소아재활

게시일시 및 장소 : 10 월 19 일(토) 08:30-12:30 Room G(3F)

질의응답 일시 및 장소 : 10 월 19 일(토) 11:00-11:30 Room G(3F)

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Predictive value of language scales in BSID III based on correlation between SELSI in infants

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INSTRUCTION

Up to 20% of 2yr old children have delayed expressive language, which resolves by 5 yrs of age in about half of cases, but others have persistent delay. It is diagnosed by standardized language assessment tools, such as the BSID III and SELSI. Since early intervention can improve developmental function and minimize the sequele of disabilities, early diagnose is crucial for treatment and good prognosis. This study is to find out about relationship between BSID III and SELSI, with a specific focus on the receptive and expressive language subscales.

METHOD

The test scores of BSID III and SELSI were retrospectively assessed on 125 infants from August 2015 to December 2018. We only focused on BSID III's language abilities about receptive and expressive language and corresponding Language Index. And SELSI is also subdivided into receptive and expressive language abilities. We calculated quotient scores based on their developmental age, by dividing estimated age by corrected age and multiplying it by 100. First, we compared quotient scores of each group and then, analyzed the correlation of these scores between language scale of BSID III and two subcategories of SELSI.

RESULT

There were no significant differences between the groups with respect to sex, gestational age, birth weight. Bayley results were classified into 4 groups(average, below average, borderline, delay). No significant correlations between variables and receptive Bayley score changes were revealed, except for gestational age. There was significant correlations between variables and expressive Bayley score, except for sex. Tested infants showed that expressive Bayley score is lower than receptive one. SELSI results were classified into 5 groups(average, borderline and mild, moderate, severe delay). Significant correlations between variables and receptive SELSI score were revealed, except for sex and expressive SELSI score and gestational & tested age had significant

correlation(Table 1). Evaluation of language test results compared between BSID III and SELSI are described in Table 2. Receptive and expressive Bayley score correlates with statistical significance to SELSI score, regardless of gestational age, birth weight, and tested age. Receptive and expressive SELSI score had no prominent difference in diagnosing as language development delay compared to Bayley scores. In ROC curve analysis, optimal cut-off value where sensitivity of 83% and specificity of 78% were achieved with receptive BSID III was 1.50 and sensitivity of 85% and specificity of 81% were achieved with expressive BSID-III was 3.5 in SELSI(Table 3).

CONCLUSION

SELSI provides reliable and valid measurements that used for the evaluation of language development delay. Correlations between language abilities of children using Bayley and SELSI were statistically significant. Therefore, receptive and expressive Bayley score can be used as an alternative screening tool to diagnose the language delay.

Table 1. Distribution of SELSI score by variables (receptive and expressive)

