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Improving Care Through a Bidirectional Geriatric Cardiology Consultative Conference

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Abstract

There are over 13 million persons in United States over age 65 with cardiovascular disease, and this population is expected to increase exponentially over the next several decades. In the absence of clinical studies that would inform how best to manage this population, there is an urgent need for collaborative and thoughtful approaches to their care. While cardiologists are traditionally regarded as leaders in the care of older patients with cardiovascular disease, this population is complicated by multiple comorbidities, physiologic differences, and unique goals of care that require a specialized geriatric lens. Thus collaboration is needed between geriatricians, cardiologists and multiple other specialists in order to address the special needs of this growing population. Accordingly, clinicians at NYU Langone Health/NYU School of Medicine established a monthly Geriatric Cardiology Conference to foster an integrative approach to the care of older adults with cardiovascular disease by uniting specialists across disciplines to collaborate on treatment strategies. At each conference, an active patient case is discussed and analyzed in detail, and a consensus is reached among participants regarding optimal treatment strategies. The conference attracts faculty and trainees at multiple levels across geriatrics, cardiology and cardiothoracic surgery specialties. The model developed at NYU may serve as a paradigm for other institutions moving towards geriatric-informed care for older adults with cardiovascular disease.

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Cardiology; geriatrics; multidisciplinary; innovation

BACKGROUND

With increased life expectancy, the population of older adults in the United States is expanding rapidly. Between the years 2000 and 2030 the number of persons aged ≥ 65 years is estimated to increase from 40 million to 72 million, and the number over the age of 85 will increase from 5.8 million to 8.7 million.^{1,2} It is well known that older adults have unique medical needs due to their increased likelihood of having multiple chronic conditions,³ age-related impairments (such as frailty and impaired cognition), and potentially different values and goals of care.⁴ While the burden of cardiovascular disease (CVD) increases with advanced chronological age,^{5,6} older adults remain underrepresented in cardiovascular research leading to a paucity of rigorous data to guide their care.⁷ Moreover, the current compartmentalization of medicine too often leaves older patients followed by multiple specialists with discordant advice, leading to confusion as well as long lists of potentially inappropriate or unreconciled medications.⁵

In this context, the field of Geriatric Cardiology aims to improve the care of older adults through several innovative approaches,^{8–11} one of which is promoting interdisciplinary care. At New York University (NYU) Langone Health (NYULH)/NYU School of Medicine in New York City, where over twenty thousand patients with CVD age ≥ 65 were cared for in 2016, we have attempted to translate this theory into practice by establishing a monthly interdisciplinary Geriatric Cardiology Conference. This conference serves the needs of older patients by providing a structured format for all members of the care team to discuss treatment strategies for patients at a clinical crossroads. In this paper we describe the rationale, format, and preliminary findings from our conference, which may serve as a paradigm for other medical centers that are looking for innovative models that can assist in providing interdisciplinary cardiovascular care for older adults.

CONFERENCE OBJECTIVES

The main objectives of the conference are to: (1) to optimize the cardiovascular care of older adults at NYULH by providing clinicians, and ultimately their patients, the opportunity to make informed choices regarding their care through pooling expertise across disciplines; and (2) to enhance cross-specialty learning by exposing attending clinicians and trainees (fellows, residents, medical students) to the interdisciplinary care of older patients with complex medical conditions.

Similar to Multidisciplinary Cancer Conferences (MCC)¹² which have been shown to change management decisions for cancer patients,¹³ the NYULH Geriatric Cardiology Conference provides a structure and process for synthesizing useful clinical feedback to referring clinicians with a letter summarizing the discussion and recommendations following each meeting. While a single case is presented at each conference, we expect that each deliberation can help elucidate management strategies for similar future cases. Because

clinicians caring for older adults do not have clear management guidelines, organizing an interdisciplinary team with extensive collective experience treating older CVD patients offers the referring clinician additional expertise to inform their current strategies, as well as ideas for alternative management.

CONFERENCE DESCRIPTION

Any clinician within NYULH can submit a request for their patient's case to be presented in this conference. These submissions represent current clinical dilemmas, rather than those that have already reached some stage of conclusion. The conference organizers select one case each month based on the estimated potential for conference deliberations to influence the patient's care, as well as for pedagogical value to conference attendees. Cases must involve a "clinical crossroads" – for example a decision to start/stop a medication, undergo a cardiac procedure (e.g. defibrillator, valve replacement), or move towards less aggressive care. There have been a consistent number of referrals (one patient per month) since conference inception.

