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Practical Protocol for Implementing Cognitive Stimulation in Persons with Delirium Superimposed on Dementia

Ann M. Kolanowski[1,*], **Nikki Hill**[1], **Linda Clare**[2], and **Patricia Marx**[1]

[1]School of Nursing, Pennsylvania State University, University Park, PA., US

[2]Department of Psychology, Bangor University, Wales, UK

Abstract

Delirium is common in persons with dementia and often accompanies acute medical or surgical conditions. These individuals are at risk for an accelerated decline in their cognitive and physical function. For this reason, interventions that help resolve delirium are critically needed. We have developed a non-pharmacological intervention for delirium in persons with dementia based on our prior interdisciplinary work on delirium, dementia and cognitive stimulation. The intervention uses recreational activities that are alerting, capture attention, and provide cognitive stimulation that encourages cognitive processing in support of cognitive function. In this paper we describe the practical protocol we have developed for implementing these activities, and present a video that will enhance treatment fidelity for studies that replicate the approach.

Keywords

Cognitive stimulation; recreational activities; delirium; dementia

Introduction

Delirium is defined as a state of increased confusion that is a change from a prior level of functioning and is characterized by a fluctuating decline in cognitive function [1]. Inattention is the primary neuropsychological deficit in delirium. It is not known what causes change in cognition, but delirium is often observed following an insult such as surgery, infection, or adverse medication effects [2]. Delirium is prevalent and deadly in older adults with dementia, those at highest risk. An overwhelming majority of persons with dementia experience delirium when hospitalized, and studies report that between 24 and 76% die within one year of the index episode [3, 4]. It is not uncommon for delirium to persist for months in survivors. These individuals are at risk for an accelerated decline in their cognitive and physical function. Prevention is always a priority; however, it is often

[*]Corresponding author: amk20@psu.edu, Telephone: 814-863-990, Fax: 814-865-3779.

Competing Interests
The authors declare that they have no competing interests.

Author's Contributions
All authors contributed to the development of the manuscript. AMK developed the intervention and the process for its implementation. LC assisted in the classification of activities by cognitive domain. NH and PM developed the script and were instrumental in the production of the video that accompanies this manuscript.

Additional Information on Video
File name: Nursing
Format: http://pspb.org/client/Nursing.zip QuickTime Movie
Title of Data: Training session: Implementing Cognitively Stimulating Recreational Activities
Description of Data: Video illustration of implementing intervention

difficult to *prevent* delirium in this population because of their already reduced cognitive reserve. For this reason, interventions that help resolve delirium are critically needed. Unfortunately, there are few interventions that treat established delirium at the current time because its etiology is not completely understood.

Our research team has developed a non-pharmacological intervention for delirium in persons with dementia based on over 15 years of research and clinical experience. Non-pharmacological approaches are especially desirable in persons with delirium and dementia because many of the medications used in treatment of this syndrome may actually precipitate delirium and contribute to further long term cognitive impairment [5, 6]. Briefly, the intervention uses recreational activities that are alerting, capture attention, provide cognitive stimulation, and thereby encourage cognitive processing in order to support cognitive function.

The study that will test the efficacy of our protocol has been funded by the National Institute of Nursing Research (R01 NR012242), and has received approval from the Pennsylvania State University Institutional Review Board (IRB# 33443). The underlying theory supporting the intervention [7] and the full study protocol [8] have been published. This paper supplements those prior papers by describing, in detail, the *practical* protocol we have developed for implementing cognitive stimulation using simple recreational activities as the vehicle for delivery. A video that illustrates implementation of the intervention accompanies this paper. Our goal is to distribute the practical protocol to a wide audience so that it can be replicated and tested in other settings.

