

Editorial

Nonoperative care to manage the sacroiliac joint

CHRISTOPHER I. SHAFFREY, M.D.,
AND JUSTIN S. SMITH, M.D., PH.D.

Department of Neurosurgery, University of Virginia Health System, Charlottesville Virginia

Low-back pain and pain involving the area of the posterior iliac spine are extremely common. Degeneration of the sacroiliac (SI) joint is a potential cause for low-back pain and pain radiating into the groin or buttocks. Recent studies have demonstrated an increased incidence of SI joint arthritis as a cause of chronic low-back pain compared with conditions such as internal disc disruption in the aging population.² Degenerative changes to the lumbar spine and SI joints are common. A recent study evaluating SI joint abnormalities in a primary low-back pain population demonstrated that 31.7% of patients had SI joint abnormalities.⁸ Another study demonstrated a frequent coexistence of spine and SI joint pathology.⁹ Controversy exists about the best methods of differentiating between the pain caused by internal disc disruption, SI joint pathology, or facet joint degeneration as the source of low-back pain.⁵ A recent systematic review performed to determine the diagnostic accuracy of tests available to clinicians to identify the disc, facet joint, or SI joint as the source of low-back pain concluded that tests do exist that change the probability of the disc or SI joint (but not the facet joint) as the source of low-back pain.⁵ It was also concluded that the usefulness of these tests in clinical practice, particularly for guiding treatment selection, remains unclear and that the evaluation and management of isolated low-back pain and the role for surgical intervention in suspected SI joint pain continue to be very controversial.

Many nonoperative and operative strategies for the management of low-back pain have not proved to be consistently effective.⁶ Despite the frequent lack of efficacy, the economic cost to society for the management of low-back pain is substantial.⁴ A recent analysis of Medicare utilization trends and Medicare expenditures found that recipients receiving spinal interventional techniques increased 107.8% from 2000 through 2008, an average annual increase of 9.6%.⁷ Payments for epidural steroid injections and facet joint and SI joint interventions were approximately \$362 million in 2000 and \$1.231 billion in

2008, representing an average annual increase of 16.5%.⁷ In particular, the number of diagnostic and therapeutic interventions used for the evaluation and treatment of SI joint conditions has exploded. The number of SI joint interventions increased from 46,940 in 2000 to 231,800 in 2008, an increase of nearly 500%.⁷

“Nonoperative care to manage sacroiliac joint disruption and degenerative sacroiliitis: high costs and medical resource utilization in the United States Medicare population” by Ackerman and colleagues is a retrospective study that explores medical resource use and associated Medicare reimbursement for patients managed with nonoperative care for degenerative sacroiliitis or SI joint disruption. The authors found that the mean cumulative 5-year direct medical costs attributable to management of the SI joint pathology were \$18,527, with the 5-year Medicare reimbursement being \$270 million for 14,552 Medicare beneficiaries.¹ Their conclusions are valid, that the economic burden of SI joint disruption and degenerative sacroiliitis among Medicare beneficiaries in the US is substantial and that more cost-effective therapies to treat this condition and reduce health care expenditures are needed.¹

The limitations of this article are detailed in their *Discussion* section. Using the Medicare 5% Standard Analytic Files to identify patients with SI joint pathology inherently has the potential for inaccuracy due to miscoding. Some practitioners treating these patients are primary care providers and may not have performed the appropriate clinical, radiographic, and diagnostic examinations to appropriately diagnose SI joint pathology. Even though an exploratory analysis was performed showing that 75% of claims came from a relevant provider specialty, SI joint pathology is frequently either misdiagnosed or miscoded.³ Including only patients with an ICD-9-CM code for degenerative sacroiliitis/SI joint disruption in the primary diagnosis position likely reduces this inaccuracy as much as possible in this type of database analysis. There is likely also some inaccuracy in the true diagnosis in those patients with degenerative sacroiliitis/SI joint disruption who underwent lumbar spinal fusion surgery. The message that lumbar fusion surgery markedly increases the cost of management of this patient population is valuable.

This study was sponsored by SI-BONE, Inc., and 2 of the authors are consultants to SI-BONE through their employment at Covance.¹ There is always a concern about potential conflict of interest with any study that could potentially influence patient management strategies. This study focuses on the costliness and high resource utilization of nonoperative management of SI joint pathology.

