

Preoperative Distress Factors Predicting Postoperative Pain in Adolescents Undergoing Surgery: A Preliminary Study

Catherine E. Ferland, PhD, Neil Saran, MD, MSc, Teresa Valois, MD, Sheila Bote, BSc, Jill M. Chorney, PhD, Laura S. Stone, PhD, & Jean A. Ouellet, MD

ABSTRACT

The purpose of this study was to determine if preoperative distress factors could be used as predictors of postoperative pain in adolescents scheduled for spinal fusion surgery. Patients reporting the presence of pain before surgery reported greater pain intensity at postoperative day (POD)

1 ($p = .033$), POD 2 ($p = .008$) and at follow-up 6 weeks after surgery ($p = .0001$). Preoperative trait anxiety was associated with pain intensity before surgery ($p = .002$) but not with postoperative pain intensity ($p > .05$). Salivary cortisol concentrations did not differentiate between anxious and nonanxious patients based on anxiety trait ($p = .21$) and

Catherine E. Ferland, Postdoctoral Fellow, Shriners Hospital for Children–Canada; Department of Surgery, McGill University; McGill Scoliosis & Spine Research Group; Alan Edwards Centre for Research on Pain, McGill University; and Faculty of Dentistry, McGill University, Montreal, Canada.

Neil Saran, Orthopedic Surgeon, Shriners Hospital for Children–Canada; Department of Surgery, McGill University; McGill Scoliosis & Spine Research Group; and McGill University Health Centre, Montreal, Canada.

Teresa Valois, Anesthesiologist, McGill University Health Centre, Montreal, Canada.

Sheila Bote, Research Nurse, Shriners Hospital for Children–Canada; and McGill Scoliosis & Spine Research Group, Montreal, Canada.

Jill M. Chorney, Child Psychologist, IWK Health Centre, Halifax, Canada.

Laura S. Stone, Associate Professor, McGill Scoliosis & Spine Research Group; Alan Edwards Centre for Research on Pain, McGill University; Department of Anesthesia, McGill University; Department of Pharmacology and Therapeutics, McGill University; and Faculty of Dentistry, McGill University, Montreal, Canada.

Jean A. Ouellet, Orthopedic Surgeon, Shriners Hospital for Children–Canada; Department of Surgery, McGill University;

McGill Scoliosis & Spine Research Group; Alan Edwards Centre for Research on Pain, McGill University; and McGill University Health Centre, Montreal, Canada.

Financial support provided by the Louise and Alan Edwards Foundation (to JAO, CEF and LSS), the Canadian Institutes of Health Research (MOP126046 to LSS and CEF, MOP102586 to LSS, and MOP192333 to JMC and JAO), and the Shriners Hospitals (CAN84292 to JAO and CEF). CEF received fellowships from the CIHR-NeuroInflammation training program, the Quebec Network for Oral and Bone Health, les Fonds de Recherche du Québec-Santé, and the Shriners Hospitals for Children.

JAO has received lecture fees and funding from DePuy Synthes, Zuchwil, Switzerland. None of the other authors has conflicts of interest to report.

Correspondence: Catherine E. Ferland, PhD, Shriners Hospital for Children–Canada, 1003, Boulevard Décarie, Montreal, H4A 0A9, Canada; e-mail: cferland@shriners.mcgill.ca.

0891-5245/\$36.00

Copyright © 2016 by the National Association of Pediatric Nurse Practitioners. Published by Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.pedhc.2015.12.008>

was not associated with postoperative pain intensity ($p > .05$). These findings suggest that preoperative distress factors do not predict postoperative pain intensity in the acute and intermediate period. The presence of preoperative pain was the best predictor of postoperative pain intensity, suggesting that preoperative pain assessment will identify patients at an elevated risk for intense postoperative pain. *J Pediatr Health Care.* (2016) ■, ■-■.

KEY WORDS

Perioperative pain, anxiety, salivary cortisol, adolescent idiopathic scoliosis

In Canada, about 65,000 children and adolescents undergo surgery each year (Wright & Menaker, 2011). Postoperative pain is a major concern for patients undergoing major orthopedic surgery (Sjoling, Nordahl, Olofsson, & Asplund, 2003). Significant postoperative pain has been shown to negatively influence outcomes such as hindering the healing process, delaying physical rehabilitation, and loss of motion and ambulation (Carr & Goudas, 1999).

