MI後の魚油に関する有益性が追加された (Abstract 913-08)

OMEGA-REMODEL：オメガ3脂肪酸は心筋梗塞後の傷害心筋を保護するようである

OMEGA-REMODEL: Omega-3 fatty acids appear to protect damaged heart after myocardial infarction

オメガ3脂肪酸摂取は、既に最適な標準治療を受けている心筋梗塞（MI）後間もない既往者の炎症を抑え心機能のさらなる低下を防ぐようである、とのトライアルの結果が第64回American College of Cardiology学会で発表された。研究者らは、MIから回復中で標準的な治療を受けている米国の患者374人を4gのオメガ3脂肪酸またはプラセボを摂取する群にランダムに割り付けた。MI後2～4週および6か月後に再度、血液検査および心臓画像検査の解析が施行された。MI後オメガ3カプセルを毎日6か月間内服した患者は、プラセボを内服した患者に比べ心機能低下を示す確率が39%低かった。オメガ3脂肪酸を内服した患者ではまた、線維化の痕跡が有意に少なかった。特に、6か月後の心筋リモデリングおよび組織線維化のマーカーであるST2の低下率は、治療群においてかなり大きかった。このスタディの多くの患者の6か月後の血中オメガ3濃度の増加は、オメガ3脂肪酸の豊富な食事をする日本人集団の値と同等であった。

Full Text

Taking omega-3 fatty acids appeared to lower inflammation and guard against further declines in heart function among recent myocardial infarction (MI) survivors already receiving optimal standard care, according to results from a randomized, controlled trial presented at the American College of Cardiology's 64th Annual Scientific Session in San Diego.

Patients in the study taking 4 grams of prescription-only omega-3 fatty acid capsules daily for six months after an MI were significantly more likely to show improvements in heart function compared to patients taking a placebo. Heart function was measured by an expansion of the left ventricular end-systolic volume index. Patients taking omega-3 fatty acids also had significantly less evidence of fibrosis. The data suggests that patients who were able to mount a substantial change in levels of omega-3 fatty acids in their blood derived the most benefit.

"Giving a high dose of omega-3 fatty acids soon after a heart attack appears to improve cardiac structure and heart functioning above and beyond the standard of care," said Raymond W. Kwong, M.D., M.P.H, director of cardiac magnetic resonance imaging at Brigham and Women's Hospital in Boston and the study's senior author. "Because this is a unique group of patients with remarkably high adherence to [guideline-directed] treatments for acute myocardial infarction already, we feel fairly confident that the benefits from this therapy are additive. The implications of this study could be fairly large."

Although earlier studies have shown that omega-3 fatty acids may lower the risk of arrhythmias and death from an MI, research has not consistently shown a benefit. Kwong said his research is the first to use quantitative cardiac imaging to look at how omega-3 fatty acids might actually protect the heart after a major MI.

Researchers randomized 374 patients recovering from an MI and receiving standard treatment to take either 4 grams of omega-3 fatty acids or a placebo; groups were balanced in terms of location of the infarct—anterior or non-anterior—and age. Blood work and cardiac imaging were analyzed at two to four weeks post-MI and again at six months. Compared to previous research, this study used a much higher dose of omega-3 fatty acids, 4 grams compared to 1 gram daily, and a small amount of corn oil, which does not contain fatty acids, as the placebo.

By using cardiac magnetic resonance imaging, researchers were able to look at changes in patients' hearts and see the disease process before and after treatment. Adverse changes in left ventricular remodeling and function, in addition to the worsening of fibrosis, were used as surrogates for poor outcomes after MI. Patients taking the omega-3 fatty acids were 39 percent less likely to show a deterioration of heart function as compared to patients taking a placebo. The analysis also looked at key markers of systemic inflammation, which were also more likely to be improved in those taking the fish oil. In particular, the percent reduction in ST2, a marker of the severity of adverse cardiac remodeling and tissue fibrosis, was substantially greater in the treatment arm after six months.

"Omega-3 fatty acids may have anti-inflammatory effects and also promote better cardiac healing," Kwong said. "This is important because other anti-inflammatory agents, including steroids and NSAIDS, have failed to make a difference after myocardial infarction."

Patients in the study who had a 5 percent increase in the amount of omega-3 fatty acid in their blood seem to have the best chance of improving heart function.

"If this becomes a useful therapy, it seems a 5 percent increase in the serum level of omega-3 fatty acids correlates with a 10 percent improvement in left ventricular remodeling," he said. In this study, most (92 percent) of patients randomized to fish oil increased omega-3 fatty acid by at least 5 percent, compared with less than half (42 percent) of patients receiving placebo.

Kwong said the higher-dose omega-3 fatty acids was not found to be associated with any major safety issues, such as increased bleeding.

"It's a very well-tolerated therapy," he said, adding that it is unlikely patients could get the amount of omega-3 fatty acids from diet alone. He said the daily 4-gram dose is roughly equivalent to someone eating a large, 8-ounce serving of salmon every day for six months.

For many years, the American College of Cardiology and the American Heart Association have recommended that people eat fish rich in omega-3 fatty acids at least twice a week because of its potential heart benefits. Kwong said most North Americans do not follow this advice, while Japanese populations with higher levels of omega-3 and an otherwise similar risk profile to North Americans have lower risks of heart disease and sudden cardiac death. The increase in the omega-3 blood content of many patients in Kwong's study at six months was similar to levels found in Japanese populations with a diet very rich in omega-3 fatty acids.

Fatty fish such as salmon, tuna, trout and sardines contain the most omega-3 fatty acids. Fatty acids are a key component of cell membranes and they help with cell signaling, proper immune function and may also improve cognitive functioning.

This study is limited in that it did not investigate the association between omega-3 fatty acids and cardiac events after MI; assessing this relationship would require a large group of patients over many years. It also did not evaluate this treatment immediately after having a heart attack.

The study was funded by the National Institutes of Health. GlaxoSmithKline provided the medication for the study, but the authors report the pharmaceutical company was not involved with the study or its analysis.

ACC2015特集

心血管系リスクファクターを回避することで健康でいられる年数が増加する(Abstract 1126M-05)

45歳までに一定のリスクファクターを回避することにより心不全発症が有意に遅延する
Avoiding certain risk factors by age 45 significantly delays development of heart failure

肥満、高血圧および糖尿病は心不全のリスクファクターとして知られている。今回初めて、45歳までにこれらのリスクファクターを発症しないことにより心不全を発症するまでの平均年数が定量化された、とのスタディ結果が第64回American College of Cardiology学会で発表された。研究者らは、計18,280人を含む過去40年間に施行された4つのスタディの蓄積データを解析した。また、約1,500の心不全症例を同定し、心不全の診断年齢と45歳時の健康状態およびリスクファクターを比較した。45歳までに肥満、高血圧および糖尿病を有していた人々は、これらのリスクファクターを45歳までに1つも有していなかった人々と比べ、平均11～13年早く心不全と診断された。リスクファクターを3つ全てではなく1つまたは2つしか有していなかった人々は、リスファクターを1つも有していなかった人々に比べ、心不全を3～11年早く発症した。心疾患治療および予防が進歩したにもかかわらず、このパターンは過去40年間にわたり収集されたデータ全体で一貫していた。

Full Text

Obesity, hypertension and diabetes are known risk factors for heart failure. For the first time, scientists have quantified the average number of heart failure-free years a person gains by not developing those risk factors by age 45, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session in San Diego.

The study found that people who had obesity, hypertension and diabetes by age 45 were diagnosed with heart failure 11 to 13 years earlier, on average, than people who had none of those risk factors by age 45. People who had only one or two of the risk factors, but not all three, developed heart failure an average of three to 11 years earlier than people with none of the risk factors.

"The message from this study is that you really want to prevent or delay the onset of these risk factors for as long as possible," said Faraz Ahmad, M.D., a cardiology fellow at Northwestern University and the study's lead author. "Doing so can significantly increase the number of years you are likely to live free of heart failure."

Ahmad said the findings offer a new way for doctors to communicate with patients about the importance of avoiding key risk factors.

"In the clinic, we often give patients metrics of risk that are relative and abstract," he said. "It's a much more powerful message, when you're talking to patients in their 30s or 40s, to say that they will be able to live 11 to 13 years longer without heart failure if they can avoid developing these three risk factors now."

Ahmad added that the results could also help policymakers or public health practitioners more accurately predict the future prevalence of heart failure aging populations.

The researchers analyzed pooled data from four large studies including a total of 18,280 people conducted over the past 40 years. They identified nearly 1,500 cases of heart failure and compared the age at which patients were diagnosed with heart failure against their health status and risk factors at age 45.

In the study, people without obesity, hypertension or diabetes at age 45 who developed heart failure were diagnosed at an average age of 80 in men and 82 in women. People with all three risk factors who developed heart failure on average received their diagnosis in their late 60s or early 70s.

Despite advances in heart disease treatment and prevention, Ahmad said the pattern was consistent across data collected over the past 40 years.

"The associations between these risk factors and heart failure has been remarkably stable over time," Ahmad said. "Although the prevalence of some of these risk factors has changed, the association remains the same."

The researchers plan to further investigate the data to determine whether the use of medications to control risk factors helps to delay the onset of heart failure. They also plan to assess whether there are any differences in the risk factor associations among different racial groups.

ACC2015特集

抗うつ薬は心血管転帰を改善する (Abstract 1178-111)

抗うつ薬は中等度から重度のうつ病を有する患者の心血管リスクを低下させる

Antidepressants reduce cardiovascular risk among people with moderately to severely depressive symptoms

うつ病のスクリーニングと治療は、中等度から重度のうつ病を有する患者における心疾患リスクを低下させるのに役立つ可能性がある、との研究結果が第64回American College of Cardiology学会で発表された。研究者らは3年にわたり、26,000人超の患者のカルテおよび死亡率、ならびに冠動脈疾患および脳卒中について解析を行った。患者はうつ病スクリーニングに関する9つの質問に回答し、気分、睡眠、食欲などの要因が彼らのうつ症状の程度を測定するために評価された。中等度から重度のうつ病を有し抗うつ薬の単独投与患者は、中等度から重度のうつ病を有していたが抗うつ薬もスタチンも非投与の患者と比べ、3年間の追跡期間中の死亡、冠動脈疾患発症または脳卒中のリスクが53%低下した。中等度から重度のうつ病を有し抗うつ薬の単独投与患者はまた、スタチン単独またはスタチンと抗うつ薬併用投与患者に比べ、経過がよかった。これは、様々なレベルのうつ症状を有する患者を対象に抗うつ薬とコレステロール低下薬併用による相対的効果を評価した、初めてのスタディである。

Full Text

A new study found that screening for and treating depression could help to reduce the risk of heart disease in patients with moderate to severe depression.

