Three methods of presurgical psychological evaluation: standardization and empirical comparison

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There is strong evidence that the outcome of spinal surgery and other invasive treatments for pain is influenced by a number of psychosocial variables. Currently, there are three methodologies for performing these evaluations that have a substantial empirical basis. The method based on the strongest evidence was developed by den Boer and colleagues (den Boer et al., 2006), who used a systematic review of the research to identify seven variables that were predictive of spinal surgery outcome. While den Boer's criteria was based on the highest level of evidence, it has the least clinical applicability. In

contrast, the method developed by Block and colleagues (Block, 1996; Block, Ohnmeiss, Guyer, Rashbaum, & Hochschuler, 2001), while having some similarities to that of den Boer, has the advantage of being integrated with both a clinical assessment protocol and a treatment algorithm. More recently, eight proposed methods of presurgical psychological evaluations for spinal surgery and spinal cord stimulator patients were reviewed, as was general research on psychological factors predicting surgical outcome (Bruns & Disorbio, 2009). This study proposed what was referred to as the "Convergent Model",

METHODS

The Battery For Health Improvement 2 (BHI-2) profiles, demographic and other information was gathered from 527 patients in multidisciplinary treatment for pain or injury, with 725 community members being assessed as a control. These data were gathered from 106 sites in 36 US states. Using these data, standardized methods were developed to calculate presurgical risk using all three presurgical protocols. This method was IRB approved.

A standardized method was developed to calculate Block's criteria for presurgical risk (Disorbio, Bruns, & Bruns, 2012). This included calculating psychosocial risks, medical risks, and adverse clinical features using BHI-2 scale cutoffs of one standard deviation above the mean of the patient norms. Using these three scores and Block's assessment algorithm, Block's fivelevel risk score was calculated. To assess den Boer's criteria, the risk factors of depression, anxiety, somatization, pain complaints, function, dependency, job dissatisfaction, and time in treatment were judged to be present if the

observed scores exceeded cutoffs for one, two, or three standard deviations above the mean of the patient norms. Additionally, the education level risk factor was judged to be present if the subject was not a high school graduate. The result is a possible score range of 0-27, expanding upon an older method that did not weight the scores (Meyer, Bruns, Disorbio, & Bruns, 2012). As the exclusionary and cautionary risk factors have been standardized, that method was adopted here (Bruns & Disorbio, 2009).

RESULTS

The mean, standard deviation, median and mode of the Block scores were as follows for patients: Psychosocial (7.01, 5.49, 6.0, 4), Medical (3.23, 2.64, 3.0, 0), Adverse Signs (0.26, 0.68, 0.0, 0) and the Overall Rating (2.42, 1.26, 2.0, 2), with frequencies of 26.8%, 35.5%, 16.3%, 12.0% and 9.5% in the five groups, respectively. In contrast, the community scores were as follows: Psychosocial (3.73, 4.13, 2.0, 2), Medical (1.32, 1.91, 0.0, 0), Adverse Signs (0.11, 0.43, 0.0, 0), and the Overall Rating (1.59, 0.93, 1.0, 1).

which was based on a hypothesis that while the reviewed methods of presurgical psychological evaluations have unique qualities, there appears to be a convergence of evidence and opinion about a core set of clinical concerns, which need to be assessed.

The purpose of the present study was to empirically compare the risk assessment scores generated by these three presurgical psychological evaluation methods. In order to do so, however, it was necessary to first develop a standardized method of assessing each one.

The mean, standard deviation, median and mode of the den Boer scores were as follows for patients: 3.69, 3.68, 2.0, 1, and somewhat lower for community members: 2.60, 2.50, 2.0, 2. This information, along with the mean, standard deviation, median and mode of the previously mentioned BHI cautionary and exclusionary risk factors, can be found in Table 1.

With regard to validity, for all risk scores the mean of patients who perceived their treatments as being ineffective was significantly higher than the mean of patients who did not. This was accomplished by using a Multivariate Analysis of Variance, with the df, F, p and Eta2 (effect size) being as follows: den Boer score (df=1, F=13.241, p < .000, Eta2 = .011), Block overall score (df=1, F= 4.039, p<.045, Eta2 = .004), Cautionary score (df=1, F= 125.647, p<.000, Eta2 = .099) and Exclusionary score (df=1, F= 82.930, p<.000, Eta2 = .067). This information can be found in Table 2.

The intercorrelations between these scores were all significant (p<.001), and ranged from a low of .63 to a high of .82. This information can be found in Table 3.

The test-retest reliabilities of the risk scores were as follows: Block psychosocial risks (.924), Block medical risks (.881), Block adverse clinical features (.812), Block overall risk score (.905), den Boer score (.957), Cautionary score (.890), and the Exclusionary score (.910). This information can be found in Table 4.

CONCLUSIONS

A number of methods for presurgical psychological evaluations have been proposed, and these methods have distinct similarities and differences. All three of the methods studied, once standardized, were determined to be highly reliable, and an assessment of the validity of the den Boer, Cautionary, and Exclusionary risk scores exhibited moderate effect sizes. At the same time, the moderate intercorrelations of some of these scores demonstrate that they are at the same time valid yet distinctly different. Further research is needed understand the relative merits of each approach.

TABLE 1

Presurgical Scale Comparison Between Two Different Norm Groups

Presurgical Scale		Group		
		Patient (n=527)	Community (n=725)	
Block	Mean	2.42	1.59	
	SD	1.26	0.93	
	Median	2	1	
	Mode	2	1	
Den Boer	Mean	3.69	2.60	
	SD	3.68	2.50	
	Median	2	2	
	Mode	1	2	
BHI Cautionary	Mean	4.84	2.48	
	SD	4.18	2.94	
	Median	3	1	
	Mode	2	1	
BHI Exclusionary	Mean	0.95	0.39	
	SD	1.83	1.06	
	Median	0	0	
	Mode	0	0	

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TABLE 2

Presurgical Scale Comparison Between Satisfied and Dissatisfied Patients

Presurgical	Satisfied		Dissatisfied		Г (Дб)	F to	
Scale	Mean	SD	Mean	SD	F (OT)	Eta	P
Block	2.31	1.21	3.25	1.32	4.039 (1)	.004	P<.045
Den Boer	3.33	3.42	6.43	4.47	13.241 (1)	.011	P<.000
BHI Cautionary	4.38	3.88	8.47	4.69	125.647 (1)	.099	P<.000
BHI Exclusionary	0.77	1.65	2.36	2.48	82.930 (1)	.067	P<.000

TABLE 3

Intercorrelations of Presurgical Scales for Patients

Presurgical Scale	Block	Den Boer	BHI Cautionary	BHI Exclusionary
Block	1.00	0.71	0.82	0.63
Den Boer	0.71	1.00	0.87	0.79
BHI Cautionary	0.82	0.87	1.00	0.78
BHI Exclusionary	0.63	0.79	0.78	1.00

TABLE 4

Reliability

Measure	Test-Retest Correlation
Block	.905
Den Boer	.957
BHI Cautionary	.890
BHI Exclusionary	.910

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