit from thromboprophylaxis with rivaroxaban."

The study was funded by Bayer HealthCare and Johnson & Johnson Pharmaceutical Research & Development, L.L.C. Cohen reported serving as a medical consultant for and having received honoraria, consultancy fees, and clinical trial funding from Bayer, Boehringer Ingelheim, BMS, Daiichi Sankyo, GSK, Johnson & Johnson, Mitsubishi Pharma, Pfizer, Sanofi-Aventis, Schering Plough, and Takeda.

ACC2011特集

高齢者においては基礎疾患により降圧薬を選択すべきである

OSCAR：高齢高血圧患者において併用療法はアンジオテンシンII受容体拮抗薬単独と同様の結果をもたらす

OSCAR: Combination therapy produces similar outcomes compared to angiotensin II receptor blocker alone for elderly hypertensive patients

高齢高血圧患者をアンジオテンシンII受容体拮抗薬（ARB）とカルシウム拮抗薬（CCB）の併用で治療した場合の心血管イベントおよび死亡は高用量ARB単独で治療した場合と同様であると第60回American College of Cardiologyで発表された。日本人の研究者らは心血管疾患または2型糖尿病を有する高リスクの高齢高血圧患者1,164人を組み入れた。患者らは高用量オルメサルタン（1日40mg、578人）またはCCBとオルメサルタン（1日20mg、586人）併用を投与された。36ヵ月後に両群ともに血圧は適切にコントロールされていたが、血圧は併用療法の方が単剤療法よりも有意により低下した（平均SBPおよびDBPはそれぞれ2.4mmHg[p=0.0315]と1.7mmHg[p=0.0240]。）一次エンドポイント（心血管イベントおよび総死亡）発現数は単独療法群で58、併用療法群では48であり有意差はなかった（p=0.1717）。既存の心血管疾患を有する患者におけるサブ解析では、併用療法群の方が単剤療法群よりも心血管イベントおよび死亡発現数が有意に少なかった（それぞれ34および51、p=0.02610）。

Full Text

Treating elderly hypertensive patients with a combination of an angiotensin II receptor blocker (ARB) and a calcium channel blocker (CCB) leads to similar rates of cardiovascular events and death compared to therapy with a high-dose ARB alone, according to research presented at the American College of Cardiology's 60th Annual Scientific Session. The findings add to a growing body of knowledge on the best hypertension treatment for elderly patients.

Although CCBs have generally been recommended as the first-line treatment, ARBs have also been shown to exert beneficial effects on this patient population, especially in the SCOPE trial. The CASE-J trial - a Japanese study conducted in elderly patients - showed that a CCB and an ARB were equally effective in preventing cardiovascular morbidity and mortality.

"The CASE-J trial supported the idea that ARBs and CCBs are both beneficial as first-line agents for the treatment of hypertension in elderly patients," said Hisao Ogawa, M.D., Ph.D., lead study author and professor in the Department of Cardiovascular Medicine at Kumamoto University in Japan. "However, our research team did not know of any studies comparing the efficacy of high-dose ARB monotherapy with standard-dose combination therapy in terms of preventing cardiovascular morbidity and mortality in elderly patients. Thus, the OSCAR study may have a significant impact on determining the best antihypertensive therapeutic strategy for these patients."

For the study, Ogawa's research team enrolled 1,164 high-risk elderly hypertension patients at 134 centers throughout Japan from June 2005 to May 2007. To meet the inclusion criteria, patients must have been unable to manage their high blood pressure through standard-dose monotherapy with the ARB olmesartan (Benicar?, manufactured by Daiichi Sankyo) and had to have at least one of the cardiovascular diseases or type 2 diabetes. Patients were randomized to receive either: 1) high-dose olmesartan at 40 mg per day (n = 578) or 2) a CCB combined with olmesartan at 20 mg per day (n = 586).

The study's primary endpoint was a composite of cardiovascular events - including cerebrovascular disease, coronary artery disease, heart failure, other atherosclerotic disease, diabetic complications, and the deterioration of renal function - and all-cause death.

At a follow-up point of 36 months, the researchers found that blood pressure was adequately controlled by both treatment groups, although the combination therapy reduced blood pressure to significantly lower levels than monotherapy (mean SBP and DBP were lower by 2.4 mmHg [p = 0.0315] and 1.7 mmHg [p =0.0240], respectively). However, no significant difference was seen between the two cohorts in the number of primary endpoints, with 58 events occurring in the monotherapy group and 48 occurring in the combination group (Hazard ratio [HR] 1.31; 95 percent confidence interval [CI] 0.89 - 1.92, p = 0.1717).

The team did find a statistically significant difference, however, when conducting a subgroup analysis only on patients with pre-existing cardiovascular disease. In the subgroup analysis, study subjects randomized to the combination therapy group had significantly fewer occurrences of cardiovascular events and death than those in the monotherapy group, at 34 and 51, respectively (HR = 1.63; 95 percent CI, 1.06 - 2.52; p = 0.02610).

Conversely, another subgroup analysis including patients with only diabetes showed a higher incidence of the primary endpoint in the combination therapy group, at 14 events compared to seven events in the monotherapy group, although this difference was not statistically significant (HR = 0.52; 95 percent CI 0.21 - 1.28; p = 0.1445).

According to Ogawa, the data show that cardiologists should consider the type of risk factors that patients may have - such as cardiovascular disease or type 2 diabetes - before prescribing high-dose ARBs.