The role of stress in pain processing was recognized years ago (Melzack, 1986). Several studies have reported the influence of the preoperative psychological status of adolescents on postoperative outcomes such as pain (Gil, Ginsberg, Muir, Sullivan, & Williams, 1992; LaMontagne, Hepworth, Cohen, & Salisbury, 2003; Logan & Rose, 2005) and recovery (Fortier, Martin, Chorney, Mayes, & Kain, 2011; Podeszwa, Richard, Nguyen, De La Rocha, & Shapiro, 2015). These findings have suggested that the preoperative psychological profile of patients using self-reported questionnaires is of great clinical value in predicting the postoperative outcome. However, a proportion of pediatric orthopedic patients scheduled for major elective surgery are unable to self-report or communicate their distress or pain because of developmental disabilities. Therefore, the applicability of a physiological measure such as cortisol that could quantify distress level and or predict postoperative pain intensity could benefit these patients tremendously.

Physiologically, stress is intimately associated with the hypothalamic-pituitary-adrenal axis, with the hormone cortisol being an end product (Kirschbaum & Hellhammer, 1989; Levine, Zagoory-Sharon, Feldman, Lewis, & Weller, 2007). Measurement of salivary cortisol has been widely used in stress-response research as a biomarker of stress (Dorn et al., 2003; Hellhammer, Wust, & Kudielka, 2009; Keil, 2012; Patil et al., 2015; Wennstrom, Tornhage, Nasic, Hedelin, & Bergh, 2011). The apprehension (psychogenic stress) of physical harm is a potent stimulus of cortisol secretion (Kirschbaum & Hellhammer, 1994). Several studies have successfully measured cortisol levels in newborns to assess pain-related procedural stress (Brummelte et al., 2015; Grunau et al., 2005; Grunau

et al., 2010). In addition, a relationship between salivary cortisol and stress was demonstrated previously in children with recurrent abdominal pain (Dorn et al., 2003). In older children, cortisol has been studied in dentistry, with changes in salivary cortisol levels being measured during various dental procedures (Furlan, Gaviao, Barbosa, Nicolau, & Castelo, 2012; Patil et al., 2015; Rodrigues Gomes, Barreto Bezerra, & Maia Prado, 2013).

Rosen and Schulkin (1998) stated that anxious individuals with a baseline susceptibility or a proneness to state anxiety—that is, trait anxiety (Spielberger, 1983)—are likely to experience elevated cortisol levels in response to anticipated stress (Rosen & Schulkin, 1998). Increases in salivary cortisol concentrations may be observed not only with an acute stressor but also in anticipation of a stressful upcoming experience such as a scheduled surgery (Bodley, Jones, & Mather, 1974; Hill & Walker, 2001). In the perioperative period surrounding elective surgery, cortisol has been related to the postoperative stress response (Wennstrom et al., 2011). However, little is known about the relationship between perioperative cortisol levels and postoperative pain. Recently, it was shown that in an experimental setting, young adult participants with higher cortisol levels were more sensitive to painful stimuli than were participants with lower cortisol levels (Choi, Chung, & Lee, 2012), suggesting an association between cortisol and pain sensitivity. Taken together, these findings raise the possibility that salivary cortisol could be used to predict pain intensity in the clinical context of a surgical procedure. Although previous studies have shown positive associations between subjective psychological and endocrine stress responses (Schlotz et al., 2008), physiological stress-response associated with the patient's preoperative anxiety has not been thoroughly explored before in regard to postoperative pain in adolescents.

The goals of this study were to understand the relationship between psychological and physiological dimensions of distress with self-reported pain intensity before a surgical procedure and to assess their relationships with postoperative pain intensity. This study was designed with a cohort of patients with Adolescent Idiopathic Scoliosis (AIS), a condition in which the spine is rotated into a complex three-dimensional deformity. Severe curves ($> 50^\circ$) are generally treated with a spinal fusion and instrumentation, which is a very painful surgery for children/adolescents, and attention has been directed to management of this pain in the hospital (Borgeat & Blumenthal, 2008; Bridwell, 1999). While controlling for the type of surgery and using a standardized anesthetic protocol to minimize potential confounding variables, the relationship of preoperative psychological anxiety, physiological distress (salivary cortisol level), and preoperative pain to postoperative pain was evaluated. It was first

Download English Version:

<https://daneshyari.com/en/article/5569937>

Download Persian Version:

<https://daneshyari.com/article/5569937>

[Daneshyari.com](https://daneshyari.com)