Background

The pathophysiology of delirium has been described and represents a transient disruption of cerebral homeostasis including disruption of cholinergic transmission, dopaminergic excess and inflammation [2]. Clinically there is inattention (the primary neuropsychological deficit), an altered level of consciousness that can range from stupor to hypervigilence, and disorganized thinking. Because the attentional system is a key mechanism in this syndrome, interventions that support attentional skills, which are necessary for cognitive processing in other domains, may assist in recovery from delirium. In addition to attention, we target other cognitive domains affected by delirium: orientation, memory, abstract thinking and executive function.

Cognitive stimulation is a non-regimented intervention that promotes cognitive processing in order to restore cognitive function [9]. Many activities provide cognitive stimulation. Recreational activities such as word searches, board games, or card games deliver cognitive stimulation in a very unobtrusive, enjoyable manner making them particularly appropriate for individuals who may not tolerate formal methods of cognitive training [10]. In our protocol, we use recreational activities that are tailored to personal interests and functional abilities. Attributes of personal interests are that they focus attention, arouse feelings and promote engagement [11]. Research has also shown that when an individual's functional skills are equal to the challenges inherent in an activity, the individual is more likely to become fully engaged, lose track of time, and experience positive emotions [12] Activities that are personally interesting and designed to accommodate functional skills provide intrinsic motivation for participation and help to ensure long term participation, a requisite for maximum benefit [13]. In clinical trials and other studies our tailored activities have repeatedly demonstrated the ability to alert, to increase attention and to engage persons with dementia compared to non-tailored activities [14–16].

Procedure

The following is a description of our practical protocol for implementing cognitively stimulating recreational activities in our current study which takes place in post-acute care settings. To tailor recreational activities so they support cognitive processing, we begin by obtaining data on each study participant's cognitive function, physical function, and activity interests. Standardized instruments with known reliability are used. A research nurse conducts the cognitive and physical function assessments and a close family member provides information on activity interests. In our work we use the Modified Blessed Dementia Rating Scale [17], the Clinical Dementia Rating Scale [18], and the Mini-mental State Exam [19] to assess cognitive function; the Barthel Index [20] to assess physical function; and an adapted version of the Farrington Interest Inventory [21] to assess activity interests. Specific cognitive deficits are noted so that activities are selected to be sufficiently, but not overly, challenging. If spacial orientation is a problem, for example, it might be best to initially avoid puzzles. Many activities depend on vision and/or hearing; for participants with sensory impairments, adjustments need to be made. For example, a hearing amplifier may assist individuals with hearing loss. For participants with vision loss, activities that rely primarily on hearing can be substituted.

Based on the assessment, tailored recreational activities designed around themes of interest are selected by level of difficulty (easy, moderate, and difficult) in the cognitive domains of attention, orientation, memory, abstract thinking and executive functioning. Table 1 lists examples of these activities. As an illustration, an older woman who is in a mild stage of dementia with no severe sensory impairments and whose prior interests involved baking, sewing and gardening might be prescribed: identify the sound of a sewing machine (attention); discuss whether the current calendar month is good for planting (orientation); use memory tray with three or more baking utensils (memory); describe steps to prepare a meal (abstract thinking); and work an "activity apron" (executive functioning).

Activities are implemented for 30 minutes each day, a dosage recommended by expert recreational therapists from the American Therapeutic Recreation Association and the National Recreation Society [22], standard recreational therapy practice in the nursing home, and studies that have demonstrated the efficacy of daily, 30-minute recreational therapy for behavioral symptoms and functional impairment in persons with dementia [23–25].

There are several approaches that help maximize the benefits study participants receive from their prescribed cognitive activities. While the activities themselves are simple and easy to implement, they take considerable planning and organization to ensure treatment fidelity. Our procedure is based on guidance from the literature and over 15 years of experience in the field.

Both the participant and the environment should be prepared for implementation of the intervention. During the intervention, use of proper communication techniques with participants who have delirium and dementia is vital to implementation. We also incorporate principles for implementing cognitive activities as outlined by Green and Bavelier [26]. These include: promoting active engagement; incrementally increasing task difficulty; providing verbal encouragement, motivation, feedback and praise; and offering variability in tasks. Below is the step-by-step procedure we use in our protocol and the corresponding principles of implementation. The video accompanying this paper illustrates the procedure in greater detail (http://pspb.org/client/Nursing.zip QuickTime Movie.)