"The OSCAR study provides the first evidence showing that a standard dose of ARB plus CCB combination is superior to high-dose ARB treatment in reducing adverse events in elderly hypertensive patients with cardiovascular disease," Ogawa said. "However, high-dose ARB better prevented adverse events in diabetic patients in spite of its weaker antihypertensive effect."

The researchers received grant support for the OSCAR study from the Japan Heart Foundation. Ogawa has received grant support over the past five years from Astellas, AstraZeneca, Bayer, Boehringer Ingelheim, Daiichi-Sankyo, Eisai, Kowa, Kyowa Hakko Kirin, MSD, Novartis, Pfizer, Sanofi-Aventis, Schering-Plough, and Takeda.

ACC2011特集

バルサルタンとアムロジピンの有効性は同等

冠動脈バイパス術後1年間の開存率は伏在静脈グラフトと橈骨動脈グラフトとで同等である

Angiotensin II receptor blocker and calcium channel blocker produce similar results in patients with hypertension and gloucose intolerance

高血圧と耐糖能障害を有する患者の心血管イベントに対するアンジオテンシンII受容体拮抗薬（ARB）とカルシウム拮抗薬（CCB）の有効性を比較した初めての無作為化スタディにおいて、これらの2種類の薬剤間に有意差がないことが示されたと第60回American College of Cardiologyで発表された。日本の研究チームが2型糖尿病または耐糖能異常を有する高血圧患者1,150人をファーストライン治療として ARB（バルサルタン、575人）またはCCB(アムロジピン、575人)を投与する群に組み入れた。平均3.2年後に一次アウトカム項目（心筋梗塞、脳卒中、冠動脈血行再建術、うっ血性心不全による入院、および心臓突然死の合計）が発現したのはバルサルタン群で54人（9.4%）であり、アムロジピン群で56人（9.7%）であった（p=0.85）。これらの5項目のうち4つの発現率においても有意差はなく、唯一うっ血性心不全による入院のみ有意差が認められ、バルサルタン群で3人（0.5%）に発現し、アムロジピン群では15人（2.6%）であった（p=0.01）。総死亡率ーこのスタディの二次アウトカムーまたは有害事象に関しても有意差は認められなかった。

Full Text

In the first randomized study to compare the effects of an angiotensin II receptor blocker (ARB) to a calcium channel blocker (CCB) on cardiovascular outcomes in patients with hypertension and glucose intolerance, researchers found no significant difference between the two drug classes, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

The study follows several non-randomized analyses that also compared ARBs to CCBs, but because of conflicting results and a lack of a randomized trial, a definitive answer has yet to be established for the preferred first-line treatment for patients with hypertension and glucose intolerance. Both drug classes lower blood pressure by dilating blood vessels, but they accomplish this by blocking two distinct chemicals, calcium and angiotensin II.

"Angiotensin II receptor blockers were shown to reduce onset of type 2 diabetes and lower renal events, and so many treatment guidelines recommended them as the first-line medication for hypertensive patients with diabetes," said study researcher Toyoaki Murohara, M.D., Ph.D., professor at the Department of Cardiology at Nagoya University Graduate School of Medicine in Nagoya, Japan. "However, no study confirmed superiority of ARBs over CCBs in terms of the prevention of major cardiovascular events."

For the study, a Japanese research team enrolled 1,150 hypertensive patients with either type 2 diabetes or impaired glucose tolerance at 46 facilities across the country. Between October 2004 and July 2010, the patients were randomized to receive either an ARB (valsartan [Diovan?, manufactured by Novartis]; n = 575) or a CCB (amlodipine [Norvasc?, manufactured by Pfizer]; n = 575) as their first-line treatment.

The researchers followed the patients for an average of 3.2 years, conducting follow-up analysis every month for the first three months and every one to three months thereafter. As part of this follow-up, the team tested blood pressures and HbA1c levels to gauge how each patient's blood pressure and glucose intolerance progressed. In addition, they recorded cardiovascular events that occurred. Specifically, the team's primary outcome measure was a composite of acute heart attack, stroke, coronary revascularization, hospital admission due to congestive heart failure, and sudden cardiac death.

The team found that the primary outcome occurred in 54 patients (9.4 percent) who were taking valsartan and 56 patients (9.7 percent) who were taking amlodipine (hazard ratio, 0.97; 95 percent CI, 0.66 to 1.40; p = 0.85), an insignificant difference. When the team examined each component of the primary outcome individually, they also found no significant differences in four of the five events; only hospital admission for congestive heart failure showed a significant difference, with three patients (0.5 percent) in the valsartan group and 15 patients (2.6 percent) in the amlodipine group experiencing this outcome [HR, 0.20; 95 percent CI, 0.06-0.69; p = 0.01]. The researchers also found no significant difference in all-cause mortality - the study's secondary outcome - or in adverse events.

After analyzing the changes in blood pressure and HbA1c levels, the researchers once again found no significant differences between the two groups. Blood pressure was reduced to 131/73 mmHg in the valsartan group and 132/74 mmHg in the amlodipine group at 54 months. Both groups showed a steady decrease in HbA1c levels to 6.7 percent across the same time period.