By design, all patients presented are over the age of 70. The following clinical data are presented: (1) description of medical and social history, including diagnostic laboratory and imaging data; (2) current list of medications (including over-the-counter supplements); (3) status of geriatric impairments (e.g. frailty, cognitive impairment); (4) summaries of last several clinic visits; and (5) goals of care, as described by the patient during the most recent clinical encounter. For sake of standardization in measuring geriatric impairments, we have had discussions about a list of "essential tools" (e.g. Mini Cog) that cardiologists could administer quickly at clinical visits; however, this has not yet been implemented. In each case, the patient name and other identifiable information is omitted to protect patient privacy.

The conference coordinator organizes de-identified information from the referring clinician into a standard spreadsheet for each patient case (summarized in Supplementary Table S1), and distributes it at the beginning of each conference. The presenter introduces the case and performs a slide presentation of relevant clinical data including level of independence, values, and goals to achieve a patient-centered approach. After reviewing the case, she/he poses management questions referring to the questions at hand – typically relating to the patient's medication list, diagnosis, treatment strategies, goals of care, or operative risk. Subsequently practitioners of different backgrounds discuss the patient's treatment options, including the effectiveness of therapies, condition-related prognosis, interaction between the condition and relevant comorbidities, and issues related to polypharmacy (Figure 1). The conference coordinator distributes an electronic summary to conference attendees regarding the case's major clinical questions and resolutions.

To date, patients presented at this conference have been 70 to 95 years (mean: 84.8 years; SD: 6.4 years). Of those represented 44% were female. Patients were taking an average of 11 medications. The majority of presentations (60%) focused on questions about medical management (including tailoring medical therapy and reducing polypharmacy), while 33%

were questions on the appropriate use of procedures, 33% involved advanced care planning or end of life decisions, and 13% were diagnostic dilemmas.

CONFERENCE ATTENDANCE AND EVALUATION

Since its establishment in 2014, out of 24 presentations (12 unique referring clinicians), 15 have been presented by attendees affiliated with cardiology. Trainees (residents or fellows) presented 4 of the conferences, and 20 were presented by faculty. Disciplines represented to date have included geriatrics (at NYULH, geriatricians generally serve in a primary care role), cardiology (including interventional cardiology and advanced heart failure), cardiac surgery, neurology, nephrology, and oncology.

Although the conference's first session was in November 2014, we began collecting conference data and participant feedback in January 2017 to assess its value to participants. From data obtained during 2017, average participant attendance has been 17 per session. Among participants, 52% have been from geriatrics, 28% from cardiology and 20% were from other specialties. The training level of participants has been 45% faculty, 21% medical students, 17% trainees or fellows, 10% research staff, and 6% NP or PA's. Among the number of surveys completed (N=95), 95% agreed or strongly agreed that the discussion would change the way they currently manage similar patients, and all agreed or strongly agreed that the case discussed was relevant to their own clinical practice.

Case Examples

A full listing of cases presented since inception is shown in Supplementary Table S2. Two themes that commonly emerged among these cases were (1) the appropriateness of procedures (for example, aortic valve replacement) in the setting of multiple comorbidities and geriatric impairments and (2) tailoring medical therapy to align with patients' goals. In the latter case, geriatricians generally weighed in on the appropriateness of non-cardiac medications (including both prescription drugs and over-the-counter supplements) while the cardiologists generally weighed in on cardiac medications including antihypertensive and anticoagulant therapies. The following two cases illustrate typical patients and management decisions made at the conference.

Case I (April 2015)

The first case involved an 87-year old woman with a history of cerebral microhemorrhages seeking optimal strategies for stroke risk reduction.

The patient had a history of hypertension, hyperlipidemia, paroxysmal atrial fibrillation, osteoporosis, prior transient ischemic attack (TIA), and chronic pancreatitis. She had a mechanical fall with a left hip fracture, which was complicated by postoperative atrial fibrillation. She also had a prior admission with acute mental status changes which was thought to be delirium in the setting of polypharmacy. In 2013, she had an MRI for TIA after some transient difficulty walking, which demonstrated her cerebral microhemorrhages.

