Application of “Less Is More” to Low Back Pain

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An initiative of the National Physicians Alliance, the project titled “Promoting Good Stewardship in Clinical Practice,” developed a list of the top 5 activities in primary care for which changes in practice could lead to higher-quality care and better use of finite clinical resources. One of the top 5 recommendations was “Don’t do imaging for low back pain within the first 6 weeks unless red flags are present.” This article presents data that support this recommendation. We selectively reviewed the literature, including recent reviews, guidelines, and commentaries, on the benefits and risks of routine imaging in low back pain. In particular, we searched PubMed for systematic reviews or meta-analyses published in the past 5 years. We also assessed the cost of spine imaging using data from the National Ambulatory Medical Care Survey. One high-quality systematic review and meta-analysis focused on clinical outcomes in patients with low back pain and found no clinically significant difference in pain or function between those who received immediate lumbar spine imaging vs usual care. Published data also document harms associated with early imaging for low back pain, including patient “labeling,” unneeded follow-up tests for incidental findings, irradiation exposure, unnecessary surgery, and significant cost. Routine imaging should not be pursued in acute low back pain. Not imaging patients with acute low back pain will reduce harms and costs, without affecting clinical outcomes.

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The National Physicians Alliance project titled “Promoting Good Stewardship in Clinical Practice” developed 5-item lists of evidence-based, quality-improving, resource-sparing activities in the fields of family medicine, internal medicine, and pediatrics. Each item is supported by the evidence, benefits patients by improving treatment or decreasing risks, and, where possible, reduces the costs of care.

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METHODS

A detailed description of the methods used to derive the top 5 lists is given elsewhere. The full item discussed herein for internal medicine was...
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wordsed as follows: “Don’t do imaging for low back pain within the first 6 weeks unless red flags are present.” Red flags were defined as “severe or progressive neurological deficits” or serious underlying conditions, such as cancer or osteomyelitis.

We searched the recent literature for population-based estimates of the incidence of acute low-back pain, the frequency of physician visits for this problem, and the use of imaging. To document the potential benefits and risks of routine imaging for acute low-back pain, we searched the literature using PubMed for articles published in the past 5 years using the terms lower back pain, low back pain, imaging, and either systematic review or meta-analysis. We also assessed the cost of spine imaging using data from the National Ambulatory Medical Care Survey and used estimates of the prevalence of imaging for low back pain to arrive at an estimate of the number of patients receiving such imaging in 1 year. Thereafter, we used 2009 Medicare reimbursements for lumbar spine imaging to calculate the associated cost savings.

RESULTS

INCIDENCE OF LOW BACK PAIN AND IMAGING

Low back pain has a lifetime prevalence of approximately 80% and is the fifth most common reason for all physician visits in the United States. Approximately one-quarter of US adults reported having low back pain lasting at least 1 week in the preceding 3 months. Imaging for acute low back pain is common. Recent data show that 42% of patients with back pain receive imaging within 1 year, mostly plain radiography. Of these, 60% had imaging on the same day as the index diagnosis of back pain and 80% within 1 month of the diagnosis. Medicare data indicate that almost one-third of patients identified with the diagnosis code of lumbar pain had diagnostic radiography within 28 days. Although magnetic resonance (MR) imaging and computed tomography (CT) are significantly more costly than standard lumbar radiography, their use as modalities for spinal imaging in low back pain is increasing. For example, Medicare provides far greater reimbursement for MR imaging than for conventional radiography, with a ratio of reimbursement to cost of 2.3 for MR imaging vs 0.9 for conventional radiography. In the case of lumbar spine imaging, between 1994 and 2005 MR imaging covered by Medicare increased 307%.

EVIDENCE OF BENEFIT

Our literature search identified only one systematic review published in the past 5 years that provides data on outcomes related to imaging of acute low back pain. This meta-analysis, by Chou et al., focused on clinical outcomes in patients with acute low back pain and found no clinically significant difference in pain or function between those who received immediate lumbar spine imaging vs usual care. The authors concluded that “lumbar imaging for low back pain without indications of serious underlying conditions does not improve clinical outcomes.”

