Clinical Experience

ECHO-AGE: An Innovative Model of Geriatric Care for Long-Term Care Residents With Dementia and Behavioral Issues

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A B S T R A C T

Objectives: To design, implement, and assess the pilot phase of an innovative, remote case-based video-consultation program called ECHO-AGE that links experts in the management of behavior disorders in patients with dementia to nursing home care providers.

Design: Pilot study involving surveying of participating long-term care sites regarding utility of recommendations and resident outcomes.

Setting: Eleven long-term care sites in Massachusetts and Maine.

Participants: An interprofessional specialty team at a tertiary care center and staff from 11 long-term care sites.

Intervention: Long-term care sites presented challenging cases regarding residents with dementia and/or delirium related behavioral issues to specialists via video-conferencing.

Methods: Baseline resident characteristics and follow-up data regarding compliance with ECHO-AGE recommendations, resident improvement, hospitalization, and mortality were collected from the long-term care sites.

Results: Forty-seven residents, with a mean age of 82 years, were presented during the ECHO-AGE pilot period. Eighty-three percent of residents had a history of dementia and 44% were taking antipsychotic medications. The most common reasons for presentation were agitation, intrusiveness, and paranoia. Behavioral plans were recommended in 72.3% of patients. Suggestions for medication adjustments were also frequent. ECHO-AGE recommendations were completely or partially followed in 88.6% of residents. When recommendations were followed, sites were much more likely to report clinical improvement (74% vs 20%, P < .03). Hospitalization was also less common among residents for whom recommendations were followed.

Conclusions: The results suggest that a case-based video-consultation program can be successful in improving the care of elders with dementia and/or delirium related behavioral issues by linking specialists with long-term care providers.

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Older residents of nursing homes frequently suffer from behavioral problems associated with dementia and delirium. As a result, these elders are at high risk to receive dangerous psychoactive medications to control their behaviors. However, recent reports suggest that 40% of nursing home residents without psychosis are taking antipsychotic medications and that 32% of these had no identifiable clinical indication for this therapy. The significant shortage of geriatricians, geriatrics psychiatrists, and behavioral neurologists exacerbate this problem because these vulnerable elders often lack access to the appropriate specialty care.

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experts in the management of behavior disorders in patients with dementia to nursing home care providers.

Methods

The research protocol was approved by the Institutional Review Board at Beth Israel Deaconess Medical Center. A waiver of informed consent was obtained to review medical records and interview nursing home providers.

ECHO-AGE is based on the Extension for Community Healthcare Outcomes (Project ECHO) intervention developed by Dr Sanjeev Arora to similarly address shortages of knowledge and medical staff for the management of Hepatitis C in rural New Mexico.5 After more than a decade of rigorous evaluation, Project ECHO has proven to be effective for improving patient outcomes at significantly reduced costs to patients, clinical specialists, New Mexico’s healthcare system, and Medicaid. Since its inception, the ECHO model has been expanded to 15 healthcare organizations across the world to address a variety of complex chronic conditions for which patients were traditionally required to seek medical attention at a teaching hospital or tertiary care center.6 This model is overcoming limitations in access to healthcare for vulnerable populations and individuals in rural areas. Building on the original ECHO model, we developed and launched ECHO-AGE in 2012 with a 2-part aim. The first was to improve the quality of clinical care provided to residents of long-term care facilities with behavioral problems related to dementia and/or delirium. Second, ECHO-AGE aimed to train providers in these facilities to become experts in delivering care to this vulnerable patient population. Through the ECHO model, these patients would receive better quality of care within their own community and from their own providers, thereby ultimately offsetting costs associated with obtaining specialty care from outside the long-term care facility. In addition, ECHO-AGE established a learning community of primary care providers and specialists, thus, reducing the workforce shortage in geriatric medicine by creating “mini-specialists” within the community.

We focused on residents and providers in long-term care facilities for several reasons. (1) Most long-term care providers are not formally trained in geriatrics but provide much of the care for vulnerable elders. (2) Elders living in long-term care facilities have the highest rate of hospitalizations/cost to the healthcare system. (3) Traditionally, elders who require geriatric specialty care must travel to a specialty clinic or medical center, which is burdensome, time inefficient, and costly. (4) Many long-term care providers also provide primary care in the community so relationships could be fostered for future expansion of a geriatric ECHO into community primary care practices to assist in the care of community-dwelling elders with dementia. Secure, HIPAA compliant video-consultation technology was used to facilitate longitudinal co-management of patients between the specialty team at the Beth Israel Deaconess Medical Center (BIDMC) and participating long-term care sites. A case-based format supported guided feedback from specialists, iterative learning, and the opportunity for the long-term care sites to learn from each other and participate in shared case management decision-making.