"Our study showed no difference in the efficacies between ARBs and CCBs in terms of prevention of major cardiovascular events, although the ARB was superior to the CCB regarding the prevention of heart failure," Murohara said. "These results highlight the safety and efficacy of ARBs, especially in preventing heart failure in diabetic hypertensive patients. "

The study was funded and supported by Nagoya University Graduate School of Medicine. The Department of Cardiology at Nagoya University Graduate School of Medicine received research promotion grants from Actelion, Astellas, Bayer, Boehringer Ingelheim, Chugai, Daiichi Sankyo, Dainippon Sumitomo, Eisai, Fuji Film RI, Kaken, Kowa, Kureha, Medtronic, Mitsubishi Tanabe, Mochida, MSD, Novartis, Pfizer, Sanofi-Aventis, Schering-Plough, and Takeda. Research topics of the donation grants are not restricted.

ACC2011特集

Phase IIIの結果から、従来の治療が無効な高血圧の治療に圧反射活性化が有望であることが示された

新たなデバイスにより従来の治療の無効な高血圧患者の血圧を低下させることができる

New device lowers blood pressure in patients who are unresponsive to conventional therapy

頸部圧反射を刺激する新たなデバイスは重度のコントロール不良な高血圧患者が目標血圧を達成し維持させるのに役立つとの研究結果が第60回American College of Cardiologyで発表された。Rheos®システムを、3剤以上の降圧剤を内服して血圧が>160/80mmHgである難治性高血圧患者265人に埋め込んだ。患者らは2つのグループに無作為に割り付けられた。グループAのデバイスはスタディ全期間の12ヵ月間圧反射刺激療法を行った。グループBの患者はスタディ前半ではコントロール群となり、6ヵ月後からデバイスが治療を開始するようにプログラムされた。両群ともに収縮期血圧（SBP）の有意な低下を示した。グループAにおいては6ヵ月後に41%の患者において、12ヵ月後には54%の患者においてSBPが目標まで低下した。グループBにおいては驚くべき多大なプラセボ効果が認められた。コントロール期間中に21%が目標SBPを達成し、治療6ヵ月後には46%が目標範囲内であった。12ヵ月後のSBP低下は6ヵ月後に認められた血圧低下の50%以上であり、効果が持続していることが示唆された。拡張期血圧も両群において同様の期間に低下した。

Full Text

A novel device that works with the body's natural mechanisms helps patients with severe and uncontrolled hypertension achieve and maintain target blood pressure levels, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

The Rheos® System device is implanted just below the collarbone, like a pacemaker, and delivers four to six volts of electricity to the carotid arteries. The pulses mimic a spike in blood pressure that activates a process called carotid baroreflex. This approach, known as baroflex activation therapy, tricks the brain into harnessing a network of sensors throughout the body that cause blood pressure to drop.

"People with resistant hypertension are a growing group, and they're in desperate need of additional treatments," said John D. Bisognano, M.D., Ph.D., professor of medicine in the Cardiology Division of the University of Rochester, Rochester, N.Y. "The drugs available now are good for most people with hypertension, but people with resistant sky-high blood pressure need more, and it is important that we develop treatments for this growing set of people."

In this multicenter, Phase III study, the device was implanted in 265 patients with resistant hypertension of >160/80 mmHg who were taking at least three blood pressure drugs, including a diuretic. All patients were then randomly assigned to two groups in a 2-to-1 ratio. The number of medications was similar in the two groups but could not be controlled in the study because most patients had blood pressure far above their goals; thus, physicians often changed their medications. Group A's devices delivered baroflex activation therapy for the study's full 12-month duration. Group B patients served as the control group for the first half of the study, and at six months their devices were programmed to begin treatment. The target for systolic blood pressure (SBP), the top number, was <140, and patients were seen monthly. If the patients had not reached the target SBP, the device was adjusted on an individual basis to assert more voltage and further reduce blood pressure.

Both groups showed significant reductions in SBP. In Group A, SBP decreased to target levels for 41 percent of patients after six months and 54 percent after 12 months. Group B showed a surprisingly large placebo effect, even though patients and clinicians were blinded to treatment until after the 12-month visit. Twenty-one percent achieved target SBP during the control phase, and 46 percent were in the target range after six months of treatment. Reductions in SBP at 12 months were at least 50 percent of those seen at six months, demonstrating a sustained response.

Diastolic blood pressure also fell in both groups at both time periods. Although the trial did not meet all primary endpoints, the data showed that the therapy significantly reduced blood pressure in patients with resistant hypertension. At 12 months, there was an 88 percent responder rate - a 35 mmHg blood pressure drop and a decrease in left ventricular mass. Future trials need to incorporate measures to improve variability in blood pressure in subjects.

"This system is safe, and its effect is as good as two or three drugs for people who are already taking five or six drugs and still can't control their hypertension," Bisognano said. "It's a good additional option for these patients."

The study was sponsored by CVRx, Inc., which developed the RheosR System. Bisognano is a consultant for CVRx, Inc. and has received consulting fees and research support from the company.