Researchers at the Intermountain Medical Center Heart Institute in Salt Lake City analyzed the health records and rates of death, coronary artery disease and stroke of more than 26,000 patients treated in the statewide network of health centers over a three-year period. Patients completed a nine-question depression-screening questionnaire, which assessed such factors as mood, sleep and appetite, to determine their level of depressive symptoms. Based on the questionnaires, researchers identified 5,311 patients as having moderate to severe depression and 21,517 patients as having no to mild depression.

The study, which was presented March 15 at the American College of Cardiology's 64th Annual Scientific Session in San Diego, found patients with moderate to severe depression who took antidepressants alone had a lower risk of death, coronary artery disease and stroke than patients with moderate to severe depression who did not take antidepressant or statin medications. Taking statins alone or in combination with antidepressants was not associated with a significant risk reduction in this group of patients.

"What I take away from this study is that screening and treatment of depressive symptoms should be a high priority," said Heidi May, Ph.D., M.S.P.H., a cardiovascular epidemiologist at the Intermountain Medical Center Heart Institute, Salt Lake City, and the study's lead author. "Antidepressants were not associated with a reduced cardiovascular risk in people with little or no depression, but in moderately to severely depressed people, antidepressants were shown to significantly improve cardiovascular outcomes."

Depression is a known risk factor for cardiovascular disease. Previous studies assessing the impact of antidepressants on this risk have had mixed results, with some suggesting antidepressants have a positive effect and others suggesting a negative effect. This is the first study to assess the relative effects of the simultaneous use of antidepressants and cholesterol-lowering drugs among patients with varying levels of depressive symptoms.

Patients with moderate to severe depression who were taking antidepressants alone had a 53 percent lower risk of dying, developing coronary artery disease or having a stroke during the three-year follow-up period as compared to patients with moderate to severe depression who were not taking antidepressants or statins. Moderately to severely depressed patients taking antidepressants alone appeared to also fare better than those taking statins alone or a combination of statins and antidepressants, although these relationships were not directly analyzed.

"We thought we'd see an additive effect—that taking both medications would lower the risk more than either drug alone—but we found that in the more depressed people, the antidepressant really was what made the biggest difference," May said. "Focus is usually placed more on traditional cardiovascular risk factors and unfortunately, depression is often overlooked. This study adds to the evidence that, when used properly, antidepressants can improve cardiovascular outcomes among those with depressive symptoms."

The researchers excluded from the analysis patients with known cardiovascular disease such as heart failure, coronary artery disease, or a previous heart attack or stroke. They also excluded those who were already taking antidepressants when they completed the questionnaire.

Although the study did not directly investigate how antidepressants might improve cardiovascular health, May said the link could be related to behavioral changes.

"Antidepressants might have relevant physiological benefits, but I also think that improving a person's mood can contribute to a cascade of behavioral changes that improve cardiovascular health," May said. "For example, people who are having depressive symptoms may not be as inclined to exercise, practice good health habits or comply with health advice. Using an antidepressant to reduce depressive symptoms might also help people better take care of their heart health."

The analysis accounted for standard cardiovascular risk factors such as diabetes, smoking and hypertension. However, because the study only included information that was available in patients' health records, the researchers were unable to account for other factors such as level of physical activity, changes in habits or non-drug mental health treatment such as psychotherapy. May said future studies could help to further refine understanding of the relationships between depression, antidepressants and cardiovascular health.

Findings from another study presented at ACC.15 also add to the evidence that depression may influence cardiovascular outcomes, prompting authors to call on cardiologists to pay closer attention to depression when managing patients with heart disease.

Researchers at Care Institute of Medical Sciences in India found depression to be independently associated with a greater chance of cardiovascular death and lower quality of life (e.g., overall well-being, emotional stability, physical activity). In fact, depressed patients had nearly double the risk of dying over the three-year study period compared with those who are not depressed. Being readmitted to the hospital or needing repeated angioplasty to open blocked arteries was unaffected by depression status. All told, 40 percent of 1,648 subjects studied had depression.

Keyur Parikh, M.D., and his colleagues say this study, while limited to India, is among the first to examine the relationship between depression and hospitalization, revascularization and death. Based on the results, clinicians have introduced yoga and cognitive behavioral therapy into ongoing cardiac rehab programs and plan to evaluate whether this might improve outcomes.

ACC2015特集

PCSK9阻害薬の長期的有効性 (Abstract 402-08)

新たなクラスのコレステロール低下薬は1年間の心血管イベントを劇的に減少させた

New class of cholesterol-lowering medications dramatically reduces cardiovascular events at one year

Evolocumab—LDLコレステロールを劇的に低下させることがこれまでに示された治験薬—を内服した患者は、標準治療を受けた患者に比べ、死亡、心筋梗塞または脳卒中発症、入院または血管形成術を必要とする確率が半分に減少したとの研究結果が、第64回American College of Cardiology年次集会で発表され同時に*New England Journal of Medicine*オンライン版に掲載された。Evolocumabは、血中からLDLコレステロールを除去する肝臓の機能を低下させる蛋白である、前駆蛋白質転換酵素サブチリシン／ケキシン9型（PCSK9）を阻害することにより作用するヒトモノクローナル抗体である。研究者らは、この薬剤のLDL低下能を評価したトライアル終了にあたり、さらに今回の1年延長トライアルに参加した患者4,465人を調査した。このオープンラベルスタディにおいて、そのほとんどが中・高程度の強化スタチン療法を施行された標準治療群における心血管イベントは2.18%であった。一方、evolocumabで治療された患者における1年間のイベント率は0.95%であった。Evolocumab群における心血管イベントの53%低下は、複合エンドポイントに含まれた各主要心血管イベントにおいて、また患者サブグループに関係なく一貫していた。

Full Text

Patients taking evolocumab—an investigational therapy previously shown to dramatically lower LDL cholesterol—were half as likely to die, suffer a myocardial infarction or stroke, be hospitalized or need angioplasty compared with those who received standard care, according to research presented at the American College of Cardiology's 64th Annual Scientific Session and simultaneously published online in the *New England Journal of Medicine* in San Diego.

In this open-label study, the rate of cardiovascular events was 2.18 percent after one year in the standard of care group, most of whom were on moderate or high intensity statin therapy. In contrast, patients treated with evolocumab had approximately half the risk or a 0.95 percent event rate after one year.

Evolocumab reduced LDL cholesterol by 61 percent in previous trials. Evolocumab is a human monoclonal antibody that works by blocking proprotein convertase subtilisin-kexin 9 (PCSK9), a protein that reduces the liver's ability to remove LDL cholesterol from the blood.

"The reduction in LDL was profound and that may be why we saw a marked reduction in cardiovascular events so quickly," said Marc Sabatine, M.D., chairman of the TIMI Study Group and a senior physician in the Division of Cardiovascular Medicine at Brigham and Women's Hospital in Boston, and the study's lead author. "It suggests that if we can drive a patient's LDL cholesterol down a large amount to a very low level, we may start to see a benefit sooner than would be expected with a more modest intervention."

At the start of the study, the average LDL cholesterol measure was 120 milligrams per deciliter. Patients receiving evolocumab were able to achieve an absolute reduction of more than 70 milligrams per deciliter reaching 48 milligrams per deciliter on average. Sabatine said this achieved level of LDL cholesterol is much lower than that achieved in the treatment arm of most other trials.

Researchers studied a total of 4,465 patients who, upon completing one of 12 phase II or III trials that evaluated the drug's ability to lower LDL cholesterol, subsequently enrolled in this one-year extension study to investigate the therapy's effect on long-term safety, LDL-lowering and cardiovascular outcomes. Researchers re-randomized patients 2:1 to receive evolocumab injected under the skin either every two or four weeks plus standard care, or standard care alone, which consisted of the lipid-lowering therapy recommended by their treating physician, usually moderate or high-intensity statin therapy. A central committee that was blinded to the treatment groups then reviewed the data and reported the number of deaths, major coronary events, myocardial infarction, stroke, unstable angina requiring hospitalization and coronary revascularization.

The 53 percent reduction in cardiovascular events in the evolocumab group was consistent across each of the major cardiovascular events included in the composite endpoint—death, heart attack, stroke, hospitalization and angioplasty—and among patient subgroups; no differences were found based on age, baseline LDL levels, statin use, primary or secondary prevention or whether they had valve disease.

Adverse events were largely balanced between the two-week and four-week treatment arms and evolocumab was well tolerated.

Still, the results are limited by the nature of the trial, in which there were relatively few cardiovascular outcomes (only 60). An ongoing, highly anticipated trial of 27,500 patients to investigate evolocumab's effect on cardiovascular outcomes is underway; however, data are not expected until 2017.

"We won't have any definitive answers until this larger trial we are doing is complete, but these data now give us a sense for the potential clinical benefit of these drugs," Sabatine said. "We know from previous research that evolocumab lowers LDL cholesterol, but these data offer support for their potential to reduce major adverse cardiovascular events in our patients."

The drug makes sense biologically too, he said. "Patients who genetically have lower levels of PCSK9 activity also have a lower rate of adverse cardiovascular outcomes. Now in our analyses, we see this PCSK9 inhibitor appears to reduce adverse cardiovascular outcomes."

He said the findings are especially good news for patients who, despite taking a statin, are not able to lower LDL cholesterol enough or who cannot tolerate statins for a variety of reasons. Evolocumab is one of three PCSK9 inhibitors being studied in large clinical trials.