		SELSI score (receptive)					P-value
		Average	Borderline	Mild delay	Moderate delay	Severe delay	
Sex	Male	8 (11.0)	7 (9.6)	6 (8.2)	42 (57.5)	10 (13.7)	0.323
	Female	10 (19.2)	4 (7.7)	5 (9.6)	27 (51.9)	6 (11.5)	
Gestational age(weeks)	<37	11 (19.6)	10 (17.9)	5 (8.9)	25 (44.6)	5 (8.9)	0.002*
	≥37	6 (9.0)	1 (1.5)	6 (9.0)	43 (64.2)	11 (16.4)	
Birth weight(grams)	<2500	10 (18.9)	9 (17.0)	4 (7.5)	23 (43.4)	7 (13.2)	0.046*
	≥2500	7 (10.0)	2 (2.9)	7 (10.0)	45 (64.3)	9 (12.9)	
SELSI test (months)	<12	2 (33.3)	2 (33.3)	1 (16.7)	0 (0.0)	1 (16.7)	<0.001*
	12≤to<24	13 (34.2)	3 (7.9)	2 (5.3)	19 (50.0)	1 (2.6)	
	≥24	3 (3.7)	6 (7.4)	8 (9.9)	50 (61.7)	14 (17.3)	
Total		18 (14.4)	11 (8.8)	11 (8.8)	69 (55.2)	16 (12.8)	
		SELSI score (expressive)					P-value
		Average	Borderline	Mild delay	Moderate delay	Severe delay	
Sex	Male	3 (4.1)	7 (9.6)	2 (2.7)	45 (61.6)	16 (21.9)	0.072
	Female	6 (11.5)	6 (11.5)	4 (7.7)	28 (53.8)	8 (15.4)	
Gestational age(weeks)	<37	8 (14.3)	8 (14.3)	4 (7.1)	28 (50.0)	8 (14.3)	0.003*
	≥37	1 (1.5)	5 (7.5)	2 (3.0)	43 (64.2)	16 (23.9)	
Birth weight(grams)	<2500	7 (13.2)	8 (15.1)	2 (3.8)	27 (50.9)	9 (17.0)	0.051
	≥2500	2 (2.9)	5 (7.1)	4 (5.7)	44 (62.9)	15 (21.4)	
SELSI test (months)	<12	1 (16.7)	2 (33.3)	1 (16.7)	1 (16.7)	1 (16.7)	<0.001*
	12≤to<24	7 (18.4)	8 (21.1)	1 (2.6)	19 (50.0)	3 (7.9)	
	≥24	1 (1.2)	3 (3.7)	4 (4.9)	53 (65.4)	20 (24.7)	
Total		9 (7.2)	13 (10.4)	6 (4.8)	73 (58.4)	24 (19.2)	

Table 2. Comparison between BSID III and SELSI score (receptive and expressive)

SELSI score (receptive)	Bayley score (receptive)				Total	P-value
	Average	Below average	borderline	delay		
Average	14 (11.2)	3 (2.4)	1 (0.8)	0 (0.0)	18 (14.4)	<0.001*
borderline	7 (5.6)	4 (3.2)	0 (0.0)	0 (0.0)	11 (8.8)	
Mild delay	5 (4.0)	4 (3.2)	2 (1.6)	0 (0.0)	11 (8.8)	
Moderate delay	6 (4.8)	11 (8.8)	25 (20.0)	27 (21.6)	69 (55.2)	
Severe delay	0 (0.0)	0 (0.0)	1 (0.8)	15 (12.0)	16 (12.8)	
Total	32 (25.6)	22 (17.6)	29 (23.2)	42 (33.6)	125 (100.0)	

SELSI score (expressive)	Bayley score (expressive)				Total	P-value
	Average	Below average	borderline	delay		
Average	8 (6.4)	0 (0.0)	1 (0.8)	0 (0.0)	9 (7.2)	<0.001*
borderline	6 (4.8)	6 (4.8)	1 (0.8)	0 (0.0)	13 (10.4)	
Mild delay	0 (0.0)	5 (4.0)	1 (0.8)	0 (0.0)	6 (4.8)	
Moderate delay	3 (2.4)	6 (4.8)	27 (21.6)	37 (29.6)	73 (58.4)	
Severe delay	0 (0.0)	1 (0.8)	2 (1.6)	21 (16.8)	24 (19.2)	
Total	17 (13.6)	18 (14.4)	32 (25.6)	58 (46.4)	125 (100.0)	

Table 3. Distribution of SELSI rate according to BSID III Score (receptive and expressive)

Cut off value	Bayley score (receptive)				Validity
	Sensitivity	specificity	False positive rate	False negative rate	
0.00	1.00	0.00	0.00	1.00	
1.50*	0.83	0.78	0.17	0.22	
2.50	0.65	0.94	0.35	0.06	
3.50	0.39	1.00	1.00	0.00	
5.00	0.00	1.00	1.00	0.00	

Cut off value	SELSI score (expressive)				Validity
	Sensitivity	specificity	False positive rate	False negative rate	
0.00	1.00	0.00	0.00	1.00	
1.50	0.96	0.44	0.04	0.56	
2.50	0.91	0.66	0.09	0.34	
3.50*	0.85	0.81	0.15	0.19	
4.50	0.17	1.00	0.83	0.00	
6.00	0.00	1.00	1.00	0.00	