ACC2011特集

ヨガにより心房細動発作頻度が低下する

ヨガは心房細動の安全で有効な治療法である

Yoga found to be a safe, effective therapy in treatment of atrial fibrillation

厳格なヨガの実践は心房細動にしばしば関連する不規則な心調律の発作頻度を軽減し不安やうつ症状を改善するのに役立つ。平均して、ヨガは心房細動発作を半分に減少させQOLを有意に改善したとの研究結果が第60回American College of Cardiology学会で発表された。この前向き自己コントロール単施設スタディにおいて、研究者らは身体的に制限のない心房細動患者49人を追跡した。参加者は最初の3ヵ月のコントロール期間中に、どんなタイプの運動にでも参加することを許可された。その後3ヵ月間のスタディ期に、呼吸練習、ヨガポーズ、瞑想およびリラクゼーションから成る監視下ヨガに参加した。このヨガ治療により心房細動患者における不規則な心調律発作数はコントロール期間中と比較しスタディ期間中に有意に減少した（3.8±3対2.1±2.6、p<0.001）。ヨガによりうつおよび不安スコアも低下し（p<0.001）身体機能、全体的な健康、活気、社会的機能、および精神衛生上におけるQOLは改善した（それぞれのp値は0.017、<0.001、<0.001、0.019および<0.001）。

Full Text

Rigorous practice of yoga can help reduce episodes of irregular heartbeat and improve the symptoms of anxiety and depression often associated with atrial fibrillation. On average, yoga was found to cut patients' episodes of atrial fibrillation in half and significantly improve quality of life, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

Previous research has demonstrated the positive impact of yoga on overall heart health, but this is the first study to examine the benefits of yoga specifically on patients with atrial fibrillation.

"The practice of yoga is known to improve many risk factors for heart disease including high blood pressure, high cholesterol, hardening of the arteries, and stress and inflammation in the body," said Dhanunjaya Lakkireddy, M.D., associate professor of medicine and director of the Center for Excellence in Atrial Fibrillation, Cardiovascular Research Institute, Mid America Cardiology, University of Kansas Hospital, Kansas City, Kansas and lead investigator of the study. "There are currently no proven complementary therapies that are known to help decrease the symptoms of atrial fibrillation in a noninvasive fashion with minimal side effects and reasonable safety and efficacy."

In this prospective, self-controlled, single-center study, researchers followed 49 patients with atrial fibrillation who had no physical limitations. During the first three-month control phase, participants were permitted to engage in any type of physical activity they were previously accustomed to doing. This was followed by a three-month study phase where patients participated in a supervised yoga program consisting of breathing exercises, yoga postures, meditation and relaxation. Forty-five minute yoga sessions were administered by a certified professional three times a week over the course of the study phase. Participants were also given an educational DVD and encouraged to practice the exercises at home on a daily basis depending on their comfort levels. All participants were new to the practice of yoga, and the program was designed to allow beginners to progress safely from basic movements to more advanced practice over the course of the study.

Episodes of irregular heartbeat were measured throughout the entire six-month study period using portable heart monitors and patient symptom logbooks. Participants were also asked to complete short self-administered surveys to assess anxiety, depression and quality of life scores during the control and study phases, and the differences were examined.

Data showed the yoga intervention significantly reduced the number of episodes of irregular heart beat among atrial fibrillation patients during the study phase compared to the control phase where subjects were participating in the physical activity of their choice (3.8±3 vs. 2.1±2.6, p<0.001). Yoga also reduced depression and anxiety scores (p<0.001) and improved quality of life scores in the areas of physical functioning, general health, vitality, social functioning, and mental health (p values of 0.017, <0.001, <0.001, 0.019 and <0.001, respectively).

"These findings are important because many of the current conventional treatment strategies for atrial fibrillation include invasive procedures or medications with undesirable side effects. Success with these therapies varies widely, and they are often only modestly effective in controlling heart rhythm," Lakkireddy said. "It appears yoga has a significant impact on helping to regulate patients' heart beat and improves their overall quality of life. Any intervention that helps in reducing or controlling the arrhythmia burden in atrial fibrillation can have a huge impact on public health."

Given the low cost, safety and effectiveness of yoga, the authors recommend that it be considered in the overall treatment strategy for atrial fibrillation and other complex heart rhythm disorders.

ACC2011特集

小児における広範な脂質スクリーニングが推奨される

HDLコレステロールレベルの低い小児はしばしば他の心血管リスクファクターを有する

Children with low levels of HDL cholesterol often found to have other cardiovascular risk factors

高密度リポ蛋白（HDL）コレステロールレベルの低いミドルスクールの生徒は、後に心血管系の健康状態を不良とさせる可能性のある他のリスクファクターをも有する確率が高いようであるとの研究結果が、第60回American College of Cardiology学会で発表された。このスタディは米国の学校ベースの介入プログラムに組み入れられた6学年児1,104人を対象とした。研究者らは同意した生徒から脂質および血糖値、ボディマスインデクス（BMI）、血圧、心拍数および食事、運動および運動不足の習慣を評価した標準的なアンケートなどのデータを収集した。その後彼らは、HDL≤40mg/dLまたはHDL>40mg/dLの2群の生徒を比較した。計177人（16%）が低HDLを有していた。彼らのうち、62%以上が過剰体重であった。HDL≤40mg/dLの小児はまたHDLレベルの高い小児と比較し、高血圧も有し中性脂肪レベルも高値であった。また身体活動レベルも低かった（1週間当りの中等度以上の運動をする日数が少なかった）。さらなる研究が必要ではあるが、このスタディから、小児に対する広範なコレステロールスクリーニングにより早期介入を行い生涯にわたる心疾患リスク軽減に役立てることが推奨される可能性がある、と筆者らは述べている。

Full Text

Low levels of high density lipoprotein (HDL) cholesterol have been linked to an increased risk of heart disease among adults, but few studies have looked at low HDL among children. New data find that low HDL levels may be common in children, too, adding to the evidence that HDL may need further consideration when assessing children's health. Middle school students with low levels of HDL also appear more likely to have other risk factors that potentially put them at risk for poor heart health later on, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

"The association of low HDL cholesterol with unhealthy behaviors, being overweight, higher blood pressure and an unfavorable lipid profile in kids is clearly seen in this study," said Elizabeth Jackson, M.D., M.P.H., assistant professor of medicine, Division of Cardiovascular Medicine, University of Michigan Health System, Ann Arbor, Michigan, and senior author of the study. "Cardiovascular disease doesn't just start in adulthood, and there may be factors that could help us identify during youth or adolescence who might be at increased risk for developing health problems later on."