This study was funded by Amgen, the manufacturer of the drug.

ACC2015特集

2剤併用抗血小板療法を1年以上行うことの有効性 (Abstract 400-18)

PEGASUS-TIMI 54：長期ticagrelor投与は心筋梗塞後のイベントを軽減する

PEGASUS-TIMI 54: Long-term ticagrelor cuts risk of future events after myocardial infarction

心筋梗塞（MI）後の長期治療として抗血小板薬ticagrelorをアスピリンと併用することでその後の心血管疾患死亡率は有意に低下し、この有効性は約3年続くようである、と第64回American College of Cardiology年次集会で発表され、同時に*New England Journal of Medicine*オンライン版に掲載された。二重盲検PEGASUS-TIMI 54トライアルは、過去1～3年間のMI既往患者21,162人を組み入れた。それぞれの患者が、年齢や糖尿病などのMI再発リスクファクターを他にも有していた。31か国1,144施設のこれらの患者が、ticagrelor 90mg、ticagrelor 60mgまたはプラセボの1日2回投与群にランダムに割り付けられた。Ticagrelorの両方の用量群もスタディの一次エンドポイントである心血管死（MIまたは脳卒中）の確率を減少させ、プラセボ群に対し90mgでは15%の減少、60mg群では16%の減少であった。Ticagrelor投与中止につながる出血は治験薬群の7%に発現し、また治験薬投与中止につながる呼吸困難は5%に発現した。

Full Text

Adding the antiplatelet drug ticagrelor to aspirin as long-term therapy after a myocardial infarction significantly reduced the rate of subsequent death from cardiovascular causes, myocardial infarction (MI) or stroke, with the benefit appearing to accrue for nearly three years, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session.

The double blind PEGASUS-TIMI 54 trial recruited 21,162 patients who had experienced a myocardial infarction in the previous one to three years. Each had another factor, such as age or diabetes that put them at risk for a second heart attack. The patients, from 1,144 sites in 31 countries, were randomly assigned to a twice-daily regimen of ticagrelor at 90 mg, ticagrelor at 60 mg or placebo.

Both ticagrelor doses reduced the chances of cardiovascular death, heart attack or stroke, the study's primary endpoint, with a 15 percent reduction in the 90-mg group and a 16 percent reduction in the 60-mg group compared to the placebo group.

"The benefit we saw was remarkably consistent across the individual components of the endpoint and in all the major subgroups of patients," said Marc S. Sabatine, M.D., M.P.H., chair of the TIMI Study Group, a senior physician in the Cardiovascular Division at Brigham and Women's Hospital and Harvard Medical School in Boston, and the study's principal investigator. "Moreover, we followed patients for an average of just under three years, and our event curves continue to spread out over time, suggesting that the benefit continues to accrue over time."

After a myocardial infarction, standard practice calls for putting patients on a lifetime regimen of daily aspirin to reduce the chance of another MI. Previous studies have shown a benefit in adding a second antiplatelet drug like ticagrelor, from a class called P2Y12 inhibitors, but they investigated the additional therapy for only a year, leaving unanswered the question of whether patients would benefit from continuing this treatment longer.

The twice-daily 90-mg dose of ticagrelor is already approved for patients with acute coronary syndrome. Researchers included a lower dose in this study, to study whether platelet inhibition needed two years after a myocardial infarction might be different from what is needed two hours after a myocardial infarction. Findings from a pharmacokinetic and pharmacodynamic substudy comparing the two dose levels will be presented at a later date.

With blood thinners such as ticagrelor, bleeding is the major side effect, and excess bleeding was seen in both treatment arms, though bleeding into the brain and fatal bleeding were not more common with ticagrelor, Sabatine said. Dyspnea was more common with ticagrelor than placebo. Bleeding led to discontinuation of ticagrelor in about 7 percent of patients on the study drug, and dyspnea led to discontinuation of the study drug in about 5 percent of patients on the drug.

"Efficacy was virtually identical with both ticagrelor doses," Sabatine said. "Risk of bleeding and dyspnea tended to be, as predicted, a bit more with the 90-mg than the 60-mg dose, but the trial wasn't designed to compare those two dose levels."

"Now that we have the evidence, when faced with a patient who has had a myocardial infarction, based on these data, I would continue treatment with ticagrelor as long as the patient tolerated it," Sabatine said.

AstraZeneca sponsored the trial and provided a grant to Brigham and Women's Hospital. Sabatine has received honoraria from the company.

ACC2015特集

CTAと機能的検査による転帰は同等である (Abstract 400-16)

PROMISE：冠動脈CT造影はハードエンドポイントを軽減させないがより良いケア計画を促進させる

PROMISE: CT angiography does not reduce hard clinical endpoints but promotes better care planning

心疾患症状を有する患者に機能的負荷試験や冠動脈CT検査を施行しても死亡や主要な心疾患の転帰の点では同等であるが、心疾患のない患者に対しさらに検査や処置を行う必要性を除外するにはCT検査の方が優れているようであるとの研究結果が第64回American College of Cardiology年次集会で発表され、*New England Journal of Medicine*に掲載された。PROMISEトライアルは、過去に冠動脈疾患の診断を受けたことはないが医師が心疾患を疑うような新たな症状を有する計10,003人の患者を対象とした。半数は冠動脈CT造影（CTA）検査を受ける群にランダムに割り付けられた。その他の患者は機能的検査（運動負荷心電図、負荷心エコー検査または負荷核医学検査のいずれか）を受けた。スタディの一次エンドポイントである死亡、心筋梗塞、重大な施術合併症または胸痛による入院の合計に関して群間差はなかった。しかし、被曝量や有意な心疾患を示さなかったその後の検査の施行率などのいくつかの二次エンドポイントにおいては、CTAの方が好ましい結果であった。

Full Text

Patients with symptoms of heart disease have similar outcomes in terms of death and major cardiac conditions regardless of whether they undergo a functional stress test or a computed tomographic scan, but the scan may be better at ruling out the need for subsequent tests and procedures in patients who are free of heart disease, according to research presented at the American College of Cardiology's 64th Annual Scientific Session in San Diego.

The PROMISE trial is the first-ever randomized controlled trial to compare clinical outcomes in patients receiving functional stress testing or computed tomographic angiography (CTA) to check for signs of cardiovascular disease. It also provides the first data to inform clinical guidelines on the use of these tests, according to the authors.

The study included a total of 10,003 patients who visited 193 health centers in the United States and Canada. Participants had no prior diagnosis of coronary artery disease but had new symptoms that made physicians suspect they might have heart disease. Nearly all had at least one cardiovascular risk factor such as high blood pressure, diabetes or a history of smoking.

Half were randomly selected to receive a heart CT scan. The rest received a functional test—either an exercise electrocardiogram, stress echocardiography or nuclear stress test. All of these tests have been in common use for a decade or more but functional tests and CTA have never before been compared head-to-head in terms of clinical outcomes.

The study showed no differences between patients receiving a CTA and those receiving functional heart tests in terms of the study's primary endpoint, a composite rate of death, heart attack, major procedural complications or hospitalization for chest pain. At least one of these outcomes occurred in roughly 3 percent of patients in both groups during more than two years of follow-up.

However, some secondary endpoints, including the level of radiation exposure and the rate of subsequent procedures that did not reveal significant heart disease, favored computed tomographic angiography.

Authors said these results are important because current clinical guidelines leave the selection of tests for patients reporting symptoms such as chest pain or shortness of breath largely up to physician and patient preference.

"Until this study, we have essentially been guessing on decisions about which initial test to use for this huge population of patients who need evaluation for cardiovascular symptoms," said Pamela Douglas, M.D., the Ursula Geller Professorship for Research in Cardiovascular Diseases at Duke University and the study's lead author. "Our study shows that the prognostic outcomes are excellent and are similar regardless of what type of test you use, but there are some indications that computed tomographic angiography might be the safer test with fewer catheterizations without obstructive disease and lower radiation exposure when compared to nuclear testing."

A key strength of the study is that it offers a reflection of current medical practice, rather than an idealized view.

"Unlike most trials where medical care is very tightly controlled, this study was designed to represent real world care," Douglas said. "The health centers that collected the data were responsible for interpreting the tests and doing appropriate patient follow-up."

The 3 percent rate of death, myocardial infarction, major procedural complications or hospitalization for chest pain seen in both groups was lower than expected, especially considering the fact that most study participants had two or more significant heart disease risk factors, were middle aged or older and symptomatic. The relative benefit of CTA compared to functional testing held steady across different patient subgroups as defined by age, gender, race and cardiovascular risk factors. Although there was a significantly lower rate of death and non-fatal MI after one year of follow-up in patients receiving a heart CT scan, for reasons that are unclear, this difference was not sustained in the second year, study authors said.

"The event rate in itself is intriguing, because no previous studies have closely tracked and adjudicated the rate of adverse events in this patient population," Douglas said. "These outcomes are so good given widespread use of medications like statins and aspirin. It does raise the question of whether we can identify a group of people who actually do not need to be tested."

After their initial non-invasive test, about 10 percent of study participants underwent at least one cardiac catheterization procedure. The rates of patients undergoing catheterization that failed to identify substantial narrowing were significantly higher in the patients receiving functional testing, at 4.3 percent, compared to 3.4 percent in the patients who had received a CT scan.

In addition, at three months patients receiving heart scans received significantly lower radiation exposure than patients who were given a nuclear stress test as their first diagnostic test.

Douglas said the bottom line for patients is that if the primary concern is avoiding serious adverse heart problems such as death, heart attack or hospitalization, heart CT scans and functional tests are both excellent options. For lower-priority concerns such as avoiding subsequent tests and procedures or avoiding radiation exposure, CTA appears to be a slightly better option.

Douglas said the team plans to further investigate outcomes for different subgroups of patients to determine whether different groups might benefit from different testing approaches.

The research team also analyzed the financial implications of the data in terms of medical costs and reimbursements, which will be presented separately.

The study was funded by the National Heart, Lung, and Blood Institute of the National Institutes of Health.