EVIDENCE OF HARM

More than 85% of patients seen at primary care practices have low back pain that cannot be attributed to a specific disease or an anatomic abnormality, and it is well known that imaging of asymptomatic patients often reveals anatomic abnormalities, such as herniated discs. One of the risks of routinely imaging uncomplicated acute low back pain is patient “labeling”; no evidence exists that labeling patients with low back pain with a specific anatomic diagnosis improves outcomes.

Degenerative disc disease is associated with low back pain, although the strength of the association varies with the definition. In a study of patients with back pain who underwent MR imaging and were then randomized to (1) disclosure of MR imaging findings to the patient and physician or (2) withholding of the findings, patients who were told that the MR imaging showed benign degenerative disc disease had a diminished sense of well-being compared with patients who were not told their MR imaging results.

In another study, patients who underwent lumbar radiography for back pain of at least 6 weeks’ duration reported more pain and worse overall health status after 3 months than those who did not undergo radiography. The patients who underwent imaging also were more likely to seek follow-up care.

The performance of MR imaging for acute low back pain may be associated with deleterious outcomes. In a randomized controlled trial comparing MR imaging with standard lumbar radiography for low back pain, patients in the MR imaging arm of the trial were more than twice as likely to undergo surgical interventions than patients in the lumbar radiography arm (risk difference, 0.34; 95% CI, −0.06 to 0.73).

For work-related acute low back pain, another study found that patients who underwent MR imaging within the first month had more than an 8-fold increased risk for surgery and more than a 5-fold increase in subsequent total medical costs compared with matched control patients who did not undergo early MR imaging. Regions with higher use of advanced imaging for low back pain also have an increased rate of spinal surgical procedures for low back pain; greater use of imaging is not associated with better patient outcomes.

Other risks of routinely imaging patients with acute low back pain include unnecessary irradiation exposure (for lumbar radiography and CT), especially in women, for whom lumbar radiography poses a risk to reproductive health. Based on the performance of 2.2 million lumbar CT investigations in the United States in 2007, a study projected an additional 1200 future cases of cancer.

BALANCE OF BENEFIT AND RISK

High-quality consistent evidence shows that imaging patients with acute low back pain of less than 6 weeks’ duration and no red flag symptoms results in no clinical benefit but is associated with harms, including patient labeling, irradiation exposure, and unnecessary surgery. As already summarized, recent reviews showed no improvement in clinical outcomes associated with immediate imaging. Routinely imaging the low back in this setting provides no benefit to pa-
patients, except perhaps to increase a sense of patient satisfaction with his or her health care.

ESTIMATED COST SAVINGS OF THE GOOD STEWARDSHIP RECOMMENDATION

Based on the following assumptions, we estimated the cost savings that would accrue from avoiding routine imaging of low back pain. We estimated the number of patients in 1 year receiving routine imaging for low back pain based on estimates by Deyo et al\(^7\) that half of all US adults have an episode of acute low back pain during any given year. We also used estimates from the 2008 National Ambulatory Medical Care Survey\(^20\) about the number of patient visits for patient-reported symptoms of back pain. Furthermore, Pham et al\(^21\) found that, among all patients undergoing imaging within 28 days of diagnosis, 11.8% received MR imaging or CT, and 88.2% received lumbar radiography. Figure 2 summarizes the calculations to estimate that 3 802 800 patients receive imaging for routine low back pain in 1 year.

We used 2009 Medicare reimbursements for lumbar spine imaging ($41 for plain radiography, $264 for noncontrast CT, and $439 for noncontrast MR imaging) to calculate the associated cost savings per patient per year.\(^2\) Using the figure in the previous paragraph of approximately 4 million patients, we estimated that following the Good Stewardship recommendation would result in overall savings of $140 million from the elimination of unnecessary lumbar
radiography and between $120 and $200 million from the elimination of unnecessary MR imaging and CT. Using the midpoint of the range of savings for MR imaging or CT ($160 million from eliminating CT/MRI + $140 million from eliminating plain films), we arrived at our final estimate of almost $300 million in annual savings.

The cost savings and estimates discussed herein are based on generalizations about the US population at large and do not consider regional variability or differences in imaging use according to practice size and population. In addition, these estimates ignore the societal cost of imaging, including the morbidity associated with patient labeling or the risk for unnecessary surgery.

