Online Case-Based Education Improves the Recognition of Risk Factors for and Treatment of NOH

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Introduction

Neurogenic orthostatic hypotension (NOH) refers to the significant drop in blood pressure (BP) upon standing (≥20 mmHg systolic BP or ≥10 mmHg diastolic BP within 3 minutes of standing) that results from dysfunction of the sympathetic nervous system. The primary consequences of this condition are dizziness, syncope, weakness, fatigue, and cognitive changes. It is a common feature of Parkinson disease, but it also occurs as a result of autonomic failure by itself, autonomic neuropathy in diabetes, or dopamine beta hydroxylase deficiency. The lack of management guidelines, varying terminology, differing management opinions, and lack of established categories for the various manifestations of this condition may lead to the underdiagnosis and undertreatment of NOH. The current study was undertaken to determine if an online, case-based intervention could effectively improve clinician knowledge of NOH risk factors and treatment strategies.

Methods

Instructional Design: Text-Based Interactive Case

This 5000-word, interactive, text-based CME activity included 2 patient cases that offered detailed scenarios and posed questions exploring the learner’s baseline knowledge regarding the diagnosis and management of NOH. Learners were prompted to determine the appropriate diagnosis and treatment plan for each patient. After each determination, a carefully detailed, fully referenced explanation of the most appropriate determination was presented. By combining a case-based format with 4 to 6 questions per case, this format tests the learner’s level of understanding for each question and “teaches” by correcting or reinforcing existing knowledge. Data were collected between March 16, 2015, and May 18, 2015.

Assessment of Educational Effectiveness

The effects of the education were assessed using a matched pre-assessment/post-assessment study design activity.

- Individual learners’ paired responses to 4 questions before exposure to educational content (pre-assessment measurement) were compared with the same learners’ responses to the same questions posed after the educational content (post-assessment measurement). In this way, each learner served as his or her own control (Figure 1).
- Only learners who answered every pre- and post-assessment question were included in the analysis.

A paired, 2-tailed t-test was used to assess whether the mean pre-assessment score was different from the mean post-assessment score.

- Pearson’s χ² statistic was used to measure changes in response to individual questions.
- P-values were calculated for both t-test and χ² statistics to determine significance. P-values <.05 were considered statistically significant.

The effect size (Cohen’s d) was calculated by comparing pre-assessment means and post-assessment means of matched learners.

Results

Participation in the intervention resulted in a significant improvement for both neurologists (n=387; p<.05; Figure 2A) and cardiologists (n=65; p<.05; Figure 2B) regarding the diagnosis and treatment of NOH. Specific areas of improvement (p<.05 for all comparisons) included:

- Diagnostic procedure to identify factors that worsen NOH in specific patients: Neurologist: 8% relative pre-vs post-education improvement (Figure 3A)
  Cardiologist: 22% relative pre-vs post-education improvement (Figure 3B)
- Nonpharmacologic therapies that can improve symptoms of NOH: Neurologist: 166% relative pre-vs post-education improvement (Figure 4A)
  Cardiologist: 119% relative pre-vs post-education improvement (Figure 4B)
- Initial treatment choice for patients with supine hypertension: Neurologist: 25% relative pre-vs post-education improvement (Figure 5A)
  Cardiologist: 14% relative pre-vs post-education improvement (Figure 5B)
- Appropriate dosing of droxidopa for the treatment of NOH: Neurologist: 27% relative pre-vs post-education improvement (Figure 6A)
  Cardiologist: 44% relative pre-vs post-education improvement (Figure 6B)

An improvement, though not statistically significant (4%, p=.09), was seen for cardiologists regarding the initial selection of treatment for supine hypertension. (Table 5).

Conclusions

Neurologists and cardiologists who participated in this intervention improved their knowledge of the diagnosis and management of NOH, demonstrating the success of an online, text-based, case-focused educational format. Neurologists and cardiologists were most familiar with tools that are used to identify symptoms necessary for the diagnosis of NOH. The largest gain in knowledge for both audiences addressed nonpharmacologic treatment of NOH. Neurologists and cardiologists would benefit from additional education on the treatment of NOH.

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References