1. Each participant has his/her own list of prescribed activities and an order in which they are to be implemented over the 30 minute session. This list is consulted every day for any possible changes. Activities are tailored to each participant's interests,

abilities, and adjusted for problems with vision, hearing or language difficulties. The activities are organized in the order they will be given (easy to difficult). An activity cart can be used to organize and transport activities. Principle: treatment fidelity and variability in tasks.

2. The environment where the activities are to be implemented should be scanned to make sure it provides a good working space. Because attention is a problem in delirium, televisions, radios, pagers, and cell phones are turned off unless specifically a part of the session. The lighting level is adjusted so it is appropriate for the activities conducted; avoid areas where glare is a problem. Nursing and housekeeping staff are asked if they will need to provide care to participants or clean the space during the session. The idea is to reduce distracting interruptions and ensure that the environment will support engagement in cognitive activities. Principle: control for extraneous factors that may affect the implementation of the intervention.

3. Upon entering the participant's room or the area where the session will take place, the interventionist should address the participant by his/her preferred name and sit down at his/her eye level. This approach reduces threat. The interventionist should be very cognizant of non-verbal communication: a pleasant manner is essential. The participant should be told the purpose of the session and their assent obtained: "Mrs. Jones, I am here to work with you on some games and activities. They may help in your rehabilitation. Would you like to do that now?" If the participant initially refuses, the interventionist should wait one hour and return to attempt assent. Principle: participant assent and proper communication technique.

4. Each participant should have time for needed bathroom visits prior to the intervention, assistive devices such as glasses/hearing aids should be worn, and complaints of pain should be addressed. Principle: ensure that the participant is maximally receptive to the cognitive activities.

5. Simple phrases, body language, gestures, and demonstration are used to communicate and promote understanding. The emotional expression of the participant, not simply his/her words, is important to note. The participant is not interrupted when speaking. Principle: proper communication technique.

6. The interventionists should speak slowly and never shout. Shouting makes it more difficult for older adults to hear what is being said because it raises the pitch of the voice. Principle: proper communication technique.

7. Implementation proceeds in this fashion: After introducing him- or herself and obtaining assent, the interventionist starts the timer and begins with the easiest level of task/exercise in the cognitive domain of attention. The level of difficulty is increased as success occurs with the simpler task. For example: in the domain of attention, if the participant successfully counts to 10 (easy level), the moderate level of difficulty is attempted by asking the participant to complete the Connect the Dots activity. If successful, the activity prescribed for the most difficult level in the domain of attention is then attempted. If at any point the participant is not able to complete a task/exercise, the interventionist should go on to the next cognitive domain and begin with an activity at the easy level, proceeding as described above. At least one task/exercise is attempted in each cognitive domain. The goal is to complete three activities (easy, moderate and difficult) in each cognitive domain. Principle: treatment fidelity, incremental increases in task difficulty and variability in tasks.

8. To initiate engagement in the activity the System of Least Restrictive Prompts is used [27]. The approach begins with verbal cueing: “Mrs. Jones, I’d like you to pick out all the items that are fruits in this picture.” If there is no response, the interventionist uses both verbal cueing and demonstration of the activity: “Here is an apple. Now you try it.” This system is only used to begin activities. If the participant continues to not respond, the approach in #10 is followed. Principle: active engagement and proper communication technique.

9. The interventionist works with each participant for 30 minutes or until he/she disengages from the activity. Disengagement is demonstrated by: dozing/falling asleep, negative remarks about the activity, turning away from the interventionist/activity, asking to leave, leaving or attempting to leave the area. The interventionist may attempt to re-engage a participant three times by verbally prompting them to continue with the task/exercise. After the fourth disengagement the intervention is stopped. At the 30 minute point or after the fourth disengagement, the interventionist stops the timer and records the time. Principle: active engagement and treatment fidelity.