ACC2015特集

冠動脈CT造影は診断を向上させる (Abstract 402-14)

SCOT-HEART：冠動脈CT造影はより優れたケア計画を促進し後の心筋梗塞リスクを軽減する可能性がある

SCOT-HEART: CT angiography promotes better care planning and may reduce risk for future myocardial infarction

冠動脈CT造影（CTA）の使用と標準的な治療を組み合わせることにより胸痛で来院した患者を医師がより正確に診断でき、より適切な追跡検査や治療につながるとの研究結果が第64回American College of Cardiology年次集会で発表され、*Lancet*に掲載された。冠動脈疾患（CAD）が疑われる胸痛により来院した計4,146人の患者がスタディの対象となった。CAD、CADによる狭心症疑い、または心疾患ではないとの初回診断の後、4,146人の患者全員が標準治療のみまたはCTAを組み合わせて施行される群に等しくランダムに割り付けられた。CTA群の25%がこの検査後に異なる診断を下されたのに対し、標準ケア群におけるその割合はわずか1%であった。その後の検査計画はCTA群の15%で変更になったのに対し、コントロール群におけるその割合はわずか1%であった。CTAを受けた患者の約23%が新たな診断に応じて治療が変更されたのに対し、コントロール群においてはわずか5%変更されたのみであった。CTA群における心筋梗塞発現率は低い傾向にあった。

Full Text

Use of computed tomography coronary angiography (CTA), coupled with standard care allows doctors to more accurately diagnose coronary artery disease in patients presenting with chest pain, therefore, leading to more appropriate follow-up testing and treatments, according to research presented at the American College of Cardiology's 64th Annual Scientific Session. Data also showed a trend toward a lower incidence of heart attacks among the group receiving CTA compared to usual care.

Many people presenting with angina end up suffering a cardiac event within a couple of years and need timely intervention. At the same time, misdiagnoses of non-cardiac chest pain also leave one-third of patients vulnerable to subsequent death from cardiovascular disease, so methods to improve the initial diagnoses and treatments are critical, the authors said.

A total of 4,146 patients at 12 cardiology centers across Scotland who presented to the clinic with chest pain due to suspected coronary artery disease were included in the study. Forty-seven percent were given an initial diagnosis of coronary artery disease using standard protocols and 36 percent were given an initial diagnosis of suspected angina due to coronary artery disease. The remainder were not diagnosed with heart disease and likely had conditions such as indigestion or muscular pain. After this initial visit, all 4,146 patients were then equally randomized to receive standard care—a cardiologist consultation and exercise stress test—alone or in combination with CTA. Patients receiving CTA were much more likely to be given a different diagnosis. All told, 25 percent of these patients were given a different diagnosis after receiving this test compared to just 1 percent of patients who received standard care alone.

The clarification of diagnoses resulted in two significant secondary endpoint measures. Plans for subsequent testing were altered in 15 percent of patients receiving CTA compared with just 1 percent of patients in the control group. About 23 percent of patients receiving the CT scan had a change in treatment to correspond with the new diagnosis versus only 5 percent in the control group. There was no difference between the groups in either symptom severity at six weeks or subsequent hospitalizations.

"There have been studies showing that CT coronary angiograms can accurately detect coronary artery disease, but we wanted to move beyond that and ask whether this test is clinically relevant; that is, does it change the patient's care and outcome?" said David E. Newby, M.D., Ph.D., British Heart Foundation professor at University of Edinburgh, and chief investigator of the SCOT-HEART trial. "What was very clear from the findings is it can help guide which test to do next, which procedures or drugs to give and ultimately help prevent heart attacks."

Newby was surprised that after just 20 months of follow-up, there appeared to be a 38 percent reduction in the number of myocardial infarctions (MI) in patients who received a CT scan compared with the control group (26 versus 42, respectively), suggesting that clarification of diagnosis and treatment plans may lower the risk of future MIs. However, the rate of MI in both groups was low and failed to reach statistical significance. Researchers caution that further follow-up data are needed before any definitive conclusions can be drawn regarding the effect of CT scans on cardiovascular outcomes. Still, they said the data suggest that CT scans significantly clarify the diagnosis and lead to more timely focused treatments, which may in turn affect cardiovascular outcomes.

Interestingly, while the use of CT scans appeared to boost the certainty of the diagnosis of angina due to coronary artery disease, the overall frequency of this diagnosis was reduced. Newby explained this occurred because they identified more incorrect diagnoses of angina due to coronary artery disease than previously unrecognized cases of this condition.

"This means we were able to stop unnecessary treatments in the former, which are often given over a lifetime and start new treatments in those now correctly diagnosed with coronary artery disease to prevent future problems; hence the apparent reductions in heart attack," he said.

"The message to cardiologists is, if you see a patient in the clinic and you think there is any chance they have coronary artery disease, consider doing a CT scan," Newby said. "It gives you a very clear answer, and it will help manage the patients."

The study was funded by Chief Scientist Office in Scotland, with supplementary grant awards from Edinburgh and Lothian's Health Foundation Trust and the Heart Diseases Research Fund.

This study was simultaneously published online in the *Lancet* at the time of presentation.

ACC2015特集

CoreValveの2年間の優位性が確認された (Abstract 404-12)

CoreValve：高リスク患者において自己拡張型TAVRは延命効果が2年間にわたり手術よりも優れていた

CoreValve: Self-expanding TAVR widens survival advantage over surgery at two years in high-risk patients

2年間のデータから、重度の大動脈弁狭窄を有する高リスク患者において自己拡張型経カテーテル大動脈弁置換術（TAVR）は標準的な手術よりも延命効果に優れていたことが示された、との研究結果が第64回American College of Cardiology年次集会で発表された。CoreValve U.S. Pivotal High Risk Trialにおいて、開心弁置換術によるリスクの高い患者がTAVRまたは標準的な手術を施行される群にランダムに割り付けられた。1年後の死亡率は、TAVR群390人において開心術を受けた357人よりも有意に低かった。TAVRにおける延命効果は2年後に増大していることが明らかにされた—2群間の総死亡率の絶対差は拡大し、生存患者は1年後の時点ではTAVR群において手術群より4.8%多く、2年後にはTAVR群患者の方が手術群患者よりも6.4%多かった。自己拡張型デバイスはまた、他のエンドポイント発現率も低かった。脳卒中発現率はTAVR患者における10.9%に対し手術群では16.6%であり、重大な心血管または脳血管イベント発現率はTAVR群の29.7%に対し手術群では38.6%であった。

Full Text

Two-year data show a continued survival advantage for self-expanding transcatheter aortic valve replacement (TAVR) over standard surgery in high-risk patients with severe aortic stenosis, according to research presented at the American College of Cardiology's 64th Annual Scientific Session.

In the CoreValve U.S. Pivotal High Risk Trial, patients with a heightened risk of death from open-heart valve replacement were randomly assigned to TAVR or the standard surgical procedure. Death rates at one year were significantly lower for the 390 TAVR patients than for the 357 patients who had open-heart surgery. Year two data include three more patients, two of whom received a smaller second-generation CoreValve that wasn't available earlier.

"Survival is statistically better with TAVR and sustained at two years," said Michael J. Reardon, M.D., professor and Allison Family Chair of Cardiovascular Research at Houston Methodist Hospital and the study's lead author. "We found that the survival advantage actually increases for TAVR—that the absolute difference in all-cause death rates between the two groups has widened, with 4.8 percent more people surviving with TAVR than surgery at one year and 6.4 percent more surviving with TAVR at two years."

The self-expanding device also had significantly lower rates for other endpoints. The rate of strokes was 10.9 percent for TAVR patients and 16.6 percent for surgery patients, and 29.7 percent of TAVR patients had a major adverse cardiovascular or cerebrovascular event compared with 38.6 percent of surgery patients. Results favored TAVR across all subgroups analyzed.

"Durability is an issue, and we saw no evidence of TAVR valve deterioration," Reardon said. "Effective valve orifice and mean pressure gradients [measures of valve quality] were statistically superior with TAVR at every time point during the trial."

Leaking around the new valve is one area where surgery consistently performs better than TAVR in clinical trials.

"Moderate to severe paravalvular leakage with TAVR was low at one year at 6 percent and stayed low at two years at 6.1 percent," Reardon said, noting that, unlike some other TAVR studies, leaks haven't had an impact on mortality with this valve. "We had very few cases of moderate or more leaks, and this may be why we don't see a mortality signal with leakage."

With these latest findings, Reardon sees reason to revisit current guidelines.
"This trial moves the field forward in that ACC/AHA guidelines state that TAVR is a reasonable alternative to surgical valve replacement in high-risk patients, as judged appropriate by the heart team," he said. "This trial's data suggest that TAVR with the self-expanding valve should be the preferred treatment in patients with symptomatic severe aortic stenosis at increased risk from surgery."

Acknowledging that these are early findings, he said that longer follow-up is needed to confirm that this valve continues to demonstrate benefits over surgery. The CoreValve High Risk trial will follow patients for five years.

This clinical trial was funded by Medtronic, Inc. Reardon serves on Medtronic's advisory board but receives no personal funding from the company.

ACC2015特集

TAVRとともに用いられるfirst-in-field脳フィルターの有益性が認められた (Abstract 404-16)

DEFLECT Ⅲ：弁置換術の際に遊離する粒子を防御するデバイスが予後を改善した

DEFLECT III: Device that deflects particles dislodged during valve replacement improves outcomes

経カテーテル大動脈弁置換術（TAVR）中の組織砕片を脳から偏向させる試験的デバイスは院内安全性転帰および退院時認知スコアを改善するようであるとの小規模ランダム化スタディの予備的な結果が第64回American College of Cardiology年次集会で発表された。DEFLECT IIIトライアルにおいて調査されたデバイスTriGuardは、脳への3つの血管を一時的にメッシュフィルターで覆うことにより、有害な可能性のある組織砕片を遊離させるTAVRおよび他の施術中の脳損傷リスクを軽減させるようにデザインされた。83人の患者において計測された予備的な院内安全性および有効性が報告された。TAVR後7日間までの重大な階層的複合心血管および脳血管有害イベントとして定義した院内施術安全性に関しては、このデバイスを使用された患者では22.2%でありコントロール群では31.6%であった。総死亡率はデバイス群で2.2%であり、コントロール群では5.3%であった。脳卒中および生命の危険のあるまたは障害を残す出血の両者に関しては、デバイス群で2.2%でありコントロール群で5.3%であった。

Full Text

An investigational device that deflects debris away from the brain during transcatheter aortic valve replacement (TAVR) seems to improve in-hospital safety outcomes and cognitive scores at discharge, according to preliminary findings from a small randomized study presented at the American College of Cardiology's 64th Annual Scientific Session.