At her cardiologist visit (two months prior to the conference) her medications included diltiazem, rosuvastatin, aspirin, cholecalciferol, Vitamin D3, and folic acid. Her blood pressure was 118/70 and her pulse was 71. She was walking 20 minutes per day on the treadmill. She was independent in all ADLs and IADLs, with mild dementia. For further recommendations on the patient's best options for anticoagulation therapy given prior cerebral microhemorrhages, her cardiologist referred her to a neurologist.

Her neurologist ordered a repeat MRI (two years after the previous study) and found and found a dramatic increase in the number of micro-hemorrhages. The dramatic increase was suggestive, in the neurologist's clinical opinion, of cerebral amyloid angiopathy.

The patient's cardiologist and neurologist presented her case to the Geriatric Cardiology Conference in April 2015. The first management question was whether her current prescription of 81 mg of aspirin was optimal anticoagulation therapy, or if the patient would benefit from switching to apixaban or another anticoagulant (patients with cerebral micro-hemorrhages would have been excluded from prior studies of anticoagulants). After much deliberation among all attendees, given the amyloid-like characteristics on MRI, which are associated with significant recurrent bleeding risk, low-dose aspirin was concluded to be the best option as it posed the lowest potential risk for bleeding.

Recently, several devices have been developed for occlusion of the left atrial appendage (LAA) including the Watchman device, a transcatheter implant that is placed in the LAA, as well as the Lariat procedure, which occludes the LAA via a pericardial approach. Her cardiologist acknowledged that for the LAA occlusion with a Watchman occluder device would require short-term dual anti-platelet therapy, which may place the patient at an unacceptable risk of bleeding. However the Lariat suture device did not require administration of anticoagulants and was discussed as a possibility. Although reducing stroke risk without anticoagulants was appealing, the invasive procedure raised questions as to appropriateness given that this was for an 87 year-old woman with multiple comorbidities. The consensus was to offer the patient and her daughter the option of LAA occlusion with a Lariat device and allow them to make a decision based on the recommendation.

At her subsequent clinical encounter, the patient was offered the option for the Lariat device, but because her daughter did not want to accept the risk of implanting the device, and they decided to continue with medical management. The patient is stable and doing well two years later.

Case II (January 2017)

The second case involved the question of suitability of minimally invasive aortic "valve in valve" replacement in an 85-year old female (status-post bioprosthetic aortic valve replacement).

The patient was referred by her cardiologist to the NYU Heart Valve Clinic in January 2017 after an echocardiogram in December 2016 revealed severe prosthetic aortic insufficiency, aortic stenosis and native mitral valve stenosis. She had a

mechanical fall with a left hip fracture which was complicated by postoperative atrial fibrillation. She was a retired speech pathologist, living alone in her apartment.

The patient had medical history of atrial fibrillation, leg ulcers, pulmonary hypertension, mitral stenosis/regurgitation and bioprosthetic aortic stenosis/regurgitation. She had progressive dyspnea on exertion, which began worsening in the summer of 2016. By December, she experienced dyspnea after walking only a few feet. She also was experiencing worsening leg edema.

Upon presentation in January, her medications included trazadone, diltiazem, potassium, coumadin, lutein, coenzyme-Q, vitamin D, budesonide, pitavastatin, digoxin, prilosec, and furosemide. Her blood pressure was 130/66 and her pulse was 70. She appeared breathless after ambulating several feet. She had 2+ ankle pitting edema to the thigh bilaterally. She was completely alert and oriented. She was sent for a CT angiogram, a transesophageal echocardiogram, and a cardiac catheterization for further information.

The CT angiogram showed she had optimal trans-femoral access, the TEE showed severe transvalvular aortic insufficiency, elevated transaortic velocity, severe calcific mitral stenosis, and moderate-to-severe mitral regurgitation, and her cardiac catheterization showed non-obstructive coronary artery disease.

A member of the cardiac surgery team presented her case at the Geriatric Cardiology conference in January 2017. The management questions regarding her treatment options were as follows: (1) continued medical management; (2) surgical replacement of the aortic and mitral valves; (3) transcatheter aortic valve-in-valve procedure, and manage mitral stenosis conservatively; (4) transcatheter aortic valve-in-valve procedure plus robotic mitral valve surgery?