As previous studies have shown, components of the lipid profile including LDL and HDL can track into adulthood and are associated with a risk for heart disease later in life. Jackson says there is a need to better understand the prevalence of HDL in youth and how it plays a role in heart health.

The present study involved 1,104 sixth graders enrolled in Project Healthy Schools, a school-based intervention program in southeastern Michigan. Researchers collected data from consenting students, including lipid and glucose levels, body mass index (BMI), blood pressure, heart rate and a standardized questionnaire assessing dietary, exercise and sedentary habits. They then compared two groups of students: those with HDL ≤40mg/dL and those with HDL >40 mg/dL.

A total of 177 students (16 percent) had low HDL. Of these, more than 62 percent were overweight. Children with an HDL ≤40 mg/dL also had higher blood pressure and triglyceride levels compared to children with higher levels of HDL. They were also more likely to be physically inactive (fewer days of moderate exercise reported per week).

"When we look at the relationship between lipids and weight in kids, a healthier lifestyle during childhood may be a very important contribution to preventing heart problems in adulthood," Jackson said. "Focusing on reducing body mass index and increasing exercise are two lifestyle changes that parents and schools can both take part in that can help improve overall health in their children."

Although further research is needed, authors say this study may suggest broader-based cholesterol screening for children to intervene earlier to help reduce lifelong risk of heart disease. In 2008, the American Academy of Pediatrics (AAP) adopted new cholesterol screening guidelines due to the increasing epidemic of childhood obesity and subsequent risk of type 2 diabetes, high blood pressure and cardiovascular disease in older children and adults. AAP now recommends lipid screening for children with a family history of lipid abnormalities, as well as overweight children regardless of family history or other factors. The National Heart Lung and Blood Institute states that lipid screening in children should start as early as age 2 if they have a parental history of high cholesterol (total cholesterol > 240 mg/dl) or a family history of early heart disease.

This study was funded, in part, by Mardigian Foundation, Hewlett Foundation, Adkins Foundation, AstraZeneca Foundation, Robert & Ellen Thompson Foundation, James Nicholson, and NuStep Inc.

ACC2011特集

新たなポリマーにより1年後の標的病変不全が軽減できる

RESOLUTE US：新世代のzotarolimus溶出ステントはステント血栓が少なく標的病変不全率が低い

RESOLUTE US: Next-generation zotarolimus-eluting stent exhibits low rate of target lesion failure with minimal stent thrombosis

ヨーロッパのトライアルを拡大することによりzotarolimus溶出ステント(Resolute®)が米国患者において12ヵ月間の重要な安全性イベント低発現率を維持し臨床的な再狭窄低発現率を達成したと第60回American College of Cardiology学会において発表されJournal of the American College of Cardiology 4月26日号に掲載された。1,402人の患者を組み入れ、メインのスタディでは1,112人の患者に径2.5～3.5mmのResolute®ステントが植え込まれた。このメインのスタディとEndeavor®ステントの臨床試験から得た過去のデータを比較した。Resolute®ステントの12ヵ月間の標的病変不全（TLF）率は3.7%であったのに対し、過去のコントロールにおけるその割合は6.5%であり、今回のスタディで予め設定された非劣性のマージンを満たした（p<0.001）。Resolute®ではまた標的病変の再血行再建術施行率、心臓死率および標的血管による心臓発作率がそれぞれ2.0%、0.4%、および1.3%であり、過去のコントロール群のEndeavor®植え込み患者より低かった（それぞれ4.0%、0.8%、および2.4%）。スタディ患者1,402人全体においてもResolute®ステントにおいては良好な成績が示され、標的病変不全率は4.7%であり、ステント血栓が確実または可能性が高いものの割合は0.1%であった。

Full Text

Expanding on European clinical trials, researchers found that the Resolute® stent achieved a low rate of clinical restenosis while maintaining low rates of important safety events at 12 months in a U.S. patient population, according to research presented at the ACC.11 and published in the April 26 edition of the Journal of the American College of Cardiology.

The RESOLUTE U.S. trial met its primary endpoint of non-inferiority to the historical control, the FDA-approved Endeavor® stent. It is the first U.S. study to observe the effect of drug elution characteristics on clinical outcomes. Both the Endeavor® stent and the Resolute® stent are designed with the same cobalt chromium platform and use the same drug (zotarolimus), but the Resolute® uses a new biocompatible polymer that allows for an extended drug release across approximately six months (compared to a 14-day release with Endeavor®). This extended release is hypothesized to better prevent vessel renarrowing while still maintaining low stent thrombosis rates.

"The Resolute® drug-eluting stent was shown in this study to deliver strong efficacy without a trade-off in safety through one year of patient follow-up," said Martin B. Leon, M.D., associate director of the Center for Interventional Vascular Therapy and Professor of Medicine at Columbia University/New York Presbyterian Hospital. "The clinical results achieved with this new device show the important role that biocompatible polymers play in the design of drug-eluting stents."

