Depression is Associated with Reduced Functional Outcome Following Brachial Plexus Reconstruction

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Introduction

Depression has been associated with poor outcomes in neurosurgical patients, with increased pain, poorer functional recovery, delayed return to work, and decreased patient satisfaction. No reports exist regarding the association of psychiatric diagnoses with outcomes following brachial plexus reconstruction. As outcomes and patient satisfaction become increasingly important to payers and physician reimbursement, assessing modifiable pre-operative risk factors for their association with poor outcome and patient satisfaction is imperative. We retrospectively analyzed patients undergoing brachial plexus reconstruction to restore elbow flexion to assess the relationship of depression/anxiety disorders with functional outcome.

Methods

Data were collected retrospectively on all patients who underwent brachial plexus reconstruction with the goal of restoring elbow flexion between 2005 and 2013. Elbow flexion, graded on the Medical Research Council (MRC) scale, was assessed at latest follow-up. Multiple variables, including the presence of axis I psychiatric diagnoses, were assessed for their association with the dichotomous outcome of MRC = 3 (anti-gravity) versus < 3 elbow flexion. Standard statistical methods were used for analysis.

Results

During the study period, 37 patients met the inclusion criteria for the study. Mean post-surgical follow-up time was 21 months. Operations performed included neurolysis (n = 3), nerve graft repair (n = 6), and nerve transfer (n = 28). Depression was present in 10 of 37 (27%) patients analyzed. Of the

Table 1. Descriptive statistics for study patients.

Total patients	37
Median follow-up, months (IQR)	21 (14)
Mean age, yrs (SD)	35 (14.5)
Sex	
Male	35 (94.6%)
Female	2 (5.4%)
Operation performed	
Neurolysis only	3 (8.1%)
Graft repair	6 (16.2%)
Nerve transfer	28 (75.7%)
Median interval from injury to operation, months (IQR)	7 (6)
Injury	
Pre-ganglionic	10 (27.0%)
Post-ganglionic	27 (73.0%)
Injured segments	
Upper trunk	19 (51.4%)
Upper trunk plus	18 (48.6%)
Associated injuries	
Traumatic brain injury	21 (56.8%)
Long bone fracture	18 (48.6%)
Spine fracture	11 (29.7%)
Other fracture	4 (10.8%)
Visceral injury	13 (35.1%)
Vascular injury	14 (37.8%)
Mechanism of Injury	
Motor vehicle accident	30 (81.1%)
Gunshot	2 (5.4%)
Crush injury	3 (8.1%)
Other	2 (5.4%)

SD = standard deviation; IQR = interquartile range

Table 2. Univariable regression model of predictors of biceps outcome using patients with MRC scores 3 as the reference group (N = 37).

	Univariate Odds Ratio (95% CI)	Univariate *P*-value
Mean age, yrs (SD)	0.986 (0.941-1.033)	0.542
Tobacco use	2.125 (0.519-8.699)	0.295
Mean BMI, kg/m^2 (SD)	1.090 (0.951-1.249)	0.195
Depression/anxiety	4.750 (1.056-21.360)	0.042
Traumatic brain injury	1.026 (0.268-3.923)	0.970
Associated injuries, median (IQR)	1.152 (0.694-1.914)	0.583
Pre- v. Post-ganglionic Injury	2.000 (0.457-8.746)	0.357
Injured segments	1.000 (0.262-3.820)	0.999
Operation	0.278 (0.043-1.794)	0.178

Conclusions

Pre-operative depression is common in patients after brachial plexus injury. The presence of depression is associated with reduced elbow flexion recovery following reconstruction. These data suggest assessment and treatment of pre-operative mental health is important in designing a comprehensive post-operative management plan to optimize outcomes and patient satisfaction.