IMPROVING MANAGEMENT OF SHORT BOWEL SYNDROME THROUGH SIMULATION-BASED EDUCATION

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STUDY OBJECTIVES

Short bowel syndrome (SBS) is a condition in which bowel absorptive capacity is compromised and is associated with a significantly reduced mucosal surface and inability to maintain energy, fluid, electrolyte, or micronutrient balance through a conventional normal diet. [1] SBS is common after extensive surgical section when residual bowel function does not allow for adequate nutrition. [2] Despite recent advances in SBS management, related guidelines have not been updated in nearly a decade, challenging clinicians to remain current in their management. In fact, results from a recent Medscape Education Survey reveal that clinicians (n = 515) caring for patients with SBS are unfamiliar with many of the medical and surgical methods for improving surgical absorption and adaptation: [3]

- 51% are unfamiliar with intestinal transplantation
- 48% are unfamiliar with glucose polymer-based oral rehydration salts
- 46% are unfamiliar with GLP-2 analogues
- 42% are unfamiliar with growth factors

This study aimed to determine if online medical simulation-based education could improve knowledge and competence of gastroenterologists making clinical decisions in the management of SBS. [4]

References

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2. Seidner DL, Schwartz LK, Winkler MF, Jeejeebhoy K, Boullata JI, Tappenden KA. Increased intestinal absorption in the era of teduglutide and its impact on management strategies in patients with short bowel syndrome-associated intestinal failure. J Parenter Enteral Nutr. 2013;37:201-11.
3. Medscape Education Survey. Management of SBS: 2013 Update [.pdf file]. SurveyMonkey.com. September 2013. Accessed March 30, 2015.
4. Kirby DF, Seidner DL. Optimizing Treatment of Short Bowel Syndrome: A Case-based Approach. October 30, 2014. http://www.medscape.org/viewarticle/833427. Accessed May 25, 2015.

METHODS

Instructional Method:

- The instructional method consisted of an online CME activity delivered via MedSims, a virtual simulation-based learning platform.
- Physicians were presented with two patient cases of SBS matching the scope and depth of actual practice, including their electronic health records (Figure 1; Figure 2).
- MedSims is a virtual patient simulation tool that offers the clinician lifelike, point-of-care interactions through complete freedom of choice in clinical decision-making when presented a complex patient case. Reference drug and testing databases to support these decisions is timely and accurate, enhancing the realism of the experience. [4]
- The MedSims platform is built on a base of artificial intelligence that takes the user's choices or lack thereof and provides mentoring feedback after those choices are made, helping to close the learner's knowledge or behavior gaps.
- The CME activity and related patient cases were designed to address current barriers in SBS such as patient monitoring/assessment for optimization of nutritional adaptation, selection of appropriate pharmacologic therapy as part of intestinal rehabilitation, and implementation of strategies to help improve patient adherence with dietary and nutritional requirements.
- The activity was hosted on Medscape Education from October 30th, 2014 and data were collected through to February 17th, 2015. [4]

Assessment Method:

- Following virtual introduction of patients, physicians were asked to select from numerous available assessments, strategies for patient dietary adherence, and pharmacologic therapies (Figure 1; Figure 2).
- The clinical decisions made by the participants were analyzed using artificial intelligence technology and clinical guidance (CG) was provided employing current evidence-based recommendations through a decision engine in the simulation.
- Impact of the education was measured by comparing participant decisions pre- and post-CG using a 2-tailed paired T-test where *P*<0.05 was considered statistically significant.

RESULTS

Patient case 1: From pre- to post-CG in the simulation, gastroenterologists (n=200) were more likely to make evidence-based clinical decisions related to:

- Applying patient monitoring/assessment strategies to optimize nutritional adaptation in patients with SBS such as ordering colonoscopy (34% pre-CG to 51% post-CG, P<0.001), ordering methylmalonic acid, serum (29% pre-CG to 46% post-CG, P<0.001), ordering upper gastrointestinal series (25% pre-CG to 42% post-CG, P<0.001), and diagnosing small intestine bacterial overgrowth (14% pre-CG to 47% post-CG, P<0.001) (Figure 1; Figure 1B).
- Selecting appropriate pharmacologic therapy, such as teduglutide, as part of intestinal rehabilitation in SBS (1% pre-CG to 36% improvement post-CG, P<0.001) (Figure 1; Figure 1C).
- Implementing strategies, such as registered dietician referral, to improve patient adherence with dietary/nutritional requirements (38% pre-CG vs 53% post-CG, P<0.001) (Figure 1; Figure 1C).

