



Investigating Relationship Between History and Physical Examination by Indicating MRI in Patients with Low Back Pain in Imam Reza Hospital

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Abstract

Objectives: The primary purpose of this study is to evaluate the use of guidelines or risk factors in patients with LBP by referring clinicians.

Methods: We randomly selected people that referred to the imaging center for lumbar spine MRI during 1 year, January to December 2016. History regarding the back pain and physical examination was taken in patients as well as asked about the parameters of indications for LBP before doing the MRI.

Results: Total patients studied during this year were 710. Sex difference in these patients was 200 male (28.2%) and 510 female (71.8%). The mean age of referred patients was 41.2 years (18 - 90 year). Base on the history of the patients, about 135 patients had at least 1 risk factor that indicated for imaging. During physical examination about 108 patients had at least 1 indication for imaging. Patients in this study were referred from different physicians; most of them were neurosurgeons (479 - 67.5%) and orthopedics (101 - 14.2%).

Conclusions: This study shows that about 75% of cases referred for a MRI didn't have any medical indication for imaging. Apart from results of any low back MRI that might be different from clinical process and cause wrong management, their cost and benefits are very important factor for decision making.

Keywords: Low Back Pain, Diagnostic Imaging, MRI

1. Background

Low back pain is one of the major problems in public health. It affects up to 80% of all the adult population during their life. Understanding the type of pain that the patient expresses is the first step. The identification of risk factors for severe underlying diseases should also be considered. Among people who undergo primary and supportive care due to back pain, most cases recover within 3 months or return to work with low levels of pain and disability. About 10% of cases will be disabled or chronic, which most of the cost of treatment and diagnostic measures is for this group. Governments spend a lot of money on the diagnosis and treatment for low back pain every year (1).

Finding the cause, prevention, and management of low back pain has an important role in reducing the cost of treatment for governments and will lead to quicker returns of patients to their daily careers. Magnetic resonance imaging (MRI) is a valuable diagnostic tool that has be-

come popular since the 1980s. MRI is a non - invasive, non - ionizing method that employs robust magnets and radio waves through the computer technology of two - dimensional and three - dimensional images of the body (2). While the MRI is a highly sensitive and accurate assessment of the spine, it cannot distinguish between painful and non - painful structures in the spine. In fact, a patient may suffer severe low back pain and the MRI is normal or unlikely that the patient may have a little pain, however, the MRI shows a lot of anatomical problems. Thus, MRI findings alone are not diagnostic and should help us to achieve a diagnosis with physical examination and clinical symptoms together. For this reason, early onset of MRI is not recommended at the onset of initial pain, and various papers recommend supportive and therapeutic measures without imaging in the first 6 weeks of onset of back pain unless there are red flags.

These warning signs include a history of cancer, a pain that worsens at night or at rest, a serious trauma and in-

jury, a fever without a specific cause, a history of previous surgery in the low back, prolonged use of corticosteroids, osteoporosis, immunosuppression, Sphincter insufficiency or walking disorders, intravenous drug use, over 70 years of age, and weight loss without any cause. Also, warning signs in the examination include pain in vertebral percussion, abnormal limitation of lumbar spine, presence of mass in the abdomen, rectum or pelvis, and focal neurological impairment (3).

Considering the heavy diagnostic costs for patients and the health care system in the country, it is necessary to review and provide solutions for the removal of unnecessary imaging.

The annual cost of back pain in the United States is more than 100 billion dollars, with almost 1/3 of them spending on direct health care and 2/3 of them indirectly due to reduced working hours and personal productivity (4). Several studies have shown that advanced radiological imaging in patients with or without symptomatic lesions does not improve the results (5). In addition, it has been seen that excessive imaging, such as MRI, has led to increased spinal surgery (6). The American College of Physicians recommends that MRI be performed only in the presence of a progressive neurological disorder, and when there is a suspicion of a serious underlying condition or the need for surgery or epidural corticosteroid injection (7). The American College of Occupational and Environmental Medicine guidelines recommend that MRI be performed only in the presence of focal neurological symptoms that persists for at least 6 weeks and does not improve. MRI in low back pain may not be effective in improving patients, as in imaging studies conducted in asymptomatic volunteers that show a high incidence of abnormal findings (8).

