Economic Burden of Nonsurgical Treatment of Adult Spinal Deformity

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INTRODUCTION: With the increasing emphasis on value-based outcomes in health care, there has been an increased focus on the cost of surgical intervention in patients with adult spinal deformity (ASD). Our analysis demonstrated that in adult spinal deformity patients, extended non-operative (N-Op) treatment results in a decline in ODI and utility. Only a subset of N-Op patients that initially had less disability and deformity showed success, maintenance, and cost effectiveness.

METHODS: N-Op and Op ASD patients with complete radiographic and HRQL data at BL and 2Y were included. Cost analysis was completed on a large insurance database assessing average cost of N-Op treatment prior to surgical intervention based on previously published treatments. Average utilization of N-Op treatment and cost were applied to our ASD cohort. Utility data was calculated using ODI converted to SF-6D with published conversion methods. Successful N-Op treatment was defined as a gain in MCID in both ODI and SRS-Pain. Patients with BL ODI ≤20 and continued ODI at 2Y ≤20 were considered N-Op successful maintenance.

RESULTS: A total of 824 patients were included (58.24yrs, 81% F). Overall, 75.5% of patients were Op and 24.5% N-Op. At BL, Op patients were significantly older, had a greater BMI, increased pelvic tilt, and increased PI-LL (all p<0.05). With respect to deformity, operative patients had higher rates of severe ++ sagittal deformity according to SRS-Schwab modifiers for PT, SVA, and PI-LL (p<0.05). At 2Y, operative patients showed significantly increased rates of a gain in MCID for PCS, ODI, and SRS Activity, Pain, Appearance, and Mental. Virtual Cost-Analysis showed average cost of nonsurgical treatment 2Y prior to surgical intervention to be $2,041. N-Op patients at 2Y had an overall gain in ODI of 0.36, did not show gain in QALY, and N-Op treatment was determined to be cost ineffective. A subset of N-Op patients however underwent successful maintenance treatment and had a decrease in ODI of -1.1 and a gain in utility of 0.006 at 2Y. If utility gained for this cohort was sustained to life expectancy, patient cost per QALY was $18,934 compared to a cost per QALY gained of $70,690.79 for posterior-only and $48,273.49 for combined approach operative patients.

DISCUSSION AND CONCLUSION: N-Op patients overall had an increase in ODI and did not show improvement in utility gained. In a subset population of successful maintenance N-Op patients with low disability and sagittal deformity, N-Op treatment was cost effective.