Patient case 2: From pre- to post-CG in the simulation, gastroenterologists (n=186) were more likely to make evidence-based clinical decisions related to:

- Applying patient monitoring/assessment strategies to optimize nutritional adaptation in patients with SBS such as ordering colonoscopy (42% pre-CG to 53% post-CG, P<0.008), ordering methylmalonic acid, serum (34% pre-CG to 48% post-CG, P<0.003), ordering upper gastrointestinal series (35% pre-CG to 46% post-CG, P<0.013), and ordering plasma citrulline (41% pre-CG to 54% post-CG, P<0.008) (Figure 2; Figure 2B).
- Selecting appropriate pharmacologic therapy, such as teduglutide, as part of intestinal rehabilitation in SBS (1% pre-CG to 34% improvement post-CG, P<0.001) (Figure 2; Figure 2C).
- Implementing strategies, such as registered dietician referral, to improve patient adherence with dietary/nutritional requirements (38% pre-CG vs 54% post-CG, P<0.001) (Figure 2; Figure 2C).

FIGURE 1. Patient Case 1

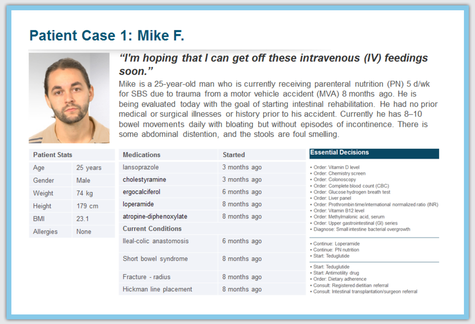


FIGURE 1. Patient Case 2

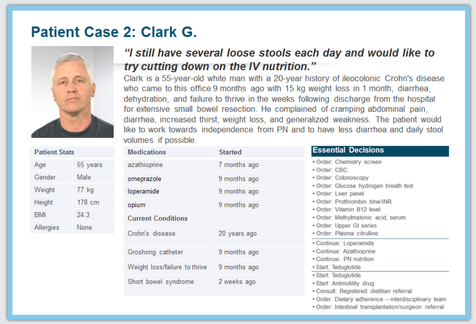


Figure 1B. Patient Case 1 Assessment Decisions

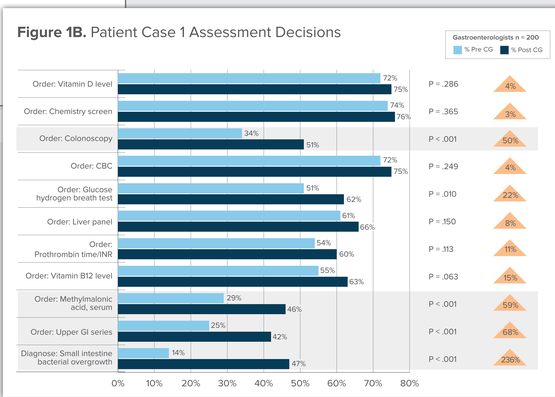


Figure 1C. Patient Case 1 Management Decisions

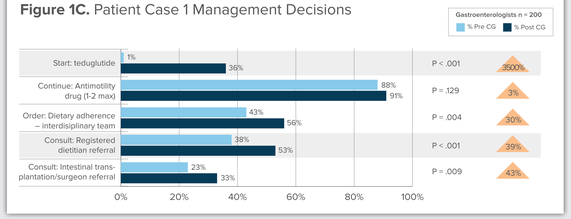


Figure 2B. Patient Case 2 Assessment Decisions

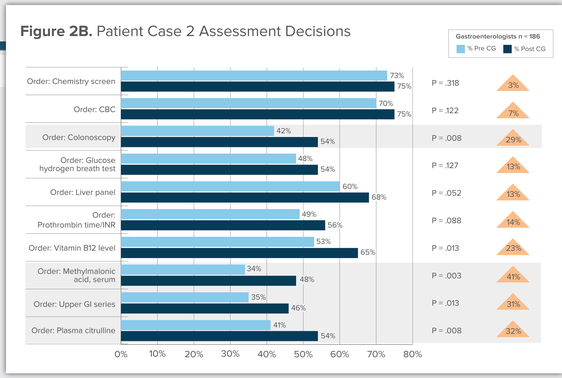
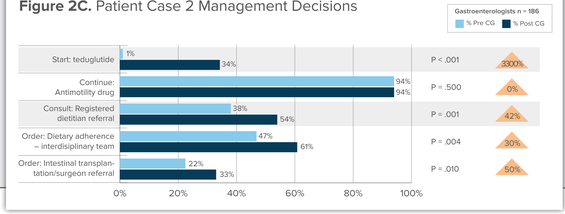


Figure 2C. Patient Case 2 Management Decisions



CONCLUSIONS

Gastroenterologists who participated in online medical simulation-based education significantly improved their clinical decision-making in SBS management. Further education to bolster evidence-based clinical decisions in SBS related to patient assessment, optimization of nutritional adaptation, and managing patient expectations/goals could be delivered in similar consequence-free medical simulation formats to improve gastroenterologists' knowledge and competence and lead to optimized patient outcomes.

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