The valve replacement procedure dislodges minute particles from the clogged valve, freeing them to float through the bloodstream. Much of this debris travels "downstream" from the heart, but about a quarter of the debris moves "upstream" to the brain, where it can trigger a stroke or other damage. These microscopic scraps are a likely contributor to the high stroke rates seen up to a year after TAVR and to the high rates of subclinical brain injury—damage less severe than a stroke that can affect mental functions.

TriGuard, the device being studied in this trial, the DEFLECT III trial, was designed to reduce the risk of brain damage during TAVR and other procedures that release potentially hazardous debris by covering the three arteries that lead to the brain with a temporary mesh shield.

Preliminary data are available for 83 patients with complete in-hospital safety and efficacy measures. Thirty-day data are being gathered and are expected to be reported in May. Target enrollment for the trial is 86 patients recruited from 15 centers in Europe and Israel.

The novel device demonstrated benefit on several endpoints in this small patient population. For in-hospital procedure safety, defined as a hierarchical composite of major adverse cardiovascular and cerebrovascular events up to seven days after TAVR, the rates were 22.2 percent for patients with the device and 31.6 percent for patients in the control group.

Death rates from all causes were 2.2 percent for the device group and 5.3 percent for the control group. For both stroke and life-threatening or disabling bleeding, rates were 2.2 percent for the device group and 5.3 percent for the control group. No safety concerns were seen in two categories: rates of acute kidney injury were 2.2 percent for the device group compared with 0 for the control group—one patient vs. none; and rates of major vascular complications were 15.6 percent for the device group and 15.8 percent for the control group.

"Protecting the brain has become a priority to improve our patients' outcomes, and this is a new focus in interventional cardiology," said Alexandra J. Lansky, M.D., director of the Yale Cardiovascular Research Program, Yale School of Medicine and the study's lead author. DEFLECT III is the first multicenter randomized clinical trial of a brain-protection device.

Lansky said patients in the protected group performed better than the control on two cognitive tests, the Montreal Cognitive Assessment, which takes a broad look at all domains of neurocognition, and the Cogstate test, a computerized assessment of mental processing. Diffusion weighted MRI, used as a surrogate endpoint for subclinical brain injury, showed that fewer patients in the device group had new brain lesions and that the volume of the lesions was lower than in the control group.

Patients will be followed for 30 days, and all neurocognition and weighted imaging measures will be repeated at that point to determine whether the early benefits continue. The FDA has approved a definitive Investigational Device Exemption trial called REFLECT, which is expected to start enrollment during the second quarter of 2015.

This trial was sponsored by Keystone Heart Ltd. Lansky has a minor ownership in the company.

ACC2015特集

冠動脈造影の穿刺部位に関して腕は鼠径部よりも安全である (Abstract 410-10)

急性冠症候群患者におけるほとんどのカテーテル治療において経橈骨動脈アプローチの方が安全である

Transradial approach safer for most catheter-based procedures in patients with acute coronary syndrome

急性冠症候群（ACS）患者に対し冠動脈造影を施行する際、術者の循環器医が鼠径部からではなく橈骨動脈からのアプローチを行った方が大出血や死亡のリスクが有意に低かったとの研究結果が、第64回American College of Cardiology年次集会において発表され*Lancet*に掲載された。このスタディはACS患者8,400人以上を腕または鼠径部穿刺により冠動脈造影を施行する群にランダムに割り付けた。2つの一次エンドポイントの1つ目である30日間の死亡、心筋梗塞（MI）または脳卒中の合計発症率に有意差はなかった。2つ目の一次エンドポイント（上記イベントと大出血）リスクは、橈骨動脈アプローチの方が有意に低かった。30日間の重大な出血、死亡、MIまたは脳卒中は経橈骨動脈アプローチ患者で9.8%であったのに対し、経大腿動脈アプローチ患者では11.7%であった。これらの差は、経橈骨動脈アプローチ患者の1.6%および経大腿動脈アプローチ患者の2.3%に発現した大出血、さらに経橈骨動脈アプローチ患者の1.6%および経大腿動脈アプローチ患者の2.2%に見られた死亡に大きく依存している。筆者らは、臨床ガイドラインの再評価および多くの心臓カテーテル施術において経橈骨動脈アプローチの推奨を提案している。

Full Text

Patients with acute coronary syndrome undergoing a coronary angiogram had a significantly lower risk of major bleeding and death if their interventional cardiologist accessed the heart using a transradial rather than transfemoral approach, according to research presented at the American College of Cardiology's 64th Annual Scientific Session and simultaneously published online in The *Lancet*. Study authors said the results should prompt a re-evaluation of clinical guidelines and that the arm should be the preferred approach for most catheter-based heart procedures.

The study did not show a significant reduction in one of its two primary endpoints, a composite rate of death, myocardial infarction (MI) or stroke 30 days after a catheterization procedure. However, the second primary endpoint, which included those events plus major bleeding, showed a significant reduced risk in patients randomized to the radial approach, rather than the femoral approach. In addition, patients receiving a catheter via the groin faced a significantly higher risk of death, which was driven by increased bleeding complications in these patients, the study authors said.

"I believe the evidence from our study should compel a switch to the radial approach as the preferred method," said Marco Valgimigli, M.D., Ph.D., associate professor of cardiology and senior interventional cardiologist at the Erasmus University Medical Center in the Netherlands and the study's lead author. "I hope that a new generation of interventional cardiologists will be specifically trained in the radial approach and that more medical centers will build up their expertise in this procedure."

The study is the first large trial to show radial access improves patient outcomes and that it reduces dangerous bleeding beyond the bleeding that can occur near where the catheter is inserted.

"This study shows that interventional cardiologists who are experienced with the radial approach have nothing to lose and everything to gain by using the arm as the access point for these procedures," Valgimigli said. In addition to improving outcomes, the radial approach can also save on medical costs because it typically results in a quicker recovery and shorter hospital stay, Valgimigli said.

The study randomized more than 8,400 angiogram patients at 78 hospitals in four European countries to receive angiogram via the arm or the groin. All study participants had acute coronary syndrome.

Patients receiving radial access suffered major bleeding, death, MI or stroke within 30 days in 9.8 percent of cases as compared to 11.7 percent in those receiving femoral access. The difference was largely attributable to major bleeding, which occurred in 1.6 percent of patients receiving radial access and 2.3 percent of patients receiving femoral access, and death, which occurred in 1.6 percent of patients receiving radial access and 2.2 percent of patients receiving femoral access.

Study authors attributed the fact that the study did not meet its other co-primary endpoint to a higher-than-usual bar for statistical significance, a result of the inclusion of two co-primary endpoints in the study rather than only one. The study found no differences with respect to rates of MI or stroke.

Interventional cardiologists have typically favored catheter access through the groin because it involves a larger artery that is less prone to spasm, an event that can limit the ability to move medical equipment through the catheter. Although the artery in the arm is closer to the surface and thus easier to access, the artery's smaller size makes the radial approach more technically difficult and requires the use of smaller equipment.

Because the radial approach is more difficult to perform, the study showed the hospital's level of experience with this method had a substantial impact on patient outcomes. To build the level of experience necessary to maximize the benefits of the radial approach, a given surgeon should use the radial approach in at least 80 percent of cases, Valgimigli said. However, the femoral approach is still appropriate for certain types of procedures that require the use of larger equipment, such as transcatheter aortic valve implantation (TAVI).

The study, called the Minimizing Adverse Hemorrhagic Events by Transradial Access Site and Systemic Implementation of AngioX Program (MATRIX), also tested the effects of the anticoagulant drug bivalirudin. Those results are being reported separately.

The study was funded by the Gruppo Italiano Studi Emodinamica (Italian Society of Interventional Cardiology), which received research grants from the Medicines Company, the maker of Bivalirudin, and the medical device company Terumo. The study was designed and conducted by Valgimigli and co-investigators.

ACC2015特集

バイパス手術は新世代ステントよりも成績が良好である (Abstract 408-14)

BEST：多枝冠動脈疾患治療において冠動脈バイパス術は依然として最良の治療選択肢である

BEST: Coronary artery bypass graft surgery still best option for treating multivessel coronary artery disease

新世代ステントの出現にもかかわらず、多枝冠動脈疾患に対して冠動脈バイパス術を施行された患者はバルーン血管形成およびステント留置により狭窄解除された患者よりも経過が良好であるとのスタディ結果が、第64回American College of Cardiology年次集会で発表され、*New England Journal of Medicine*オンライン版に掲載された。Bypass Surgery Versus Everolimus-Eluting Stent Implantation for Multivessel Coronary Artery Disease（BEST）トライアルと呼ばれるこのスタディは、4か国27施設で治療を受けた患者880人を対象とした。患者の半数はエベロリムス溶出ステントを用いた血管形成術群、残りの半数はバイパス術群にランダムに割り付けられた。患者は平均4.5年以上追跡された。新たな薬剤溶出ステントを用いて血管形成術を施行された患者は、バイパス術を施行された患者に比べ、スタディにおいてエンドポイントとされた転帰（死亡、心筋梗塞および血行再建術の再施行）のうちの1つのリスクが47%高かった。血管形成術は医用画像処理血管造影によるガイド下で施行された。バイパス術と冠血流予備量比を用いた血管形成術による転帰を比較した新たなスタディが現在進行中である。

Full Text

Despite the advent of a new generation of stents, patients with multivessel coronary artery disease who received coronary artery bypass grafting fared better than those whose arteries were opened with balloon angioplasty and stents in a study presented at the American College of Cardiology's 64th Annual Scientific Session and simultaneously published online in the *New England Journal of Medicine*.