COMMENT

CHANGING BEHAVIORS OF PHYSICIANS AS STEWARDS

Ample evidence supports the National Physicians Alliance recommendation that in the absence of red flag symptoms imaging is not warranted in acute low back pain of less than 6 weeks' duration. Similar guidelines that recommend against routine imaging have been in use for almost 3 decades. Nevertheless, a survey of US physicians found that more than one-third would order lumbar MR imaging for uncomplicated acute low back pain if a patient insisted on it even after the physician explained that it was unnecessary.

Reasons why physicians may continue to order imaging for acute low back pain include medicolegal concerns, patient preferences, time pressures (which might make it easier to order an imaging procedure than to discuss the condition), and financial incentives. In randomized controlled trials, patients with low back pain expressed more satisfaction when they received routine lumbar imaging or advanced imaging, although clinical outcomes were not better than those for patients who did not undergo imaging.

How can physicians say no and still maintain the physician-patient relationship, a high level of patient satisfaction, and patient adherence? Physicians are cautious when rejecting patient requests for service, in part because of the perception that saying no to a request may lower patient satisfaction. However, most patients do not want unnecessary or potentially harmful tests, and patient education may bridge this gap.

Evidence has shown that patient agreement with his or her physician can predict important health outcomes. A study, using a specific 3-item instrument in assessing patient agreement with the plan by the physician for his or her low back pain showed that higher agreement scores correlated with increased patient satisfaction and with improvement in measures of health status at 12-month follow-up. Data suggest that validating a patient's diagnosis of low back pain, gathering additional data about the reason the patient is requesting imaging, and providing information tailored to the patient's perspective may result in excellent patient satisfaction, despite denying the request for imaging.

Strategies involving physician education by clinical leaders, audit, and feedback may be effective in reducing inappropriate lumbar imaging. A multifaceted intervention in a health care system reduced the rate of lumbar MR imaging by 23%; this program required clinicians to identify an approved indication before ordering advanced imaging, offered education on appropriate imaging, included periodic audits and feedback, and provided rapid physical therapy and consultation when imaging was not indicated. Computer-based feedback on recent imaging investigations and ordering patterns of peers may also have some influence on the requesting of imaging tests. Some observers have recommended mandatory consultation by a radiologist when physician requests for imaging are inconsistent with guidelines. Effective intervention to reduce inappropriate imaging probably requires multiple simultaneous strategies.

Although physicians are usually loath to bring up the issue of cost in the examination room, today's health care climate may make this topic ripe for discussion. Pearson discusses the need for a shift in the paradigm of physician advocacy to one in which patients and physicians are part of a moral community that controls costs through group deliberation and decision making. An ethical grounding has recently been emphasized by the American College of Physicians, which included such considerations as part of the professional responsibility of physicians. Honesty about cost can ensure patient satisfaction in the delivery of high-quality ethical care.

FINAL THOUGHTS

The “Less Is More” series is focused on areas in which responsible physician stewardship can help improve the quality and reduce the potential harms of care. Physicians should also consider costs, balancing the needs of individuals with those of society at large.

We believe that a thoughtful dispassionate approach to topics in medicine can reveal areas of practice that may have become standards of care but are not necessarily good standards of care. The Good Stewardship Working Group found that collaborative deliberation and decision making, together with a thorough study of the medical literature, can help physicians explain their rationale for evidence-based selective imaging.

Adhering to the Good Stewardship recommendation on low back pain will improve care, reduce harm, and decrease overall medical costs. Ensuring a frank and honest discussion of the benefits and risks of medical therapy and imaging can improve care and reduce costs for patients with low back pain.

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REFERENCES


Are the Top 5 Recommendations Enough to Improve Clinical Practice?

I am not a physician, but I have relevant patient experience. For the past 20 years, I have had no significant back pain. Before that, I had a bad back for 20 years, with almost daily sciatica pain and frequent episodes of a misaligned spine, with crippling muscle spasms. Seeking relief, I visited neurologists, orthopedists, chiropractors, acupuncturists, physical therapists, and finally a physiatrist. The cure came from the mind-body connections offered by my physiatrist. My experience is that curing back pain is complex and that testing often reinforces a bioskeletal problem when there is frequently a large psychological component involved. Is this a case of testing preventing a cure?2 The authors of “Application of ‘Less Is More’ to Low Back Pain”2 in this issue of the Archives refer to this phenomenon as patient “labeling.”

In their article, Srinivas et al2 address the many dimensions of a