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EDITORIAL VIEW

ERAS in neurosurgery: a fad or the future?

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ABSTRACT

Enhanced Recovery After Surgery (ERAS) is being increasingly recognized as a potential protocol to improve patient outcomes. Several specialties have investigated the utility of this protocol and have implemented it in its various forms. However, the role of ERAS in neurosurgery remains elusive. Herein, the author presents the argument for and against the implementation of ERAS protocol in neurosurgical patients.

Key words: ERAS; Neurosurgery; Brain tumors; Spine surgery

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Enhanced Recovery After Surgery (ERAS) as a protocol was introduced in 2002 for patients undergoing colorectal surgery.[1] The philosophy made sense and based on encouraging reports from a number of centers, ERAS continued to grow in popularity. Today, the usefulness of ERAS has been firmly established for a number of surgical procedures.[2,3] ERAS is in essence, a multidisciplinary effort to accelerate post-operative recovery, and thereby improve outcomes, decrease post-operative complications, decrease length of hospital stay, all contributing to reduced cost that greatly exceeds the cost required for its implementation.[4] It involves various interventions, which can be pre-operative, intra-operative or post-operative; and generally focuses around better pain control, maintenance of normal physiology, early ambulation, and avoidance of post-operative complications. All of these interventions are based on available, carefully vetted evidence; although at times the quality of evidence may vary in various interventions. The success of this approach is greatly facilitated by well-informed patients, and an aggressive, outcome driven, team effort. In short, ERAS can be described as a holistic management protocol for surgical patients, based on best available evidence for that particular specialty and procedure.

Although several specialties have already embraced ERAS, its usefulness for neurosurgical patients remained unexplored, and it is only recently that ERAS is being mentioned in neurosurgical literature. Neurosurgical patients broadly comprise of those undergoing cranial procedures, and those undergoing spine procedures. There have been many reports that patient undergoing spine procedures may benefit from such a protocol, but its use for patients undergoing cranial procedures remains elusive.[5,6] There are only a few papers that have attempted to explore the role of ERAS for cranial surgeries and here we would mention two of these, which greatly complement each other. Hagan et al. in 2016 published an extensive literature review, proposing key ERAS components applicable to elective craniotomies based on evidence from neurosurgical literature, as well as from literature related to other surgical specialties where applicable.[7] They used the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system to assess evidence level and published recommendation grades for 22 ERAS items. They further selected 17 of these items to form a preliminary protocol. Some of these items had moderate to high level of evidence supporting their implementation, and were highly recommended. These included pre-operative smoking cessation, use of graduated compression stockings, antibiotic

prophylaxis, intra-operative scalp blocks, anesthesia protocol with TIVA, non-narcotic analgesics, antiemetic prophylaxis with dexamethasone and serotonin antagonists, early removal of urinary catheters, early mobilization, and hypothermia prevention. Others, with either low evidence levels or weak recommendation grades included pre-operative carbohydrate loading, minimized scalp shaving, and post-operative fluid balance. The data regarding the use of minimally invasive surgical procedures was found inconclusive.[7] Interestingly, regular audits for patient compliance also had high level of evidence supporting it, and was highly recommended by the authors.[7]

Based on recommendations of Hagan et al., Wang et al. carried out the first randomized controlled trial to test the feasibility and safety of a neurosurgical ERAS program, enrolling 140 patients randomized to either the ERAS or control group. The methodology may be questionable, as it can be difficult to justify a control group when implementing practices that are strongly supported by best available evidence. Nevertheless, the RCT is well conducted and equally well reported. The primary endpoint was length of hospital stay, and secondary endpoints were peri-operative complications, post-operative pain scores, post-operative nausea and vomiting, post-operative morbidity, duration of urinary catheterization, time to first solid meal, and patient satisfaction. The results strongly favored the use of ERAS protocol, reducing the hospital stay from 7 days to just 3 days, with no difference in complications or readmission rates.[8] Here it must be mentioned that the sample size might be too small to reliably differentiate between post-operative morbidity between the two groups, but despite this limitation, the results are encouraging.

Despite very little specialty-specific data to support it, the larger body of evidence available for non-neurosurgical patients, and the few papers available for neurosurgical patients; clearly suggest that the implementation of ERAS for neurosurgical procedures can be useful in improving at least some aspects of patient care.

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