

Prevalence and Economic Burden of Adult Spinal Deformity in the United States Commercial Payer Population

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INTRODUCTION:

Adult spinal deformity (ASD) is a highly and increasingly prevalent condition in the aging United States (US) population and carries a large physiologic burden associated with high costs and healthcare resource utilization. Quantifying the economic burden associated with ASD is necessary to inform physicians, payers, and policy makers in developing better strategies for managing ASD while mitigating the considerable financial burden. The aims of this study are to: 1) determine the prevalence of ASD in a large, national commercial payer population, 2) quantify the associated economic burden from the payer and societal perspectives, and 3) better understand the breakdown of expenditures by healthcare service category.

METHODS:

Patients aged 21-64 with an encounter including a diagnosis of ASD (scoliosis, lordosis, and/or flatback) from the Merative™ Marketscan® Commercial Databases 2016-2022 were included. For the outpatient ASD cohort, patients were required to have continuous medical and pharmacy enrollment 1 year pre and 1 year post the index encounter for longitudinal tracking. The subset of patients with 2-years post-index enrollment were additionally followed out to 2 years. Those with spine surgery within the prior year, on plans not providing financial and/or outpatient pharmacy data, or neoplasms, infection, or trauma were excluded.

Outcomes included the annual prevalence of ASD among the enrolled Marketscan population, the total spine-related net (payer only) and gross (payer + patient) costs (2023 US \$) per patient overall and by healthcare resource utilization (HCRU) category (e.g. physical therapy, injections, radiology, office visits, etc.), the proportion of patients using each HCRU category, the commercial payer economic burden per 100,000 beneficiaries at 1 and 2 years, and the United States societal burden at 1 and 2 years.

RESULTS:

A total of 567,370 patients with a diagnosis of ASD were identified, putting the annual prevalence of ASD within the enrolled Marketscan commercial population aged 21-64 at 0.50% (Figure 1). In the 169,855 patients (aged 46 ±13 years 67.7% female) presenting with ASD at an outpatient encounter and meeting the inclusion and exclusion criteria, total payer expenditures per patient for spine-related care within the 1st year totaled \$7,619 (95% CI; \$7,438, \$7,800) and expenditures for nonoperative spine care totaled \$3,338 (\$3,259, \$3,418). Within 1 year, 3.5% of the cohort had fusion surgery (± decompression) and 2.9% had decompressive or other thoraco-lumbo-sacral surgery. In those having surgery, payer expenditures per patient averaged \$100,494 (\$97,187, \$103,800) for fusion surgery and \$23,093 (\$22,238, \$23,949) for other decompressive surgery within the 1st year. Of those having fusion within the 1st year, 15.3% had another spine surgery within the 1st year, and 22.2% had another spine surgery within 2 years.

Payer expenditures per 100,000 commercially-insured beneficiaries totaled over \$3.8 million for ASD patients in the 1st year following the index outpatient encounter (Table 1, Figure 2) and 5.4 million within 2 years. Payer expenditures for nonoperative spine care totaled over \$1.7 million per 100,000 beneficiaries (43.8% of total expenditures) within 1 year and 2.6 million within 2 years. While only 3.5% of patients underwent spinal fusion, fusion surgery accumulated \$1.8 million (46.3%) of total payer expenditures per 100,000 commercially-insured beneficiaries within the 1st year.

The total societal burden of spine-related care for ASD among the approximately 142 million US commercially-insured population aged 21 to 64 totaled over \$6.2 billion in the 1st year following the index ASD encounter and \$8.9 billion within 2 years. The burden of nonoperative spine care was \$3.0 billion (48.4% of societal expenditures) within 1 year and \$4.7 billion within 2 years. The burden of spinal fusion surgery, alone, was \$2.6 billion in the 1st year following the index outpatient encounter, or roughly 42.2% of total expenditures.

DISCUSSION AND CONCLUSION:

The prevalence of ASD in a large, US national commercial payer cohort aged 21-64 was 0.50%. The associated payer and societal economic burden of both operative and nonoperative care for ASD is substantial. There is considerable opportunity for the development of improved nonoperative treatment modalities to increase the value of ASD care by reducing the need for continued nonoperative interventions of limited benefit and reducing the use of costly operative care.