It was the consensus of the group that medical management was not achieving the patient's goals of being able to perform daily activities without considerable dyspnea. The group also agreed that reoperation via sternotomy would be associated with prohibitively high risk; therefore a stent valve-in-valve aortic procedure with the largest valve possible was advised. In light of the patient's intact cognition and goals of care, combined with local surgical expertise, the patient underwent the aortic valve-in-valve procedure in February 2017. Her echocardiogram in March showed the stent valve was well-seated, with no evidence of aortic regurgitation. Her ejection fraction was 78%. Her referring cardiologist noted she was doing better clinically although her pulmonary artery systolic pressures remained elevated. She reported regaining independence in her ADLs and also saw an improvement in her dyspnea (which corresponded to her goals of care). While she continued to have mitral stenosis and regurgitation, there were no overt signs of heart failure.

DISCUSSION

Since its inception in 2014, the NYULH Geriatric Cardiology Conference has provided a framework for interdisciplinary, patient-centered care of older adults with cardiovascular disease who are at a clinical crossroads. By pooling the expertise of geriatricians,

cardiologists, surgeons, and other specialists, and arriving at a group consensus, we aim to avoid the fragmented care and differing opinions that these patients often experience in routine clinical practice. To our knowledge, this conference is the first of its kind in the U.S., although models for other conditions (such as oncology tumor board for cancer) have been in existence for decades.

Current guidelines in cardiology are insufficient in addressing the particular needs and complexities of older patients, as they are largely based on evidence from younger trial participants with a low burden of comorbid medical conditions.¹⁰ Because care for older adults cannot be protocolized,⁹ each case requires additional time and interdisciplinary consideration. Simultaneously, clinicians are facing increased time demands in their outpatient practices, and coordination with other specialists can be challenging (including even a simple phone call). In this context, we believe that it is critical for clinicians to pool their expertise and come to a consensus that can otherwise take months in usual clinical practice.

A primary aim of the conference is to explicitly focus on the patient's goals of care, which among older adults can include maintaining independence or avoiding hospital admission³ rather than longevity. This has been a key principle of geriatric medicine for decades and is reinforced at each conference by our geriatricians in attendance. Cardiovascular medicine is moving towards this paradigm, largely in the setting of changing demographics and an increasing recognition that consensus guidelines fall short in the oldest old.⁹ Thus, decisions in this population need to be individualized and contextualized, which often requires more time and attention than less complex cases.

Data collected since early in 2017 demonstrate that conference participants have found cases to be helpful in their own practices, and consider the meeting a source of guidance and affirmation in a field with limited clinical evidence. In addition, anecdotally, this interdisciplinary strategy has fostered collegiality outside of the conference by serving as a precedent for open communication between specialties, allowing clinicians to more freely approach each other for informal advice. As one conference attendee (a cardiologist) describes "For me personally, I think the conference has provided a sense of comfort in understanding that it is OK to ask for help with these very difficult cases, and to realize that we all struggle not knowing the right thing to do in the absence of data. Knowing that geriatricians can many times, fill in these knowledge gaps for me, provides ongoing motivation for collaboration."

We acknowledge that our experience is limited to a single institution and our efforts may not be scalable across other healthcare settings. However, the overwhelming majority of large academic medical centers in the U.S. have separate cardiology and geriatrics divisions, as well as meeting space and a culture of regular conferences (e.g. grand rounds, morbidity and mortality, research-in-progress). While there may be potential concern over clinicians' busy schedules, we found that within our center after agreeing upon a regular time (Tuesday, 8 AM) that worked for core members, attendance has remained robust. We also have an administrative coordinator with a proportion of time devoted to supporting conference logistics, which includes soliciting cases, scheduling meeting times, sending reminders,

generating summary spreadsheets, helping organize presentation slides, and drafting conference summary letters. This reduces the administrative burden on clinicians and presenters. Outside of the academic setting, extending the conference may be challenging in the current U.S. healthcare environment, which places a tremendous emphasis on clinical productivity. To address this issue, at NYU we welcome referrals from community clinicians who may not be able to attend but desire the expertise of our group. To date, individual conference organizers have given several talks to community cardiologists about this venue, and outreach efforts are ongoing. Moving forward, we have held internal discussions about broadening the reach of our conference to clinicians at remote locations via telemedicine. This may be a viable option for expanding the reach of our conference to both clinician “virtual attendees,” as well as patients and their caregivers.

In conclusion, we believe our conference serves as an example of a pragmatic approach to implementing the concept of geriatric cardiology within an academic medical center. Ultimately, we hope that this conference may serve as a paradigm for other institutions aiming to optimize patient-centered care, and equip older adults with the tools to make more informed choices.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Factors Influencing Management Recommendations at NYU Langone Health Geriatric Cardiology Conference