

Symptom Cluster Profiles Following Traumatic Orthopaedic Injuries

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INTRODUCTION

Each year, millions of Americans suffer traumatic orthopaedic injuries (TOI) [1,2]. TOI survivors often experience co-occurring symptoms of anxiety, depression, pain, sleep disturbance, and stressor-related disorders [3,4]. The regulation of brain-derived neurotrophic factor (BDNF) may contribute to co-occurring symptoms in TOI survivors [5]. Mathematically sorting TOI survivors into groups called symptom cluster profiles and testing the associations of demographic and clinical factors and markers of BDNF regulation may reveal subpopulations of TOI survivors at highest risk for post-injury symptoms and negative long-term outcomes early in the post-injury period [6].

SPECIFIC AIMS

1. Describe TOI survivors' group membership in symptom cluster profiles, indicated by pain, sleep disturbance, and symptoms of anxiety, depression, and stressor related disorders, immediately following a traumatic orthopaedic injury
2. Examine associations between demographic and clinical factors and symptom cluster profile membership among TOI survivors
3. Test hypothesis that low serum concentrations of BDNF are associated with membership among symptom cluster profiles following TOI
4. Test hypothesis that the val66met single nucleotide polymorphism (rs6265) on one or both alleles of the BDNF gene is associated with membership among symptom cluster profiles following TOI

STUDY DESIGN AND METHODS

Design: Cross-sectional

Sample Size: 150

Setting: Yale New Haven Hospital

Measures: - PROMIS Short Forms
(Anxiety, Depression, Pain, Sleep)

- Acute Stress Disorder Scale

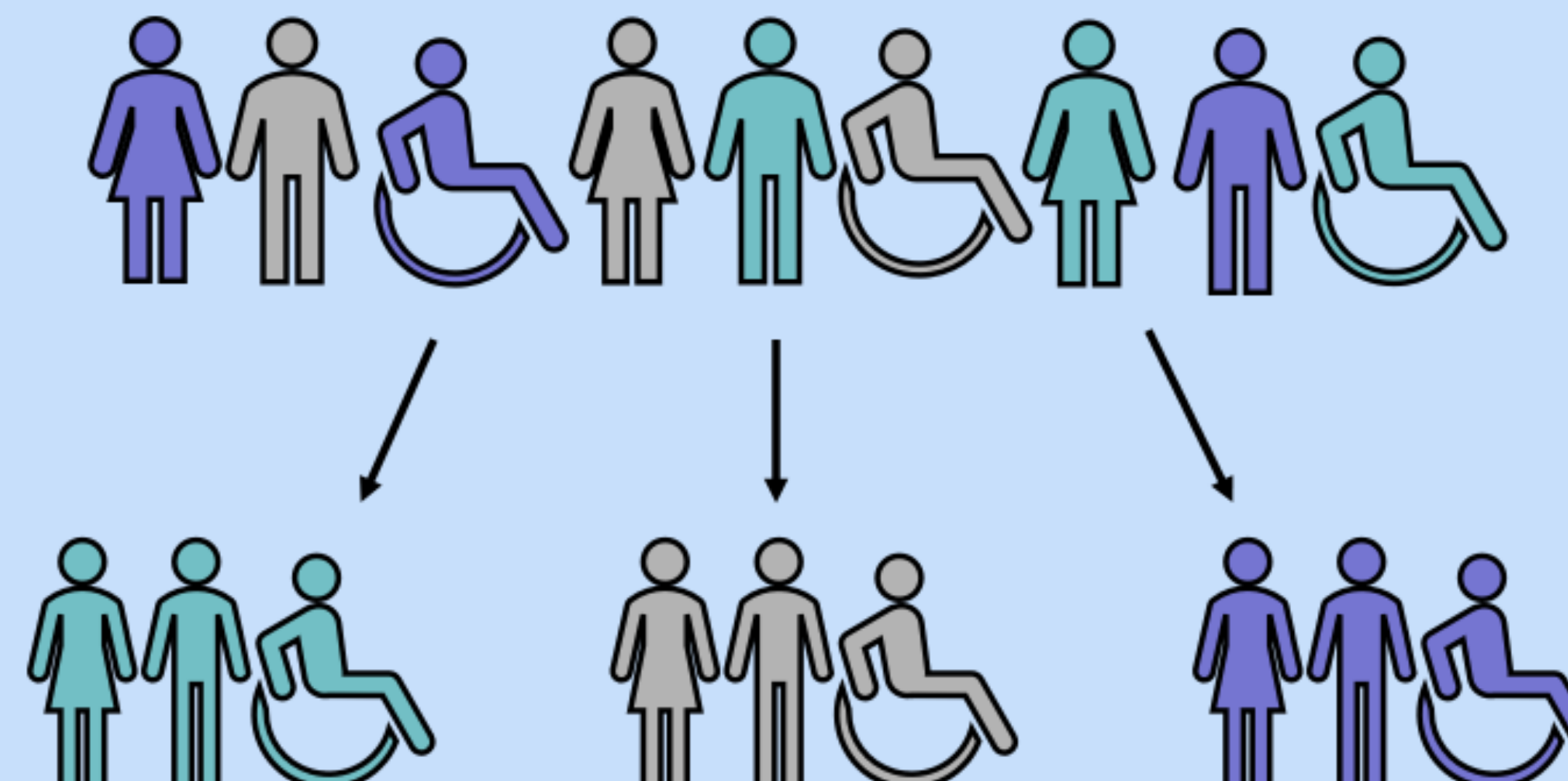
Biomarkers: - Serum BDNF Concentration
- BDNF Genotype (val/val, val/met, met/met)