The findings echo past studies, which have shown patients with multiple narrowed arteries have better outcomes with coronary artery bypass grafting (CABG) than with angioplasty.

In the new study, patients receiving angioplasty with the new stents had a 47 percent higher risk of one of the outcomes identified as a primary endpoint in the study: death, heart attack and subsequent procedure to clear blocked arteries, as compared to patients who received bypass. The study reinforces current guidelines, which recommend bypass surgery for treating patients with substantial narrowing in multiple arteries.

"Based on our data, CABG is still the preferred option for multivessel disease," said Seung-Jung Park, M.D., a cardiologist at Asan Medical Center in Seoul, South Korea, and the study's lead author. "We had thought that previous trials may have been limited by their use of first-generation drug-eluting stents, but these results show CABG still leads to better outcomes."

The study, called the Bypass Surgery Versus Everolimus-Eluting Stent Implantation for Multivessel Coronary Artery Disease (BEST) trial, is one of only two randomized controlled trials to compare bypass to angioplasty since the introduction of everolimus-eluting stents, a new generation of drug-eluting stent. The trial's findings align with those from the previous study, called Synergy between PCI with Taxus and Cardiac Surgery (SYNTAX).

The study included 880 patients treated at 27 hospitals in four countries. All patients had multivessel coronary artery disease and were determined to be equally appropriate candidates for either angioplasty or bypass. Half of the patients were randomly assigned to receive angioplasty with everolimus-eluting stent and half received bypass surgery. Patients were tracked for an average of more than 4.5 years.

"During this relatively long-term follow-up, angioplasty was associated with a significant increase in the incidence of the death, myocardial infarction and target vessel revascularization, a difference that was mainly attributed to the higher rate of target-vessel revascularization in the angioplasty group," Park said.

Death, heart attack or a subsequent procedure to clear blocked arteries occurred in 15 percent of patients in the angioplasty group and 11 percent of patients in the bypass group. In addition, the researchers found patients receiving angioplasty were twice as likely to need repeat revascularization and more than 1.8 times as likely to have a heart attack as patients who received bypass.

The study was terminated earlier than planned, limiting its statistical power to detect differences in individual outcomes instead of only composite outcomes. The early termination was due to slow enrollment, thought to be a consequence of the rapid spread and increased appeal of a new angioplasty technique called fractional flow reserve during the later part of the study enrollment period.

The angioplasty procedures in the BEST and SYNTAX studies were guided by the medical imaging technique angiography. Fractional flow reserve, by contrast, allows surgeons to more precisely assess the condition of the arteries based on the pressure of blood as it flows through them and has been associated with better outcomes for angioplasty. A new study is currently underway to compare outcomes from bypass to angioplasty using fractional flow reserve in patients with multivessel coronary artery disease.

ACC2015特集

僧帽弁手術中のアブレーションの有益性 (Abstract 408-10)

僧帽弁手術中のアブレーションにより少なくとも1年間は心房細動発作が減少する

Ablation during mitral valve surgery reduces atrial fibrillation episodes for at least a year

僧帽弁手術施行中にアブレーションを施行された心房細動患者は、僧帽弁手術のみを施行された患者に比べその後1年間の心房細動発作が少なかったとのスタディ結果が第64回American College of Cardiology年次集会で発表され、*New England Journal of Medicine*オンライン版に掲載された。このスタディは僧帽弁手術を施行される患者260人を僧帽弁手術単独または僧帽弁手術と外科的アブレーションの両者施行群にランダムに割り付けた。スタディ参加者全員が持続性または長期持続性心房細動を有していた。アブレーションと僧帽弁手術を施行された患者のうち63%が術後6、12か月の時点で心房細動を有していなかったのに対し、僧帽弁手術のみを施行された患者のうちこれらの時点で心房細動を有していなかったのは29%であった。しかしまたこの解析から、僧帽弁手術にアブレーションを含めることによるマイナス面がある可能性も明らかになった。僧帽弁手術とともにアブレーションも施行された患者は術後1年間にペースメーカー埋め込みを必要とする確率が2.5倍高かった。この差の理由は不明であり、さらなる研究が必要である。

Full Text

Patients with atrial fibrillation who received ablation while they were already undergoing undergoing mitral valve surgery had fewer episodes of atrial fibrillation a year later compared to patients who had the valve surgery alone, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session and published online in the *New England Journal of Medicine* at the time of presentation.

The patients who received ablation along with mitral valve surgery had no more deaths, adverse cardiac events or hospitalizations than patients who only received the valve surgery alone, but they were more likely to require a pacemaker.

The study, which included 260 patients within the Cardiothoracic Surgical Trials Network, a clinical research network involving 20 U.S. and Canadian hospitals, is the first appropriately powered randomized clinical trial to assess the use of ablation in patients already undergoing mitral valve surgery. Half of the patients were randomly assigned to receive mitral valve surgery alone, while the other half also received surgical ablation. All of the study participants had persistent or long-standing persistent atrial fibrillation and were undergoing surgery to repair or replace the heart's mitral valve.

Of the patients who received ablation and mitral valve surgery, 63 percent were free from atrial fibrillation at six and 12 months after surgery, while 29 percent of patients who received mitral valve surgery alone were free from atrial fibrillation at those time points.

"Although surgeons are widely performing ablation at the time of mitral valve surgery, there is a great deal of variation with regard to when it is done, how it is done and which patients receive it," said Marc Gillinov, M.D., the Judith Dion Pyle Chair in Heart Valve Research at Cleveland Clinic and the study's lead author. "We sought to conduct a well-designed randomized controlled trial to answer fundamental questions about whether this procedure is successful and how it is best done."

In the absence of strong clinical guidance regarding the use of ablation with mitral valve surgery, the decision is left largely up to physician preference, Gillinov said. About two-thirds of surgeons currently perform ablation during mitral valve surgery for patients with persistent atrial fibrillation, while one-third do not.

While the patients receiving ablation were significantly more likely to be free of atrial fibrillation six and 12 months after surgery, the study showed no significant differences in rates of death, adverse cardiac events or hospitalization. Patients receiving the mitral valve surgery alone reported a slightly lower quality of life because more of these patients said they still experienced daily atrial fibrillation a year after the surgery.

"I think what this shows is that, in the mitral valve surgery patient who has persistent atrial fibrillation, you will achieve better rhythm control by performing ablation, without any increase in mortality or other adverse cardiac events," Gillinov said.

However, the analysis also revealed one potential downside to including ablation with mitral valve surgery. Patients receiving the ablation along with the mitral valve surgery were 2.5 times more likely to require the implantation of a pacemaker in the year following their surgery. The reason for this difference is unknown and warrants further study, Gillinov said.

Because there are several tools and techniques physicians can choose when performing surgical ablation, researchers decided to randomly assign patients receiving the ablation to either pulmonary vein isolation or a biatrial Maze lesion. The analysis showed no significant differences in the outcomes for patients undergoing the two procedure types, though a larger study would help to elucidate any differences, Gillinov said.

Because patients have only been tracked for one year, the results do not yet provide a clear picture of the full spectrum of potential differences in cardiovascular outcomes. The researchers will continue to track patients to assess any long-term differences in survival, hospitalization, stroke and other outcomes.

The National Institutes of Health and Canadian Institutes for Health Research supported the design and conduct of the trial.

ACC2015特集

心不全患者はアミオダロンよりもカテーテルアブレーションの方が経過良好である (Abstract 408-08)

ICDまたはCRT-D治療とカテーテルアブレーションの併用により心不全および心房細動を有する患者の死亡リスクが低下する

ICD or CRT-D treatment plus catheter ablation lowers risk of death in patients with heart failure and atrial fibrillation

心不全および心房細動を有しカテーテルアブレーションを施行された患者は、抗不整脈薬アミオダロンを内服した患者よりも死亡、入院または心房細動再発の確率が低かったとのスタディ結果が第64回American College of Cardiology年次集会で発表された。このスタディは心不全、心房細動を有し植込み型除細動器（ICD）または両室ペーシング機能付植込み型除細動器（CRT-D）のいずれかで治療を受けている患者200人余りを対象とした。患者はカテーテルアブレーション施行群またはアミオダロン治療群にランダムに割り付けられた。このスタディにおいて、一次エンドポイントである心房細動再発を2年間の追跡期間中に発症しなかったのはカテーテルアブレーション施行群で71%であったのに対し、アミオダロン治療群ではわずか34%であった。アブレーション施行群の31%が後に入院したのに対し、アミオダロン治療群では57%であった。スタディ期間中に死亡したのはアブレーション施行群の8%に対し、アミオダロン治療群では18%であった。アブレーション術のタイプや範囲は治療成功率に著明な影響を及ぼした。成功率が最も高かったのは他の領域（肺静脈に加え）も焼灼した症例であった。

Full Text

Among patients with heart failure and atrial fibrillation, those who underwent catheter ablation were less likely to die, be hospitalized or have recurrent atrial fibrillation than patients taking the antiarrhythmic drug amiodarone, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session.

Catheter ablation was most successful in procedures where ablation was required in other areas in addition to the pulmonary vein, researchers said.

Heart failure and atrial fibrillation often co-occur and are two of the most common heart problems in older adults. In the new study, 71 percent of patients treated with catheter ablation were free of atrial fibrillation, the study's primary endpoint, after two years of follow-up, while only 34 percent of patients who took amiodarone were free of symptoms at that point.

"Even when it is effective, Amiodarone often needs to be discontinued after a while due to serious long-term side effects," said Luigi Di Biase, M.D., Ph.D., a cardiologist and electrophysiologist at St. David's Medical Center and the Albert Einstein College of Medicine at Montefiore Hospital and the study's lead author. "Our study suggests that in patients with heart failure and atrial fibrillation, catheter ablation is an effective alternative treatment that can help patients avoid or discontinue this drug to reduce the risk of these long-term side effects."
The study included just over 200 patients treated in eight European and U.S. hospitals. All patients had heart failure, atrial fibrillation and either an implantable cardioverter defibrillator (ICD) or cardiac resynchronization therapy with defibrillator (CRT-D).

