Hemiplegic Shoulder Pain

An Approach to Diagnosis and Management

John M. Vasudevan, MD[a,*], Barbara J. Browne, MD[b]

KEYWORDS

• Hemiplegic shoulder pain • Poststroke shoulder pain • Stroke rehabilitation
• Shoulder subluxation

KEY POINTS

- Hemiplegic shoulder pain (HSP) occurs in most patients with hemiplegia, and has an adverse effect on functional outcomes.
- Evaluation and management is challenging, as HSP remains a clinical diagnosis, and many of the available treatments for HSP lack sufficient or robust support in the medical literature.
- The pathogenesis of HSP is multifactorial and includes neurologic and mechanical factors, often in combination, which vary among those affected.
- The systematic approach discussed in this article is intended help practitioners to accurately identify the factors contributing to each patient's pain, and to prescribe the most effective treatment based on the available evidence.

INTRODUCTION

Stroke, or cerebrovascular accident, is the third leading cause of death and the leading cause of adult long-term disability in the United States. Impairments from stroke vary widely, but one of the most common is hemiplegic shoulder pain (HSP). Pain and loss of function in the upper limb is a significant detriment to quality of life. HSP is a challenge to patients and their health care providers, as it reduces participation in rehabilitation, discourages motion, hinders recovery, and adversely affects function. The causes of HSP are multifactorial, have neurologic and mechanical causes, and can be generated peripherally in the limb or centrally within the brain.

Although HSP has been recognized and discussed in the medical community for decades, the evidence in the medical literature lacks sufficient quantity and quality, and

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[a] Physical Medicine & Rehabilitation, University of Pennsylvania, 1800 Lombard Street, 1st Floor, Philadelphia, PA 19146, USA; [b] Rehabilitation Medicine, Magee Rehabilitation Hospital, Jefferson Medical College, Thomas Jefferson University, 1513 Race Street, Philadelphia, PA 19102, USA
* Corresponding author.
E-mail address: john.vasudevan@uphs.upenn.edu

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is inconsistent in its conclusions. It can be confusing to manage HSP when each of its components has its own controversies in treatment. For example, even if adhesive capsulitis is identified as a contributor to HSP, debate remains regarding the best treatment practice for adhesive capsulitis itself. The purpose of this article is to assist the reader in developing a strategy for the management of HSP. No patient is exactly the same, so a one-size-fits-all treatment is unlikely to be effective. Instead, the focus should be on a consistent approach to ensure that all components of the diagnosis are addressed appropriately.

SCOPE AND SIGNIFICANCE

Every year in the United States 795,000 people suffer a new or recurrent stroke: 1 stroke every 40 seconds. More than 7 million Americans older than 20 years have had a stroke. Stroke is the third leading cause of death and the leading cause of long-term disability, costing the United States $18.8 billion annually, and with a lifetime cost of $140,000 per patient with ischemic stroke.[1] Of those who survive a stroke, approximately half have hemiplegia. Although 70% of those with hemiplegia will achieve ambulatory status, half are left with a nonfunctional arm.[2] The incidence of HSP is widely reported in previous literature, ranging from 16% to 84% but most commonly reported as near 70%.[3]

It is not only pain but associated psychological distress that limits a patient's participation in the rehabilitation process. The presence of HSP is strongly correlated with a prolonged hospital stay and lower Barthel functional score in the first 12 weeks after stroke.[4] Of patients who had a Barthel Index score of less than 15, 59% experienced shoulder pain during their hospital stay, compared with 25% of patients with a Barthel Index score greater than 15.[5] Patients with HSP are less likely to return to their home.[6] Conversely, improvement of upper limb function within the first 5 weeks after a stroke can result in improved use of the affected limb in functional tasks.[7]

PREDICTORS AND PROGNOSIS IN HEMIPLEGIC SHOULDER PAIN

HSP has a significant impact on function both during and after rehabilitation. A meta-analysis of 58 studies assessed outcomes of overall upper limb recovery according to age, sex, lesion site, initial motor impairment, motor-evoked potentials, and somatosensory-evoked potentials.[8] Only initial measures of impairment and function predicted long-term outcome. Age in itself is not clearly a risk factor on its own, but those of older age are more likely to have preexisting abnormality that affects impairment. Additional risk factors for developing shoulder pain within the first 6 months after stroke include impaired voluntary motor control, diminished proprioception, tactile extinction, abnormal sensation, spasticity of the elbow flexor muscles, restricted range of motion (ROM) for both shoulder abduction and shoulder external rotation trophic changes, and type 2 diabetes mellitus.[9] Barlak and colleagues[10] found a significant correlation between HSP and adhesive capsulitis and complex regional pain syndrome, but none between HSP and grade of subluxation, spasticity, impingement syndrome, or thalamic pain.

In addition to new impairments following a stroke, the practitioner must also consider the likelihood of pre-existing abnormality, whether symptomatic or not, which may contribute to pain in the shoulder. Shoulder pain is a common musculoskeletal complaint made to primary care physicians and a reason for referral to a musculoskeletal specialist. Rotator cuff disorders are the most common source of such pain. Partial tears of the rotator cuff are frequently seen as early as age 50 years, with the risk of severe injury increasing in the 60s and 70s age groups.[11] Degeneration