Natural History of Radiculopathy

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KEYWORDS

• Radiculopathy • Radicular pain • Natural history

Approximately two-thirds of adults suffer from neck and low back pain.[1] Axial spine pain is often accompanied by radicular pain or radiculopathy, which is defined as spinal nerve root dysfunction causing dermatomal pain and parasthesias, myotomal weakness, and/or impaired deep tendon reflexes. Mixer and Barr first introduced the concept of herniated disc material leading to radiculopathy in 1934.[2] Since that landmark study, extensive research has been conducted on the pathogenesis, clinical presentation, and treatment of radiculopathy. An understanding of the natural history of radiculopathy is crucial because it better enables health care providers to counsel patients, recommend treatments, and assess outcomes of specific interventions. Although it can be challenging to sort through the available information given the vast differences in diagnostic criteria, length of follow-up periods, and exposure of many patients to some type of conservative management, this article aims to combine the findings from several landmark papers to provide a concise summary of the natural evolution of radiculopathy.

EPIDEMIOLOGY

The estimated prevalence of radiculopathy is 9.8 per 1000 and 3.5 cases per 1000 in the lumbosacral and cervical spine, respectively.[3,4] Patients with lumbosacral radiculopathy tend to present in the late 1920s to 1940s, whereas the peak age of presentation for cervical radiculopathy is in the sixth decade.[5,6] Various risk factors have been investigated for a causative role in the development of radiculopathy, including gender, prior episodes of neck or back pain, and occupational or recreational factors. Although some studies suggest that radiculopathy occurs more frequently in men, others have shown equal rates between genders.[5–7] Previous history of axial low back pain is a well-established risk factor for lumbosacral radiculopathy, and a prior history of lumbosacral radiculopathy has been found in patients presenting with cervical radiculopathy. Additionally, prior history of trauma was found in approximately 15% of cases of cervical radiculopathy but this association has not been documented in the

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lumbar spine. Although there is a correlation between a higher body mass and low back pain, the same relationship does not appear to exist in radiculopathy.[7] Multiple studies have shown a genetic linkage for spinal canal size as well as occurrence of disc herniation and subsequent radiculopathy.[8–10] In regards to occupational factors, lumbosacral radiculopathy occurs more frequently in patients who have performed jobs requiring manual labor, and who work in positions of sustained lumbar flexion or rotation and who engage in prolonged driving.[11–13]

NATURAL HISTORY

Lumbosacral Radiculopathy

The first study to follow the clinical course of patients with lumbosacral radiculopathy was written by Hakelius[14] in 1970. Of the 38 patients with a clinical presentation consistent with radiculopathy and a disc herniation demonstrated on myelography, 88% reported that they were *symptom-free* after 6 months. In 1983, Weber[7] published a paper documenting a prospective study of 126 patients with "sciatica". These patients were randomized to surgery or conservative management and followed for 10 years. The primary treatment given to the 66 patients in the conservative group was bed rest and paracetamol. Some patients also received physical therapy, but the type and frequency was not documented. Sixty-seven percent of patients in the conservative group reported good to fair outcomes at 1 year, 4 years and 10 years. Saal and Saal[15] conducted another prospective study that was published in 1989. They followed 58 patients with a diagnosis of radiculopathy based on physical examination, imaging, and electrodiagnostic testing. The patients were exposed to minimal treatment, including back school and stabilization exercises. At the conclusion of the 31-week follow-up period, 92% reported a good to excellent outcome and 92% had returned to work. Another paper by Weber and colleagues [16] focused on the short-term evolution of lumbosacral radiculopathy in 208 patients. These patients were placed on bed rest for one week, and then allowed to gradually resume activity. None of the patients underwent physical therapy. After 4 weeks, 70% of patients had marked reduction in pain, which corresponded to functional improvement, and 60% had returned to work. Weber's studies have also investigated prognostic risk factors of recovery as well as recurrence. The factors that correlated with a poor outcome or prolonged recovery included female gender, psychosocial problems, greater than 3 months sick leave before presentation, and a prior history of radiculopathy. A recurrence of symptoms occurs in approximately 20% of patients.[7,16]

Cervical Radiculopathy

The course of clinical improvement of cervical radiculopathy is even less well documented than that of lumbosacral radiculopathy. Spurling and Segerberg[17] published one of the first papers that attempted to address this question in 1953. They followed 110 patients with cervical radiculopathy who were primarily treated with 7 to 10 days of bed rest and traction. The average follow-up period was 23 months, and the results showed that 77% of patients had definite improvement. They noted that in the first month, 12% of patients were referred for surgical management, but none of the patients that showed a response to treatment in the first month required surgery. Lees and Turner[18] conducted another early study in 1963. They followed 51 patients with cervical spondylosis and radicular symptoms without myelopathy for 10 to 19 years. Some patients were exposed to conservative treatments, including wearing a cervical collar and manipulation, whereas others did not receive any treatment. At the end of the 10 years, 73% of patients reported having mild or no symptoms. DePlama and Subin[19]