The ECHO-AGE inter-professional specialty team at BIDMC consisted of a geriatrician, geriatrics hospitalist, geriatrics psychiatrist, behavioral neurologist, and community resource specialist. Long-term care sites participated in bimonthly 1.5-hour long sessions via secure videoconferencing. During these sessions, long-term care providers presented de-identified cases to the ECHO-AGE team for input and care management suggestions. Typically, 2 to 4 new and follow-up cases taking approximately 30 minutes each were presented during each session. Teaching “pearls” were embedded into the presentations in the form of summaries of findings and “take-home recommendations.” Patients’ families were invited to participate in the discussion, but this has occurred rarely during the inaugural year of the program. During the pilot phase of ECHO-AGE from June 2012 through June 2013, 47 unique cases were discussed during a total of 99 presentations.

Identification of Participants and Selection of Cases

Long-term care sites volunteered to participate in the program after learning about it through an informational pamphlet distributed at a Harvard Geriatric Medicine CME course and via word of mouth. In May, 2012, 6 sites attended a 1-day symposium in Boston to learn about the ECHO concept, logistical requirements, and basics of delirium and dementia management. Currently, there are 11 long-term care sites participating in ECHO-AGE on a regular basis. These partnering sites are located in Massachusetts and Maine. Facilities participating are both for-profit and not-for-profit and range in size from 62 to 355 beds. Participants from these sites include physicians, advanced practice clinicians (eg, nurse practitioners and physicians assistants), registered nurses, nursing assistants, and social workers. It should be noted that physicians comprise <10% of participants. Sites are expected to engage in 8 ECHO-AGE sessions every 6 months and are encouraged to bring cases for presentation as often as they feel is needed. The long-term care sites currently incur no financial cost for participating in ECHO-AGE beyond the cost of staff time and a modest cost for video communication technology equipment (see below).

The long-term care sites independently choose cases to present to the ECHO-AGE specialty team. Forty-eight hours prior to the case presentation, sites utilize a secure fax machine to forward patient information for review. Requested information includes patient age, insurance data, main concern, history of present illness, past medical history, functional assessment, and basic laboratory and imaging data. Cognitive data are also collected including the Geriatric Depression Scale score, tests of attention (months of the year forward and backward, days of the week forward and backward, counting down from 20 by 2, and counting down from 20 by 1), digit span, orientation, and clock drawing. Sites are also encouraged to perform a complete Montreal Cognitive Assessment and include an updated medication list. After the initial presentation, sites bring cases back to the ECHO-AGE team for follow-up as often as they feel will be helpful. The specialty team is also available by telephone or email for more urgent issues that may arise between the ECHO-AGE sessions.

Technology Requirements

Although technology is vital to enabling secure interactions between the ECHO-AGE team at BIDMC and participating long-term care sites, it is not a focus of the program and ideally fades into the background during clinical discussion. The technology hub for ECHO-AGE at BIDMC allows for “real-time” secure audio, visual, and data transmissions with the long-term care clinicians. Supported by a state-of-the-art institutional videoconferencing infrastructure provided by our information technology team, the only technology requirements of the long-term care partners are a computer with camera, an internet connection, and a 15-minute software/registration process.

Results

Baseline Characteristics

Of the 47 participants presented in the first year pilot of ECHO-AGE, 12 were male and 35 were female. They ranged in age from 49 to 103 years with a mean age of 82 years (SD = 12.6 years).
Participants resided at the long-term care facility for a median of 18 months. Medicare and Medicaid were the primary payers in 91% of cases. Eighty-three percent of participants had a reported history of dementia and 36.2% were noted to have suffered from delirium previously. They were taking an average of 14 medications, with a range from 4 to 31, on initial presentation. Forty-four percent of participants were taking antipsychotics and 68% were taking antidepressants at baseline. Agitation, intrusiveness, paranoia, and increase in confusion were the most common reasons identified by the long-term care facilities for presentation of participants at ECHO-AGE and accounted for 89% of cases (Table 1).

Recommendations

The majority of patients were presented 2 times during ECHO-AGE clinics with the number of presentations ranging from 1 to 6 times. Recommendations were divided into the following categories: medication initiation or adjustments, behavioral plans, laboratory testing, and referrals. Discontinuation or dose reduction of antipsychotic medications was recommended in 34% of participants. Antidepressants and other psychoactive medications, most commonly benzodiazepines, were also frequently recommended to be reduced in dose or discontinued. Antipsychotic or antidepressant medications were started or the dosage was increased in 17.2% and 48.3% of participants, respectively. Cases in which initiation of an antipsychotic was recommended included untreated mental illness (bipolar disorder and psychosis) and sexually inappropriate behavior following an anoxic brain injury. Other psychoactive medications, most frequently melatonin and cholinesterase inhibitors, were recommended in 34.5% of participants. Behavior plans were discussed in all participants and new recommendations were made in 72.3% of cases. These plans were wide ranging but most often included positive reinforcement for desired behavior. Laboratory testing was recommended in 13 participants. Labs requested included therapeutic drug levels, electrolyte measurements, thyroid stimulating hormone, vitamin B12, and urinalysis samples. Brain imaging was only recommended in 1 case where the patient had focal neurologic deficits and sudden onset in symptoms. A total of 6 referrals were recommended: 3 to hospice, 2 to an inpatient psychiatric service, and 1 to outpatient neurology (Table 2).