The researchers randomly assigned half of the patients to undergo catheter ablation and half were treated with Amiodarone.

In addition to having a higher rate of freedom from atrial fibrillation, participants who underwent catheter ablation also had lower rates of hospitalization and mortality during the two-year follow up. Thirty-one percent of patients receiving ablation were subsequently hospitalized compared to 57 percent of patients taking amiodarone. Eight percent of patients receiving ablation died during the course of the study compared to 18 percent of patients taking amiodarone.

Di Biase said the type and extent of the ablation procedure had a marked impact on the procedure's success rate.

"If the ablation is limited to the pulmonary vein alone, the success rate goes down—almost to the level of the amiodarone treatment," Di Biase said. "The highest success rates were for procedures in which other areas (in addition to the pulmonary vein) were ablated."

The specific areas that benefit from additional ablation depend on each patient's individual condition. In addition, many patients in the study required more than one ablation procedure to achieve freedom from atrial fibrillation.

Di Biase said another limitation of the study is that not all hospitals have the experience and equipment necessary to properly perform catheter ablation. As a result, the advantage of ablation over amiodarone might not be as dramatic outside of top-tier hospitals. Further research would help to track the procedure's effectiveness in a broader variety of circumstances.

There was no external funding for this study.

ACC2015特集

血管形成術時のルーチン血栓除去術には有益性は認められない (Abstract 410-08)

TOTAL：血管形成術時のルーチン血栓除去術に臨床的な有益性は認められず脳卒中リスクを上昇させる可能性がある

TOTAL: Routine thrombectomy during angioplasty associated with no clinical benefit and may increase risk of stroke

血管形成術を施行される患者におけるルーチン血栓除去術は、意図した有益性は得られず脳卒中リスクが上昇する可能性があるとのスタディ結果が第64回American College of Cardiology年次集会で発表され、同時に*New England Journal of Medicine*オンライン版に掲載された。重症心筋梗塞（MI）に対し血管形成術を施行された患者10,000人超を対象としたTOTALトライアルは、半数の患者を血管形成術単独群、残りの半数を血管形成術と手動による血栓除去術の両者施行群にランダムに割り付けた。6か月間の追跡期間後に、血管形成術単独群または血管形成術と血栓除去術の両者施行群では、一次エンドポイント（心血管死、MI再発、心原性ショックおよび最も重度の心不全の複合発現率）に関して差は認められなかった。また解析の結果、スタディの二次エンドポイント（一次エンドポイントとステント血栓症）においても有意差はなかった。しかし、血栓除去術施行群において脳卒中が統計学的有意に増加した。スタディにおいて施行された血栓除去術の全てがシリンジを用いて血栓を吸引する手動での血栓除去術であった。機械的血栓除去術は試されなかった。

Full Text

A technique used to clear blood clots from arteries to the heart in about 20 percent of patients undergoing angioplasty appears to increase the risk of stroke without providing the intended benefit, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session and simultaneously published online in the *New England Journal of Medicine*.

The TOTAL trial, which included more than 10,000 patients undergoing angioplasty in response to a severe myocardial infarction (MI), randomly assigned half of the patients to receive angioplasty alone and half to receive angioplasty with manual thrombectomy, in which the surgeon uses a syringe to create suction to remove clots. Mechanical thrombectomy, an approach that uses machinery to create the suction, was not tested.

After six months of follow-up, researchers found no differences between patients who received angioplasty alone versus those who also received manual thrombectomy in terms of the study's primary endpoint, a composite of the rates of cardiovascular death, subsequent heart attack, cardiogenic shock and the most severe category of heart failure.

"The message from this study is that thrombectomy should not be used as a routine strategy," said Sanjit Jolly, M.D., associate professor and interventional cardiologist at McMaster University, Hamilton, Ontario, Canada, and the study's lead author. "Given the downsides we observed, the findings suggest thrombectomy should be reserved as a bailout therapy to be used only when an initial angioplasty attempt fails to open up the artery."

In the study, bailout thrombectomy was performed in 7 percent of the patients assigned to receive angioplasty alone.

Thrombectomy is an additional technique that can be combined with angioplasty in which the cardiologist creates suction to remove blood clots from the artery. It has been thought that removing clots in this way could reduce the likelihood of subsequent heart attacks or other problems. Current guidelines leave it to physicians to decide whether to routinely perform thrombectomy during angioplasty or use it only as a backup strategy in cases where the angioplasty fails to open the blockage.

The rate of cardiovascular death, subsequent MI, cardiogenic shock and the most severe category of heart failure was 6.9 percent in the group receiving thrombectomy and 7 percent in the control group, a difference that was not statistically significant. In addition to revealing no differences in the composite primary endpoint or the individual components of this endpoint, the analysis also showed no significant differences in the study's secondary endpoint, which included the primary endpoints plus stent thrombosis, an often-fatal condition in which a clot develops in an artery that has been propped open with a stent, or the need for revascularization, a second surgery to clear or bypass the coronary artery.

The study showed a statistically significant increase in stroke in the thrombectomy group. It is possible that removing a blood clot from the heart could increase the risk that the clot will be lost during the removal process and eventually travel to the brain, causing a stroke, but this explanation would likely apply only to strokes that occur soon after the procedure, Jolly said. The relatively small number of strokes observed in the study within 30 days – 33 patients, or 0.7 percent, in the thrombectomy group and 16 patients, or 0.3 percent, in the control group – leaves open the possibility that the finding was due to chance alone.

The researchers saw no difference in outcomes based on the size of the blood clots, despite previous speculation that the procedure might be particularly beneficial in patients with larger clots.

"There are still open questions that aren't resolved by our study, and this procedure could still be beneficial for a small subset of patients," Jolly said. "Clearly, for patients who fail an initial angioplasty attempt, thrombectomy may be very important and is really the only way to open up the artery. We did not design the trial to test the effectiveness of selective or bailout thrombectomy."

Previous smaller studies have suggested benefits of routine thrombectomy or showed mixed results, but these studies involved fewer patients and some were limited to a single hospital. This study included patients from 87 hospitals and 20 countries.

"Our findings illustrate the importance of doing large trials," Jolly said. "There are many things in clinical practice that we believe are beneficial but need to be tested in large randomized trials. Only by doing this can we be certain of what helps patients and move the field forward."

ACC2015特集

減量により心房細動が大幅に減少する (Abstract 408-12)

肥満患者が持続的に減量することにより心房細動累積時間が有意に減少する

Sustained weight loss in obese patients significantly reduces the burden of atrial fibrillation

少なくとも10%減量した肥満の心房細動患者は減量しなかった患者に比べ、この一般的な心調律障害に長期にわたり患わされない確率が6倍高い可能性があるとのスタディ結果が第64回American College of Cardiology学会で発表され、*Journal of the American College of Cardiology*オンライン版に掲載された。研究者らは減量専門クリニックの患者355人を組み入れ、彼らの健康状態を毎年追跡した。スタディ開始時、参加者全員が肥満および心房細動を有していた。平均4年後、体重を10%以上減量した患者の45%および3～9%減量した患者の22%が、手術や薬物療法を使用することなく心房細動症状がない状態を達成した。減量が3%未満であった患者のうち、これらの治療をせずに無症状となった者はわずか13%であった。減量しその後再度体重が増加し、年1回の受診間の体重変動が5%を超えた患者は、このような体重変動のなかった患者に比べ心調律異常再発の確率が2倍であった。

Full Text

Obese patients with atrial fibrillation who lost at least 10 percent of their body weight were six times more likely to achieve long-term freedom from this common heart rhythm disorder compared to those who did not lose weight, according to a study presented at the American College of Cardiology's 64th Annual Scientific Session and simultaneously published online in the *Journal of the American College of Cardiology*.

The study is the first to track the long-term effects of weight loss and the degree of weight fluctuation on atrial fibrillation burden. Patients who lost more weight and maintained a more stable weight over four years showed marked reductions in atrial fibrillation burden and severity, the study's primary endpoints.

"Previous studies have shown that weight management can reduce atrial fibrillation symptoms in the short term and improve outcomes of ablation," said Rajeev Pathak, M.D., a cardiologist and electrophysiology fellow at the University of Adelaide, Adelaide, Australia and the study's lead author. "We sought to shed light on the long-term outcomes of sustained weight loss, the effects of the amount of weight lost and the impact of changes in weight over time."

"We found that sustained weight loss is achievable in obese patients and that it can significantly reduce the burden of atrial fibrillation," Pathak said. "Weight loss also led to favorable changes in cardiovascular risk factors such as high blood pressure, obstructive sleep apnea and diabetes, along with improvements in the structure and function of the heart."

Researchers enrolled 355 participants in a dedicated weight loss clinic and tracked their health annually for an average of four years. All participants were obese and had atrial fibrillation at the start of the study. To encourage weight loss, the clinic used a motivational, goal-directed approach that included three in-person visits per month, detailed dietary guidance, low-intensity exercise, support counseling and maintenance of a daily diet and physical activity diary.

Participants returned to the clinic annually for a health exam and atrial fibrillation monitoring. To assess the frequency, duration and severity of symptoms, patients completed questionnaires and wore a Holter monitor for seven days. An echocardiogram was also conducted to assess the volume of the left atrium and the thickness of the left ventricular wall.

After an average of four years, 45 percent of patients who lost 10 percent or more of their body weight and 22 percent of patients who lost 3 to 9 percent of their weight achieved freedom from atrial fibrillation symptoms without the use of any atrial fibrillation surgery or medication. Only 13 percent of patients who lost less than 3 percent of their body weight were free of symptoms without these treatments. Even with the use of surgery or medication, those who lost more weight were substantially more likely to achieve freedom from atrial fibrillation symptoms.

Sustained weight management and a linear weight loss trajectory were also associated with greater freedom from atrial fibrillation. Patients who lost and then regained weight, causing a fluctuation of more than 5 percent between annual visits, were twice as likely to have recurrent rhythm problems than those who did not experience such fluctuations.