Inclusion Criteria:

1. Aged 18+ years
2. Within 72 hours of injury
3. Fracture to appendicular skeleton or pelvic ring
4. Speak and understand English
5. Cognitively intact

Statistical Analyses:

- Aim 1: Latent Profile Analysis
Aim 2: Multinomial Logistic Regression
Aim 3: ANOVA / Kruskal-Wallis
Aim 4: Genotypic association testing via χ^2



PRELIMINARY RESULTS

Sample Demographics (N=74)		Sample Clinical Characteristics (N=74)	
Variable	Mean (SD) / N (%)	Variable	Mean (SD) / N (%)
Age (years)	48.55 (12.28)	Mechanism of injury	
Sex		Motor vehicle collision	21 (28.38)
Male	49 (66.22)	Motorcycle collision	11 (14.86)
Female	25 (35.78)	Pedestrian struck	7 (9.46)
Race		Fall	27 (36.49)
American Indian / Alaskan Native	1 (1.35)	Assault	4 (5.41)
Asian	1 (1.35)	Cut / Piercing	1 (1.35)
Black / African American	14 (18.92)	Industrial accident	3 (4.05)
Native Hawaiian / Pacific Islander	1 (1.35)	# of fractures	
White	51 (68.92)	1	39 (52.7)
Prefer not to answer	6 (8.11)	2	21 (28.38)
Ethnicity		3	8 (10.81)
Hispanic / Latino	15 (20.27)	4	3 (4.05)
Not Hispanic / Latino	59 (79.73)	5	3 (4.05)
Insurance Type		Open Fracture	12 (16.22)
Medicare	9 (12.16)	Operative Management	58 (78.38)
Medicaid	19 (25.68)	Admission hemoglobin	13.3 (1.86)
Private	37 (50)	Admission hematocrit	39.83 (5.09)
Tricare / VA	7 (9.46)	Lactic acid drawn	
Uninsured	2 (2.7)	No	63 (85.14)
Employment Status		Yes	11 (14.86)
Unemployed	16 (21.62)	Fracture Site	
Employed Part-Time	7 (9.46)	Right Upper Extremity	14 (18.92)
Employed Full-Time	34 (45.95)	Left Upper Extremity	7 (9.46)
Self-Employed	4 (5.41)	Right Lower Extremity	35 (47.3)
Retired	13 (17.57)	Left Lower Extremity	22 (29.73)
Education Level		Pelvis	7 (9.46)
Less than Highschool	4 (5.41)	Right Acetabulum	5 (6.76)
Graduated Highschool / GED	24 (32.43)	Left Acetabulum	6 (8.11)
Some College	22 (29.73)	Combination Injuries	
Bachelor's Degree	15 (20.27)	Isolated Upper Extremity	9 (12.16)
Master's Degree or Higher	9 (12.16)	Isolated Lower Extremity	37 (50)
Symptom Measures (N=74)		Bilateral Upper Extremities	2 (2.7)
Symptom	Mean (SD)	Bilateral Lower Extremities	7 (9.46)
		Upper and Low Extremities	8 (10.81)
		N (%) above clinical threshold	
ASDS[†]	39.86 (15.11)	N (%) PROMIS above 60	
Anxiety	58.06 (10.2)		NA
Depression	50.85 (8.19)		32 (43.24)
Pain	59.24 (6.65)		11 (14.86)
Sleep Disturbance	56.88 (10.83)		40 (54.05)