Enrolling 1,402 patients across 116 U.S. investigational centers between August 2008 and December 2009, the research team conducted four analyses. The main study included 1,112 patients who received Resolute® stents that were 2.5-3.5 mm in diameter.

The primary endpoint for this group was 12-month target lesion failure (TLF; the composite of cardiac death, target-vessel heart attack, and clinically-driven target lesion revascularization). Clinical follow-up was performed at 30 days, six months, nine months, and 12 months; it will continue at 18 months and annually thereafter through five years post-procedure.

The researchers compared the data from this main study group with historical data pulled from clinical trials of the Endeavor® stent. In order to make accurate comparisons, the team used similar inclusion characteristics, data collection methodologies, endpoint definitions, and statistical analyses. They used propensity score method to adjust for baseline covariates.

After conducting this analysis, the research team found that the Resolute® stent's rate of TLF at 12 months was 3.7 percent, compared with 6.5 percent for the historical control patients who received the Endeavor® stent, meeting the study's pre-set margin of non-inferiority (rate difference equals -2.8 percent, upper one-sided 95 percent confidence interval -1.3 percent, p <0.001).

After looking at the individual components of the primary endpoint, the team found that the Resolute® stent also had lower rates of target lesion revascularization, cardiac death and target-vessel heart attack, at 2.0 percent, 0.4 percent, and 1.3 percent, respectively (compared to 4.0 percent, 0.8 percent, and 2.4 percent for the historical control Endeavor® patients).

Evaluation of the entire 1,402-person study group (which included patients with one or two lesions who received stents ranging from 2.25 mm to 4.0 mm) also showed strong outcomes for the Resolute® stent, including a 4.7 percent rate of target-lesion failure and a 0.1 percent of definite or probable stent thrombosis. The overall population included 34 percent diabetic patients, the highest to date in any of the Resolute? trials.

"The outcomes achieved in the diabetic group are better than expected and we can postulate that the Resolute's® prolonged drug elution profile may contribute to these favorable outcomes in this high-risk group," Leon said.

Although the study was not a randomized trial, the researchers noted that the propensity score method did allow the team to adequately estimate the effect of changing one of the stent's three components.

The study was funded by Medtronic. Leon serves on the scientific advisory board for Medtronic.

ACC2011特集

宇宙での心臓超音波検査により地球上での心臓管理が改善する可能性がある

宇宙飛行士における無重力による早期心機能低下を予知するのに数学的モデルが役立つ可能性がある

Mathematical models may help predict early deterioration of heart function due to weightlessness among astronauts

宇宙飛行士は宇宙探査から帰還した後にしばしばふらふら感を訴えたり意識を失ったりするが、起立性低血圧の原因はいまだ明らかにされていない。研究者らは国際宇宙ステーション（ISS）上で施行した心臓超音波検査のデータを収集し、心筋量が宇宙で減少するか、さらにこれにより宇宙飛行士が地球に戻った時の起立性低血圧に影響するかを調査しその答えを模索している。第60回American College of Cardiology学会で発表された研究結果によると、これらのデータを用いた数学的モデルは無重力による早期心機能低下を予知するのに役立つようである。このスタディの一環として研究者らは、より良いインターフェイスおよびコンピュータプラットホームを開発しており、これにより心臓超音波や磁気共鳴画像（MRI）のデータを心臓モデルに迅速に統合でき、様々なタイプの心疾患を解析することが可能となる。つまり、これにより航空医官および研究者らが宇宙での心血管機能変化を予測しこれらの変化を予防する対策をデザインできる。この予測モデルはまた宇宙プログラムを遥かに超え臨床に適用できることも期待されている。

Full Text

Astronauts frequently become lightheaded or pass out after returning from space explorations, but the reason for orthostatic hypotension remains unclear. Researchers are searching for the answers by collecting data from echocardiograms performed on board the International Space Station (ISS) to determine if the heart loses muscle mass in space and whether this contributes to orthostasis when astronauts return to Earth. Mathematical modeling using these data appear to be promising in helping to predict early deterioration of heart function due to weightlessness, according to research presented at the American College of Cardiology's 60th Annual Scientific Session.

As part of this study, researchers are developing improved interfaces and computational platforms that will allow them to rapidly integrate echocardiography and magnetic resonance imaging (MRI) data into cardiac models to analyze multiple types of heart disease.

In short, this will allow flight surgeons and researchers to predict changes in cardiovascular function in space and design countermeasures to prevent these alterations. This predictive modeling is also expected to have clinical applications well beyond the space program.

"There is a great need to understand what happens to the heart in space before we can venture further out, eventually to Mars and beyond," said James D. Thomas, M.D., staff cardiologist at the Cleveland Clinic and senior author of the study. "This work will also have great impact on the care of patients on Earth since our mathematical modeling will be applicable to all kinds of heart-related problems, such as heart failure and coronary artery disease."

In this study, a group of patients with cardiomyopathy underwent echocardiography to measure cardiac strain, which is said to be one of the best parameters for judging cardiac function. "In its simplest form, strain is the proportional change in length of a muscle," Thomas said. "If a 10-inch rubber band were stretched to 11 inches, this would reflect a 10 percent strain."