Although it is true that nonoperative management of this condition is costly, it is almost certain that operative management of degenerative sacroiliitis/SI joint disruption would be even more costly and require substantially more resource utilization. A recent systematic review found improvement regardless of the treatment, with most studies reporting over 40% improvement in pain as measured by visual analog scale or numeric rating scale scores.¹⁰ This review also noted that, despite improvements in reported pain, fewer than half of the patients who had work status reported returned to work.¹⁰

This article makes a valuable contribution by demonstrating that nonoperative management of degenerative sacroiliitis/SI joint disruption is costly. Without prospective trials with nonconflicted practitioners using standardized selection criteria, the true role for nonoperative management strategies and SI joint fusion procedures in the management of chronic low-back pain will remain murky. Much more high-quality information is needed regarding the diagnosis and optimal management of SI joint pathology in order to improve patient outcomes and more effectively utilize health care resources.

(<http://thejns.org/doi/abs/10.3171/2013.9.SPINE13501>)

Disclosure

Dr. Shaffrey is a consultant for Biomet, Globus, Medtronic, NuVasive, and Stryker. He is a patent holder with and receives royalties from Biomet and Medtronic. Dr. Smith is a consultant for Biomet, DePuy, Globus, and Medtronic.

References

- Ackerman SJ, Polly DW Jr, Knight T, Holt T, Cummings J Jr: Nonoperative care to manage sacroiliac joint disruption and degenerative sacroiliitis: high costs and medical resource utilization in the United States Medicare population. Clinical article. *J Neurosurg Spine* [epub ahead of print February 14, 2014]. DOI: 10.3171/2014.1.SPINE13188]
- DePalma MJ, Ketchum JM, Saullo T: What is the source of chronic low back pain and does age play a role? *Pain Med* **2**: 224–233, 2011
- Dreyfuss P, Dreyer SJ, Cole A, Mayo K: Sacroiliac joint pain. *J Am Acad Orthop Surg* **12**:255–265, 2004
- Gore M, Sadosky A, Stacey BR, Tai KS, Leslie D: The burden of chronic low back pain: clinical comorbidities, treatment patterns, and health care costs in usual care settings. *Spine (Phila Pa 1976)* **37**:E668–E677, 2012
- Hancock MJ, Maher CG, Latimer J, Spindler MF, McAuley JH, Laslett M, et al: Systematic review of tests to identify the disc, SIJ or facet joint as the source of low back pain. *Eur Spine J* **16**:1539–1550, 2007
- Karppinen J, Shen FH, Luk KD, Andersson GB, Cheung KM, Samartzis D: Management of degenerative disk disease and chronic low back pain. *Orthop Clin North Am* **42**:513–528, viii, 2011
- Manchikanti L, Pampati V, Falco FJ, Hirsch JA: Growth of spinal interventional pain management techniques: analysis of utilization trends and Medicare expenditures 2000 to 2008. *Spine (Phila Pa 1976)* **38**:157–168, 2013
- O'Shea FD, Boyle E, Salonen DC, Ammendolia C, Peterson C, Hsu W, et al: Inflammatory and degenerative sacroiliac joint disease in a primary back pain cohort. *Arthritis Care Res* **62**:447–454, 2010
- Sembrano JN, Polly DW Jr: How often is low back pain not coming from the back? *Spine (Phila Pa 1976)* **34**:E27–E32, 2009
- Spiker WR, Lawrence BD, Raich AL, Skelly AC, Brodke DS: Surgical versus injection treatment for injection-confirmed chronic sacroiliac joint pain. *Evid Based Spine Care J* **3**:41–53, 2012

Response

STACEY J. ACKERMAN, M.S.E., PH.D.,¹
AND DAVID W. POLLY JR., M.D.²

¹Covance Market Access Services Inc., San Diego, California; and ²Departments of Orthopaedic Surgery and Neurosurgery, University of Minnesota, Minneapolis, Minnesota

We would like to thank Drs. Shaffrey and Smith for their thoughtful and insightful comments about our article. As they point out, the number of SI joint interventions has increased over the past decade as new medical technologies and techniques have been developed.