Outcomes

Evidence suggests overall positive outcomes for residents presented during ECHO-AGE sessions. At the conclusion of the pilot study, 3 patients were lost to further follow-up. Of the 47 residents with reported outcomes, 7 participants died and 14 required hospitalization, which was related to the reason for presentation in 64.3%
Anecdotal evidence suggests that ECHO-AGE is not only helpful on a case by case basis through a “ripple effect” throughout participating facilities. For example, in 1 case a nursing home resident was having significant sleep disturbances. The expert team recognized that the resident was most likely having vivid dreams related to taking donepezil at bedtime. The recommendation was made to move her dosage of this medication to the morning and during a follow-up presentation the long-term care site reported that the patient’s sleeping issues had resolved. In addition, they reported that they had changed the timing of this medication for all of their patients and reported that approximately 50 residents were now sleeping more soundly.

### Discussion

We conducted a pilot study to evaluate the experiences and outcomes of a video-consultation program, which sought to improve the care of elders with dementia and/or delirium related behavioral issues by linking specialists with long-term care providers. Prior studies have evaluated the utility of telemedicine in nursing home care and found improved patient outcomes, including decreased hospitalizations, when the service was used on a regular basis. In addition, literature suggests that healthcare providers in long-term care and families of residents are very interested in telemedicine services. The ECHO-AGE model differs from prior studies evaluating telemedicine in long-term care facilities because it uses video technology to provide consultation and education to primary care providers but does not actually deliver care itself. It is based on the Project ECHO intervention, through which case-based discussions are used to train long-term care providers to become mini geriatric medicine specialists. Dr Sanjeev Arora, the founder of the ECHO model, has studied outcome data on hepatitis C for a very similar ECHO program. Surveys of community clinicians showed a significant improvement in knowledge, self-efficacy, and professional satisfaction secondary to their participation in the ECHO hepatitis C clinics. In addition, evaluation of patient outcomes showed that the ECHO model was effective in treating hepatitis C virus with patients in the community having similar response rates to those at the tertiary care center.

Our pilot study of ECHO-AGE demonstrated a high degree of engagement among long-term care sites participating in the program with a majority of participants being presented multiple times. Recommendations of the multidisciplinary team were followed in the majority of cases and, among those patients, significant clinical improvement was reported by the long-term care sites. In addition, lower hospitalization rates were observed among patients in whom ECHO-AGE recommendations were followed and improvement was reported, but this was not statistically significant due to the small sample size of this pilot study (21% vs 50%).

This study has several limitations. ECHO-AGE was piloted at a large academic hospital with a strong geriatric medicine program and in long-term care facilities in New England. Its implementation may not be generalizable to other settings. The pilot study was also not powered or controlled to rigorously evaluate patient outcomes. Currently, a more rigorous evaluation is being conducted to evaluate outcomes including use of healthcare services, antipsychotic medications, and restraints among sites participating in ECHO-AGE compared with matched controls. Finally, the most common reason cited by participating sites for patient presentation was agitation. This is a generalized term and was used to include rejection of care as well as signs of verbal or physical distress. Separating these into specific categories would be informative in future analysis.

There is significant potential for ECHO-AGE to become a national model for improving long-term care by establishing multidisciplinary
teams at medical centers around the nation who reach out to relatively isolated facilities in their regions. The same model could also be used to raise the level of expertise in geriatric medicine among community-based providers, making them local experts who can provide independent geriatric appropriate care and serve as a resource for other providers. The video consultation needs of ECHO-AGE are easily met with readily available software and low cost computers and cameras. A potential barrier of overcoming institutional firewalls while maintaining privacy can be overcome by assigning confidential patient numbers, maintaining the privacy of personal health information, and encrypting information that is transferred between facilities electronically. Another possible challenge is satisfying medical licensing requirements in some states that do not allow licensed physicians from other states to consult with their physicians. Because ECHO-AGE consultants are not actually delivering direct patient care, this barrier should also be surmountable.

Conclusions

This pilot study evaluated the experiences and outcomes of a video-consultation program for long-term care providers focused on residents with dementia and/or delirium and behavioral issues. Overall, involved sites were highly committed to the program and often presented patients to the specialty team on multiple occasions. Among the patients in whom ECHO-AGE recommendations were followed, the long-term care sites reported clinical improvement, a trend toward decreased hospitalization, and decreased mortality.

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