Weight loss was also associated with significant beneficial structural changes in the heart and significantly improved other markers of heart health including blood pressure, cholesterol and blood sugar levels. In an analysis that took all of these factors into account, patients who lost at least 10 percent of their weight were six times more likely to achieve freedom from atrial fibrillation than patients who lost less than 3 percent of their weight or gained weight.

Patients with permanent atrial fibrillation, a previous ablation or a severe medical illness were excluded from participating in the study. While the researchers used standardized procedures and follow up to reduce bias in the patient selection and evaluation process, all patients voluntarily opted to participate in the weight loss program and this may contribute to some level of bias, Pathak said. Future studies that involve a more diverse patient population could help to further refine understanding of the relationships between obesity and atrial fibrillation.

ACC2015特集

STEMI既往者に対し完全血管形成術は安全である (Abstract 410-14)

STEMI既往者に対する積極的なフォローアップ施術により将来のインターベンションの必要性が軽減する可能性がある

Proactive follow-up procedure in STEMI survivors may reduce need for future intervention

ST上昇心筋梗塞（STEMI）の既往を有し複数の冠動脈に狭窄を有する患者は完全血行再建を受けることにより恩恵を被り、将来の血管形成術の必要性が軽減する可能性があるとの研究結果が、第64回American College of Cardiology年次集会で発表された。初回血管形成術後生存したSTEMI患者計627人が、標準的なフォローアップ治療または緊急処置2日後に完全血行再建を施行される群にランダムに割り付けられた。患者は50%以上の狭窄および冠血流予備量比0.80未満を伴う多枝病変を有していた。平均27か月後に、標準治療を受けた患者の17%が予定外の血管形成術またはバイパス手術のために再入院したのに対し、完全血行再建術を施行された患者におけるその割合はわずか5%であった。MIおよび死亡の割合は2群間で同等であった。予定外の血管形成術目的で再入院した患者のうち、両群ともに40%以上の患者が緊急血行再建術を考慮された。この治療法は予定外の血行再建術またはバイパス術の割合を軽減することが明らかになったが、死亡やMI再発には差がなかったことに筆者らは驚いている。

Full Text

Patients who experience an ST segment elevation myocardial infarction (STEMI) and suffer from substantial narrowing in multiple heart arteries may benefit from receiving angioplasty in constricted arteries not affected by the MI, thereby reducing the need for future angioplasty, according to research presented at the American College of Cardiology's 64th Annual Scientific Session.

The study is the largest prospective, controlled trial to evaluate whether patients should receive preventive angioplasty, also known as complete revascularization, after receiving emergency angioplasty in response to an MI. A total of 627 STEMI patients in Denmark who survived an initial angioplasty procedure were randomized to receive either standard follow-up care or complete revascularization two days after the emergency procedure.

After an average of 27 months, 17 percent of the patients who received standard care returned for unplanned angioplasty or bypass surgery compared to only 5 percent of the patients who received complete revascularization. Rates of MI and death were comparable between the two groups.

Of the patients who returned for unplanned angioplasty, more than 40 percent of patients in both groups were considered urgent revascularizations.

"Our results show that it is safe to do a complete revascularization in this particular patient population," said Thomas Engstrøm, M.D., Ph.D., senior consultant at the University of Copenhagen and the study's lead author. "We think this approach should be implemented in the guidelines, as it may help patients avoid returning for future angioplasty in an urgent manner."

While this approach was found to reduce the likelihood of unplanned angioplasty or bypass, the study authors were surprised to find there were no significant differences in rates of death or repeat MI.

"The neutral impact from complete revascularization on death and repeat heart attacks is informative for physicians [because] if their patients have other risk factors, like poor compliance with dual antiplatelet medical therapy or a need for complex angioplasty that may lead to unsuccessful results, a more conservative approach can be taken without increasing the risk for death or MI," he said.

About 40 percent of STEMI patients are found to have narrowing of other coronary arteries in addition to the one with the blockage that caused their MI. Multivessel disease can substantially increase the risk of death and other cardiac events, such as repeat MI or need for urgent angioplasty. According to the study authors, there is no consensus regarding treatment of multivessel disease; therefore, approaches to reduce the risk are needed.

The trial, which took place in Denmark, included patients who underwent successful angioplasty for STEMI and had multivessel disease with narrowing of at least 50 percent, as well as a fractional flow reserve of less than 0.80 measured with a guide wire-based procedure that can accurately measure blood pressure and flow through a specific part of the coronary artery.

The results add to mounting evidence showing preventive revascularization to be beneficial in certain patients.

Engstrøm said research is needed to look into whether or not complete angioplasty can be conducted earlier than two days post-STEMI. The researchers' rationale for this timeframe—two days after the initial procedure—was to let the patient's body recover and to allow for more accurate identification of arteries in need of angioplasty.

The study was funded by the Danish Agency for Science, Technology and Innovation and the Danish Council for Strategic Research.

ACC2015特集

SAPIEN 3心臓弁の30日合併症率は低い (Abstract 404-14)

PARTNER II S3：第三世代TAVRシステムは死亡率、脳卒中および弁周囲逆流発現率が低い

PARTNER II S3: Third generation TAVR system associated with low mortality, stroke and paravalvular regurgitation

SAPIEN 3心臓弁は死亡、脳卒中および弁周囲逆流発現率が旧世代の人工弁よりも手術の高リスク患者において低く、また中等度リスク患者においても有望な結果を示した、との研究結果が第64回American College of Cardiology学会で発表された。PARTNER II S3トライアルでは、施術中に使用するバルーン拡張システムが最新の改良版であるSAPIEN 3弁を用いた経カテーテル大動脈弁置換術（TAVR）の30日間の転帰を評価した。高リスクまたは手術不能なスタディ対象患者583人に加え、中等度リスク患者1076人がこの新しいデバイスを用いて治療を受けた。30日間死亡率は極端に低く、脳卒中発症率は両群ともに約1%であり有意な弁周囲逆流は稀であった。死亡率は高リスク群で2.2%であり、中等度リスク群で1.1%であった。高リスク群の死亡率の1.4%および中等度リスク群の死亡率の0.9%が心臓関連死であった。高リスク患者の脳卒中率は1.5%であり、うち0.9%は身体障害の状態であった。中等度リスク群におけるこれらの割合はそれぞれ2.6%および1%であった。研究者らは、これらの結果は30日間のデータでありさらに長期の追跡が必要であると強調している。

Full Text

The SAPIEN 3 heart valve demonstrated lower death, stroke and paravalvular leak rates than earlier generation devices in patients at high risk for surgery and showed encouraging results in intermediate-risk patients, according to research presented at the American College of Cardiology's 64th Annual Scientific Session.

Transcatheter aortic valve replacement (TAVR) is approved for patients with severe aortic stenosis whose health profile makes them ineligible or high-risk candidates for surgery. This trial, called PARTNER II S3, evaluated 30-day outcomes with the SAPIEN 3 valve, the latest modification of the balloon-expandable system used in these procedures. This is the first presentation of large-scale data for the third-generation device and the first report of outcomes in intermediate-risk patients in the United States.

In addition to the study's 583 high-risk or inoperable patients, 1,076 intermediate-risk patients were treated with the new device. The death rate was 2.2 percent, or 13 patients, in the high-risk group and 1.1 percent, or 12 deaths, in the intermediate-risk group. Heart-related deaths accounted for 1.4 percent of the mortality in the high-risk group and 0.9 percent in the intermediate-risk group. High-risk patients had a stroke rate of 1.5 percent, 0.9 percent of them disabling; in the intermediate-risk group, those rates were 2.6 percent and 1 percent, respectively.

"The 30-day mortality rates were extremely low, stroke rates were approximately 1 percent in both groups and significant paravalvular regurgitation was rare," said Susheel Kodali, M.D., director of the Heart Valve Center, Columbia University Medical Center/New York-Presbyterian Hospital, New York City, and a co-principal investigator of the study. "Death and stroke rates have been decreasing with every modification of the SAPIEN system."

Major vascular complications occurred in about 5 percent of high- and intermediate-risk patients, a reduction of two-thirds compared with the first-generation SAPIEN system. Other clinical events also were reduced from results in previous SAPIEN studies, including myocardial infarction in 0.5 percent of patients, injury to the aortic area called annular rupture in 0.3 percent and coronary obstruction in 0.3 percent. A new permanent pacemaker was implanted in 13 percent of high-risk patients and 10 percent of intermediate-risk patients, a slightly higher rate than with earlier balloon-expandable valves.

Paravalvular leak has been associated with poorer outcomes after TAVR. The third-generation model used in this study was modified with an outer skirt designed to reduce leak by sealing gaps around the valve. With the new device, 3.7 percent of patients had moderate leak and 0.1 percent had severe leak. By comparison, currently approved devices have rates of moderate or severe paravalvular leak in the range of 10 to 20 percent.

Other alterations allow the valve to be delivered with a smaller catheter, increasing the percentage of procedures that can be performed via the femoral artery, a route preferred because of better outcomes. When transfemoral delivery is not possible, the route is generally through the ribs.

"For the first SAPIEN devices, we were able to use the less invasive transfemoral approach in about 60 percent of patients," Kodali said. "For SAPIEN 3, more than 90 percent of procedures can be transfemoral."

One-year data for high-risk patients with the new device will be available later in 2015. Longer-term outcomes for the intermediate-risk patients treated with the new device will be compared with the intermediate-risk surgical patients in the PARTNER IIA trial once the two-year endpoint is reached. Patients will be followed for five years.

"We needed to see if we've solved the valve leakage issue before we move to lower-risk patients," Kodali said. "Although we have to wait for longer-term data, what we've seen thus far makes us excited about those data and what they'll show."

Kodali emphasized that these are 30-day data and that longer-term follow up is required.

Edwards Lifesciences sponsored the trial. The hospital conducts training programs for the company, and Kodali receives compensation from the company for travel related to the trial.

Special note: Michael Davidson, a surgeon from Boston and one of the original PARTNER clinical trial investigators, was killed in January at the age of 44 by the son of a former patient. ACC and the PARTNER trial team dedicate this presentation and journal paper to his memory.

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