10. If the participant is too confused or refuses to initiate any activity, the intervention is not attempted at that time. Confusion can fluctuate throughout the day. The interventionist should return approximately one hour later to attempt a second session. If the participant is still too confused to participate in the activities, the activity is not attempted that day. Principle: active engagement and treatment fidelity.

11. During the activity, participants are given enough time to respond to the task/exercise. To aid communication, the same words are used when a question or a request is repeated; paraphrasing is avoided. Principle: proper communication technique.

12. Participants are encouraged to do as much as possible independently. Cueing is used as needed, however active involvement in the session is vital to improvement. The idea is to have the participant engage in cognitive activity that is sufficiently challenging to stimulate cognitive processing but not frustration. Principle: active engagement and treatment fidelity.

13. Praise is given freely. This feedback is very important because praise is a reward. Principle: feedback and praise.

14. Participants are encouraged/motivated throughout the session. For example: “You are doing well. Keep going!” Principle: verbal encouragement and motivation.

15. The activity should be fun and interesting. The interventionists should demonstrate enjoyment by his/her verbal and non-verbal communication. Principle: verbal encouragement and motivation

16. The interventionist ends the session by thanking the participant for his/her time and for an enjoyable afternoon. Principle: motivation and proper communication technique.

17. The time on task, level of participation and the activities attempted are recorded on the Engagement Rating Form. Principle: treatment fidelity

18. If for any reason the intervention was not implemented according to protocol, a Protocol Deviation Form is completed and the reason(s) for protocol deviation are indicated. Principle: treatment fidelity.

Conclusion

We are testing a novel non-pharmacological intervention for delirium in persons with dementia that, to our knowledge, has not been tested before in this population. Our intervention targets underlying cognitive problems, such as inattention, that are present in delirium regardless of cause. In this regard, the intervention has the potential to compliment other approaches to delirium resolution. We are encouraged by our pilot work on the development of this intervention [28] and are undertaking a larger project to improve care for people with dementia who suffer the devastating effects of delirium. We are sharing our practical protocol in the hope that it will be replicated and improved in other studies.

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Table 1

Activities By Cognitive Domain and Level of Difficulty

ATTENTION
EASY Recite the alphabet to the letter “L”
MODERATE Dot to Dot: connect numbers or letters in sequence
DIFFICULT Find the Differences: show two similar pictures and identify the difference
ORIENTATION
EASY Game of “Where am I?” Describe general places (Big city, the beach etc. Example: I am in a place that has tall buildings, a lot of traffic and noise. Where am I? (Big City)
MODERATE Calendar work: have participant identify month selected, how many days, weeks, holidays in the month
DIFFICULT Discuss current events from Newspaper
MEMORY
EASY “Finish the Phrase” cards- use well known phrases. Ex: begin the phrase “ A stitch in time” … allow the participant finish the phrase.. “ saves nine”
MODERATE Identify famous faces (movie stars, historical figures from pictures and books)
DIFFICULT “Memory Tray”-show a tray of 5 items familiar to the participant for one minute. Ask participant to write down as many as possible from memory
ABSTRACT THINKING
EASY Fanfare cards- pick a category & have participant turn over each card & see if it belongs in the category- if it does, keep face up- if not return face down on table.
MODERATE Challenge List: Things that can Fly, Things that are invisible… Ex: Ask participant to name 3 things that can fly [a bird, a plane, a bee]. Name 3 girls names, 3 tools or kitchen gadgets etc.
DIFFICULT “Price is Right” game- Ask participant to arrange items (food, tools, etc.) in order of price. Ex: Place a box of noodles, a jar of Peanut Butter and a can of Coffee in front of the participant. Ask participant to put the items in order from lowest price to highest.
EXECUTIVE FUNCTIONING
EASY Sort items by color/shape. Use foam or wood block shapes
MODERATE Calculate change for a purchase
DIFFICULT Game of “Hangman”
Activity Resources

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