EFFECT OF SIMULATION-BASED MEDICAL EDUCATION ON IMPROVING SURGEONS’ MANAGEMENT OF SHORT BOWEL SYNDROME

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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. SBS is a common after extensive surgical section when residual bowel function does not allow for adequate nutrition. Despite recent advances in SBS management, related guidelines have not been updated in nearly a decade, challenging clinicians to remain current in their management. This study assessed the impact of online medical simulation-based education could improve knowledge and competence of surgeons making clinical decisions in the management of SBS.

**METHODS**

- A CME activity was delivered online via MedSims, a virtual simulation learning platform that offers clinicians lifelike, point-of-care interactions through a complete freedom of choice in clinical decision making, along with mentoring feedback to improve the learner's knowledge gaps.
- Surgeons were presented with two patient cases of SBS designed to address current barriers such as patient monitoring/assessment for optimization of nutritional adaptation, selection of appropriate pharmacologic therapy, as part of intestinal rehabilitation, and strategies to help patient adherence with dietary/nutritional strategies to optimize nutritional adaptation to improve patient outcomes.
- Following virtual introduction of patients, physicians were asked to select from numerous available assessments, strategies for patient dietary adherence, and pharmacologic therapies. The clinical decisions made by the participants were analyzed using artificial intelligence technology. Clinical guidance (CG) was provided employing current evidence-based recommendations through a decision engine in the simulation.
- Immediate feedback was given to each participant based on the clinical care provided in the simulation.

**RESULTS**

**Patient case 1:** From pre- to post-CG in the simulation, surgeons (n=159) 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 (19% pre-CG to 35% post-CG, P < .001), ordering methylmalonic acid, serum (25% pre-CG to 33% post-CG, P < .001), ordering upper gastrointestinal series (19% pre-CG to 37% post-CG, P < .001), and diagnosing small-intestinal bacterial overgrowth (4% pre-CG to 36% post-CG, P < .001) (Figure 1; Figure 1B).
- Selecting appropriate pharmacologic therapy, such as teduglutide, as part of intestinal rehabilitation in SBS (1% pre-CG to 32% improvement post-CG, P < .001) (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 methylmalonic acid, serum (25% pre-CG to 37% post-CG, P < .001), ordering upper gastrointestinal series (22% pre-CG to 33% post-CG, P < .011), and ordering plasma citrulline (25% pre-CG to 45% post-CG, P < .04) (Figure 2; Figure 2B).
- Selecting appropriate pharmacologic therapy, such as teduglutide, as part of intestinal rehabilitation in SBS (1% pre-CG to 37% improvement post-CG, P < .001) (Figure 2C).

**CONCLUSIONS**

Surgeons who participated in online medical simulation-based education significantly improved their clinical decision making in SBS management, including ordering appropriate tests and selecting treatments to support intestinal rehabilitation. Further education is needed to reinforce these principles as well as optimize nutritional adaptation to improve patient outcomes.

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**References**