Echocardiographic images were obtained with a modern instrument, as well as an aging HDI-5000 at the Cleveland Clinic, similar to the 12-year-old machine on the space station, which was not originally designed to measure strain. The data were analyzed with multiple customized software packages and yielded comparable strain results, both for the heart as a whole and for individual ventricular walls.

"This means that strain measurements made with one instrument can be compared with subsequent imaging on other machines, allowing much wider application of this promising technique, even with machines not specifically designed to measure strain," Thomas added.

This study is part of an extensive project funded by NASA called the Integrated Cardiovascular Study in which astronauts undergo detailed echo and MRI exams before and after flight, as well as monthly echoes in flight, to determine the extent and timing of changes in cardiac function in space.

Armed with these strain maps and other data from astronauts in space and patients on the ground, engineers at the NASA Glenn Research Center in Cleveland and at the University of Auckland, New Zealand, have begun to develop mathematical models to define the heart's response to weightlessness and several disease states. While it will be several years before the Integrated Cardiovascular Study will be completed, authors report that this modeling work is already yielding insights into the diagnosis and treatment of heart disease.

This study is funded by the National Space Biomedical Research Institute through NASA Cooperative Agreement NCC9-58.

ACC2011特集

抗うつ薬は動脈壁肥厚と関連がある

SSRIおよび他の抗うつ薬は頸動脈内中膜肥厚と関連がある
SSRIs and other antidepressants linked to higher carotid intima media thickness

抗うつ薬使用と動脈壁肥厚に関連があり、心疾患および脳卒中リスクとなる可能性があることが双子の退役軍人のスタディの結果示されたと第60回American College of Cardiology学会で発表された。このスタディでは、2人ともがベトナム戦争の間に米国軍隊に従事した中年男性の双子513人を対象とした。研究者らは頸動脈内中膜厚（IMT）を超音波で計測した。その結果、選択的セロトニン再取込み阻害薬を内服している者（これらのうち60%が抗うつ薬を内服）および他の抗うつ剤を内服している者両者において頸動脈IMTが大であることが確認された。片方のみが抗うつ剤を内服していた双子59組において、標準的な心疾患リスクを考慮に入れても、薬剤を内服している者の方がIMTは大である傾向にあった。この影響は心筋梗塞または脳卒中の既往の有無に関係なくいずれの双子においても認められた。抗うつ剤を内服している者のみで観察すると、うつ症状レベルが高いほどIMTもまた大であった。

Full Text

Antidepressant use has been linked to thicker arteries, possibly contributing to the risk of heart disease and stroke, in a study of twin veterans. The data was presented Tuesday, April 5 at the American College of Cardiology 60th Annual Scientific Session.

Depression can heighten the risk for heart disease, but the effect of antidepressant use revealed by the study is separate and independent from depression itself, says first author Amit Shah, M.D., a cardiology fellow at Emory University School of Medicine. The data suggest that antidepressants may combine with depression for a negative effect on blood vessels, he says. Shah is a researcher working with Viola Vaccarino, M.D., Ph.D., chair of the Department of Epidemiology at Emory's Rollins School of Public Health.

The study included 513 middle-aged male twins who both served in the U.S. military during the Vietnam War. Twins are genetically the same but may be different when it comes to other risk factors such as diet, smoking and exercise, so studying them is a good way to distill out the effects of genetics, Shah says.

Researchers measured carotid intima-media thickness by ultrasound. Among the 59 pairs of twins where only one brother took antidepressants, the one taking the drugs tended to have higher carotid intima-media thickness (IMT), even when standard heart disease risk factors were taken into account. The effect was seen both in twins with or without a previous myocardial infarction or stroke. A higher level of depressive symptoms was associated with higher IMT only in those taking antidepressants.

"One of the strongest and best-studied factors that thickens someone's arteries is age, and that happens at around 10 microns per year," Shah says. "In our study, users of antidepressants see an average 40 micron increase in IMT, so their carotid arteries are in effect four years older."

Antidepressants' effects on blood vessels may come from changes in serotonin, Shah says. The most commonly prescribed antidepressants are selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine, which increase the level of serotonin in the brain. Other types of antidepressants also affect serotonin levels, and antidepressants can act on other multi-functional brain chemicals such as norepinephrine.

In the study, researchers saw higher carotid IMT in both participants who used SSRIs (60 percent of those who took antidepressants) and those who used other types of antidepressants.

Most of the serotonin in the body is found outside the brain, especially in the intestines, Shah notes. In addition, serotonin is stored by platelets, the cells that promote blood clotting, and is released when they bind to a clot. However, serotonin's effects on blood vessels are complex and act in multiple ways. It can either constrict or relax blood vessels, depending on whether the vessels are damaged or not.

"I think we have to keep an open mind about the effects of antidepressants on neurochemicals like serotonin in places outside the brain, such as the vasculature. The body often compensates over time for drugs' immediate effects," Shah says. "Antidepressants have a clinical benefit that has been established, so nobody taking these medications should stop based only on these results. This isn't the kind of study where we can know cause and effect, let alone mechanism, and we need to see whether this holds up in other population groups."