We agree with Drs. Shaffrey and Smith that identification of patients with SI joint pathology in health insurance claims data is inherently difficult due to the potential for misdiagnosis or miscoding. As with any retrospective claims analysis, the reliance on a coding system to identify patients with a clinical condition may lead to a lack of sensitivity and specificity. As described in the paper, in order to increase the specificity of the cohort identification, only patients with an ICD-9-CM code for degenerative sacroiliitis/SI joint disruption in the primary diagnosis position were selected. This approach, while less sensitive, allowed us more certainty that the patient was seeking care for the SI joint, rather than another condition. Furthermore, to increase the specificity of the claims identification, only those claims attributable to degenerative sacroiliitis/SI joint disruption were selected for analysis, that is, claims with a primary or secondary ICD-9-CM spinal diagnosis code of 71x.xx, 72x.xx, 73x.xx, or 84x.xx. While imperfect, the methods used in this paper are well established and represent best practices for burden of illness research using retrospective claims data whereby ICD-9-CM codes are commonly used to identify patients.^{2,4}

As Drs. Shaffrey and Smith rightfully point out, this study was sponsored by SI-BONE, Inc. As there is little unbiased funding available for this type of work, we have done our best to minimize bias by 1) following established guidelines to minimize conflict of interest in pharmaco-economic studies,³ 2) describing the methods in detail so that the results can be reproduced, 3) clearly detailing conflicts of interest, 4) and involving experts who do not receive any financial support from SI-BONE.

Drs. Shaffrey and Smith suggest that operative management of SI joint disruption/degenerative sacroiliitis would be more costly than nonoperative management. Our analyses to date suggest otherwise when considering lifetime costs among Medicare beneficiaries in the US. Direct medical costs for nonoperative care accumulate steadily over a patient's lifetime, as opposed to the costs associated with operative management such as minimally invasive surgery (MIS) SI joint fusion, which are higher in the 1st year. We developed an economic model to compare the costs of MIS SI joint fusion to nonoperative care

Editorial

for the treatment of SI joint disruption in the Medicare population.¹ The extrapolated lifetime cost of treating Medicare patients with MIS SI joint fusion was \$48,185/patient compared with \$51,543/patient for nonoperative care, resulting in a \$660 million savings to the Medicare program (196,452 beneficiaries at \$3358 in savings/patient) due to reductions in spine-related health care costs over Medicare patients' lifetimes.

Drs. Shaffrey and Smith appropriately emphasize the need to better understand the role of nonoperative management strategies and SI joint fusion procedures in the management of chronic low-back pain through prospective studies with nonconflicted practitioners. Two prospective clinical trials have been initiated to further characterize the safety and effectiveness of MIS SI joint fusion; a large single-arm trial at 27 sites across the US (SIFI: NCT01640353 [<http://clinicaltrials.gov/show/NCT01640353>]) and a randomized controlled trial at 13 sites across the US (INSITE: NCT01681004 [<http://clinicaltrials.gov/show/NCT01681004>]). Outcomes in these studies include improvements in SI joint pain, back dysfunction, quality of life, ambulatory status, and work status. Consequently, the results of these trials will provide important information regarding management of SI joint pathology in an effort to appropriately steward health care resources.

Recent US health care reform legislation focuses on

improving quality of care and reducing costs. The economic burden of SI joint disruption and degenerative sacroiliitis among Medicare beneficiaries in the US is substantial and highlights the need for new therapies to treat this condition and reduce health care expenditures.

References

1. Ackerman SJ, Polly DW, Knight T, Schneider K, Holt T, Cummings J: Comparison of cost of non-operative care to minimally invasive surgery for sacroiliac joint disruption and degenerative sacroiliitis in a United States Medicare population: potential economic implications of a new minimally-invasive technology. **Clinicoecon Outcomes Res** 5:575–587, 2013
2. Gore M, Sadosky A, Stacey BR, Tai KS, Leslie D: The burden of chronic low back pain: clinical comorbidities, treatment patterns, and health care costs in usual care settings. **Spine (Phila Pa 1976)** 37:E668–E677, 2012
3. Graf C, Battisti WP, Bridges D, Bruce-Winkler V, Conaty JM, Ellison JM, et al: Research Methods & Reporting. Good publication practice for communicating company sponsored medical research: the Gpp2 guidelines. **BMJ** 339:b4330, 2009
4. Mehra M, Hill K, Nicholl D, Schadrack J: The burden of chronic low back pain with and without a neuropathic component: a healthcare resource use and cost analysis. **J Med Econ** 15:245–252, 2012

Please include this information when citing this paper: published online February 14, 2014; DOI: 10.3171/2013.9.SPINE13501.