2. Methods

This is a cross-sectional descriptive-analytic study. We included patients with low back pain who had been referred by any physician to Imam Reza Hospital's Imaging Center (AJA University of Medical Sciences) for a low back MRI during 1 year. Any referred patients that asked for details and specificities of his or her back pain, including all related history and were also examined by the rheumatologist for their problem before doing the MRI. All these data were entered in questionnaires specific for any patients. Characters of red flags and the list of indications of MRI for patients with LBP by European and American Guidelines in sign and symptoms were also included in these questionnaires (7, 9-11).

3. Results

A total of 710 patients with low back pain were included in the study during 1 year. Sex, age, and BMI (body mass index) of patients are shown in Table 1.

Table 1. Demographic Characteristics of Patients

Characteristics	Total	Male	Female
Number (%)	710 (100)	510 (28.2)	200 (71.8)
Age (SD)	41 (18.5)		
BMI (SD)	25 (2.7)		

Only 202 patients (28.5%) of the patients were treated before requesting of MRI and 508 patients (71.5%) had no therapeutic treatment before that.

Patients were referred from different medical physicians (Table 2).

Table 2. Specialty of Referral Physicians

Specialty	Number	Percent
Neurosurgery	479	67.5
Orthopedics	101	14.2
Physical medicine	53	7.5
Others	77	10.8
Total	710	100

In our study, 117 patients (16.5%) had performed a MRI in the past 2 years, with 3 of them having 2 MRIs in the last 2 years. The response rate of patients about red flags in history and physical examination can be seen in Table 3.

Table 3. Rate of Risk Factors in Patients

	positive	Negative
Risk factors in history	135 (19%)	575 (81%)
Risk factors in examination	108 (15.2%)	602 (84.8%)
Risk factors overall	180 (25.4%)	530 (74.6%)

In the medical history, 135 of patients had positive findings that included 19% of total. Meanwhile, the highest rate was related to the history of previous surgery in the low back region in 44.4% of patients and after that the age of more than 70 years in 43.7% of patients.

In examining the risk sign, 108 patients had positive finding, which was 15.2% of the total number of patients.

In reviewing the signs and symptoms overall, 180 patients or 25.4% of the patients had at least 1 risk factor from red flags and 76.6% of patients had no findings of danger in the history or the examination.

4. Discussion

In our study, only 202 (28.5%) patients, of a total of 710, were treated before imaging and 508 patients (71.5%) had no treatment before MRI, which is unlike most guidelines (10, 12). In a previous study by Dr. Lehnert BE and his colleagues in 2010 on 459 patients, 35% of patients were not treated prior to imaging (13).

In our study, 117 patients (16.5%) had performed a MRI in the past 2 years, and 3 of the patients responding to this question had done 2 MRIs in the last 2 years. In a study by Iron K and colleagues in Ontario, 2003, on 13710 MRI cases, preliminary analysis showed that 15% had a history of MRI in the past 2 years (14). The values obtained in our study were close to this study.

Overall 76.6% of patients had no signs of risk factors in their history and examination. While in literature reviews, inappropriate request of imaging was about 26%, which seems more reasonable than our study.

In summary, according to the results of our study, imaging cases, especially MRI, in patients with low back pain in Iran are unnecessarily high in routine practice. It seems we require careful consideration in the training of practitioners in all categories and specialties.

These findings clearly reveal the lack of careful attention to the history and physical examination of patients who present with back pain complaints. The burden of this problem on the body and property of patients, although not calculated in Iran, is clearly inappropriate and very high.

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