ACC2011特集

ハリケーンカトリーナから数年経っても慢性ストレスは持続している

ハリケーンカトリーナの4年後でも心筋梗塞リスクは3倍の状態が持続している
Four years after Hurricane Katrina, three-fold risk of myocardial infarction persists

ハリケーンカトリーナによる災害から4年経っても、嵐による破壊を受けたニューオーリンズの住民においては心筋梗塞発症率の高い状態が持続している。新たなデーター同じ研究者らのハリケーンカトリーナ2年後の解析の最新版ーの結果、AMIリスクが3倍であることおよび他の好ましくない影響が持続していることが示されたとの研究結果が第60回American College of Cardiology学会で発表された。この単施設レトロスペクティブ観察研究において研究者らは、カトリーナ前後の2群の差を観察した。カトリーナ後の群においては、調査が行われた計29,228人中AMIによる入院と確認されたのが629件（2.2%）であったのに対し、カトリーナ前においては計 21,229人中AMIによる入院は150件（0.7%）であった（p<0.0001）。カトリーナ後の群の方が、初回入院（32%対17%、p<0.001）、精神医学的併存疾患（10%対6%、p<0.05）、脂質異常症（45%対52%、p=0.01）、冠動脈疾患既往歴（46%対31%、p=0.001）、カテーテル冠動脈インターベンション施行（66%対52%、p<0.0001）の数が多かった。AMIリスク上昇の継続は、一般的なリスクファクターには何の変化もないにもかかわらず認められた。研究者らは、慢性的なストレス、全面的な移動および統合的な公共医療サービスの欠如が影響していると考えている。

Full Text

Residents of storm-ravaged New Orleans continue to have higher rates of myocardial infarction four years after the Hurricane Katrina struck. New data - an update to the researchers' two-year post-Hurricane Katrina analysis - show a persisting three-fold increase in acute myocardial infarction (AMI) along with other negative effects, according to research presented today at the American College of Cardiology's 60th Annual Scientific Session.

While previous studies have found increases in heart attacks and other cardiac events occurring in the immediate hours to weeks after major disasters such as earthquakes or volcano eruptions, authors say this is the first long-term retrospective analysis of this nature, and the first to investigate heart health in the aftermath of Hurricane Katrina.

"To our surprise, the persistent three-fold increase in heart attack risk has occurred in the absence of any change in traditional risk factors - for example, age, high blood pressure, obesity and diabetes," said Anand Irimpen, M.D., associate professor of medicine for the Heart and Vascular Institute at Tulane University School of Medicine Center and chief of cardiology of the Southeast Louisiana Veterans Health Care System. "We had some indication of Katrina's effect on heart health from our initial study, but it appears to be more far-reaching than expected. The factors we looked at two years ago have generally become more significant and new factors have emerged that appear to play a role in heart health."

While psychiatric co-morbidities (e.g., depression, schizophrenia, bipolar and anxiety disorder), a history of coronary artery disease and marital status did not appear to contribute to heart attacks in the two-year analysis, these factors seem to play a significant role as time has progressed. Irimpen supposes there might be a lag phase between the onset of psychiatric illness and its somatic manifestation in the form of a heart attack.

"Certainly chronic stress appears to play an ongoing role," Irimpen said. "It's leading to what I view as akin to a Post-Katrina Stress Disorder. Many of the patients we see are not yet back to their pre-Katrina residences, have not regained employment and are too stressed to pay attention to ideal health practices. They are more likely to smoke, overuse alcohol or other substances and are less likely to comply with treatment plans that can help prevent heart attacks."

In this single-center, retrospective, observational study, patients admitted with heart attacks to Tulane Medical Center in the two years before Katrina and the four years after the hospital reopened (five months after Katrina) were identified from hospital records. Researchers looked for differences in the incidence of heart attacks and compared the two groups (pre- and post-Katrina) based on specific demographic and clinical data (e.g., lab test results, health insurance, first-time hospitalization, medical non-adherence, smoking status, substance abuse, employment). In the post-Katrina group, there were 629 confirmed admissions for AMI, out of a total census of 29,228 patients (2.2 percent), as compared to 150 AMI admissions out of a total 21,229 patients (0.7 percent) in the pre-Katrina group (p<0.0001).

Compared to the pre-Katrina group, those experiencing a heart attack post-Katrina were more likely to be unemployed (17 percent vs. 2 percent, p<0.0001), lack medical insurance (12 percent vs. 6 percent, p<0.0001), smoke (58 percent vs. 17 percent, p<0.001), be less compliant with treatment plans (25 percent vs. 7 percent, p<0.0001) and report substance abuse (16 percent vs. 7 percent, p<0.01).

The post-Katrina group had more first time hospitalizations (32 percent vs. 17 percent, p<0.001), psychiatric comorbidities (10 percent vs. 6 percent, p<0.05), hyperlipidemia (45 percent vs. 52 percent, p=0.01), history of coronary artery disease (46 percent vs. 31 percent, p=0.001), and percutaneous coronary interventions (66 percent vs. 52 percent, p<0.0001). More people in the post-Katrina group were single or divorced (30 percent vs. 26 percent, p<0.05). Similar to the 2-year data, heart attack patients were more likely local residents rather than visitors (p<0.0001) or people living in temporary housing (p<0.0001). These differences were all statistically significant and the groups were comparable in terms of age, race, and gender, and history of hypertension, diabetes mellitus and chronic renal disease.

"As clinicians, we must pay closer attention to patients affected by Hurricane Katrina and other major disasters as they seem to have long-term and detrimental effects on the health of the community," Irimpen said. "We hope our findings will have enduring ramifications on improving surveillance, prevention efforts and cardiovascular care in New Orleans."

ACC2011特集