Brief report

Social communication impairments and restricted, repetitive patterns ("Kodawari") considered from the "Comprehension" section of the WISC-IV in autism spectrum disorder

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Abstract

Background: Many studies have used the Wechsler Intelligence Scale (WISC) to examine the characteristics of autism spectrum disorder (ASD). However, most studies have been based on profile analysis, not on content analysis. **Objective:** The objective of the present study was to apply the WISC-IV to clinical assessment of ASD and clarify how the characteristics of the disorder were reflected in specific items. **Methods:** The study participants were 20 patients aged 5-16 years diagnosed with ASD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). We recruited 20 patients with attention-deficit/hyperactivity disorder (ADHD) and 20 patients with other disorders (neurotic disorders) as controls. We then compared the scores of the ninth item of the WISC-IV ("Comprehension") among the three groups. **Results:** The differences observed between the ASD vs. the other disorders group were not significant by the standard scoring method. Thus, a two-level scoring method of 0 and ≥1 point was adopted. As a result, significantly more participants in the ASD group scored 0 points compared with the ADHD and other disorders groups. **Discussion:** The results of the present study revealed that a characteristic of ASD appeared in the ninth item of "Comprehension" on the WISC-IV.

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Keywords: Autism spectrum disorder, attention-deficit/hyperactivity disorder, content analysis, DSM-5, WISC.

Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)[1], autism spectrum disorder (ASD) is diagnosed as (A) persistent deficits in social communication and social interaction across multiple contexts, and (B) restricted, repetitive patterns of behavior, interests, or activities. Many studies have used the Wechsler Intelligence Scale (WISC) to examine the characteristics of ASD. Most of those investigations analyzed score profiles from the WISC-III[2] or WISC-IV[3].

However, it has been noted that the characteristics of ASD are not clarified based on a profile analysis as the intelligence score increases[4]. With this background, Kuroda *et al.*[5] analyzed results from the WISC-III for three boys (intelligence quotient [IQ] > 100) diagnosed with pervasive developmental disorder (PDD) according to the DSM-IV. They summarized their findings as follows: 1) difficulties with understanding the minds of others, 2) qualitative impairments in communication, 3) perseveration, 4) weak central coherence, and 5) visualization (over-concrete thinking). However, they did not focus on a specific item; rather, they attempted to identify various characteristics in various items. For clinical application, we considered that it might be more practical to clarify which characteristics appear in which items. Therefore, to identify useful items for the diagnosis of ASD, we examined whether the characteristics of ASD appear in specific items. We also considered the future possibilities and usefulness of such research methods.

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Methods

Participants

The study participants were 20 patients aged 5-16 years who had visited our clinic between January 1, 2014 and December 31, 2017 and been diagnosed with ASD according to the DSM-5. All patients had an IQ ≥ 80 according to the WISC-IV. It was considered best to select controls from clinical cases in which a differential diagnosis was problematic. Therefore, we also recruited 20 age matched patients with attention- deficit/hyperactivity disorder (ADHD) and 20 age-matched patients with other disorders (e.g., anxiety disorders, obsessive-compulsive and related disorders, stressor-related disorders, dissociative disorders, somatic symptom and related disorders) as controls.

Other disorders were so-called neurotic disorders according to the tenth revision of the International Classification of Diseases[6].

No significant differences in age, IQ, or male-female ratio were observed between the ASD and other groups (Table 1).

Table 1. Baseline characteristics of participants

	ASD	ADHD	Other disorders
N	20	20	20
Sex (M/F)	13/7	17/3	8/12
Mean age (SD) in years	10.83 (3.67)	10.80 (2.50)	11.15 (3.01)
Mean IQ (SD)	92.10 (12.86)	92.35 (10.16)	98.45 (10.65)

No significant differences in age, IQ, or male-female ratio were observed between the ASD and other groups.

Measurement

Since no prior research has examined the characteristics of ASD for specific items of the WISC-IV, we chose a specific item of the WISC-IV based on the diagnostic criteria for ASD in the DSM-5 and the psychologist's experience that patients with ASD were not good at making apologies for others, and then compared and examined the scores among the three groups. Since the independence between the items could not be assured, it was judged that a multivariate analysis was not appropriate.

The essence of item A of the diagnostic criteria for ASD in the DSM-5 is "a lack of a viewpoint of others". Regarding the associated question, the ninth item of the "Comprehension" section asks about the reasons why we apologize when we hurt the feelings of others. We chose this item because it refers to making an apology to another person, which means that we must think about that person's feelings and about maintaining or repairing our relationship. We thought that this item would make it relatively easy to assess the presence or absence of a viewpoint of others.

Next, the essence of item B of the DSM-5 diagnostic criteria is so-called "Kodawari", a Japanese word meaning restricted, repetitive, and stereotyped patterns of thinking and behavior. This is a characteristic observed as a way of answering many items, rather than a specific one. However, the ninth item of the "Comprehension" section is appropriate for evaluating "Kodawari" because it asks for multiple reasons, which patients with "Kodawari" may not be able to do because they have difficulty switching viewpoints.

There are three general criteria for scoring the ninth item; these are "General criterion A: Contents about human relations", "General criterion B: Contents about reflection", and "General criterion C: Contents about sympathy". Regarding scores, 2 points are awarded for answering two or more of these items, 1 point is awarded for answering one item, and 0 points are awarded for not answering any items.

Data were collected and statistically analyzed according to the following procedure:

1) First, we adopted standard (general) scoring, i.e., three stages of 0, 1, and 2 points, and then aggregated and examined the distribution of scores between the ASD vs. ADHD groups and the ASD vs. other disorders groups. 2) Next, if the comparison of one or the other was

not statistically significant, we adopted scoring that emphasized the differences between lower scores, i.e., 0 points and ≥1 point, because clinical psychologists find that patients with ASD are particularly bad at recognizing the emotions of others.

Statistical analyses

For the statistical analysis, Fisher's exact test was conducted using Statcel software (2nd ed.; OMS Publishing Inc., Saitama, Japan)[7].

Results

When the three levels of 0, 1, and 2 were adopted, significant differences were found in the score distribution of the ninth item of the "Comprehension" section between the ASD vs. ADHD groups. Similar results were observed for the ASD vs. the other disorders groups, but these differences were not significant.

Since the differences observed between the ASD vs. the other disorders groups were not significant, a two-level scoring method of 0 and ≥1 point was adopted. As a result, significantly more participants in the ASD group scored 0 points for the ninth item of the "Comprehension" section compared with the ADHD and other disorders groups (Table 2).

Table 2. Scores for the ninth item between the ASD *vs.* ADHD groups and the ASD vs. other disorders group when emphasizing the difference between lower scores

	0 points	≥1 point	Total
ASD	9	11	20
ADHD	3	17	20
Other disorders	3	17	20

Discussion

Previous studies have evaluated the cognitive characteristics of ASD through investigating biases between abilities by conducting a profile analysis, such as difference in WISC-III or WISC-IV subtest scores. Oliveras-Rentas et al.[8] investigated 56 cases with high-functioning ASD, and found that the results of the WISC-IV were strong for "Matrix Reasoning" and "Similarities" and weak for "Comprehension", "Coding", and "Symbol Search". They said that "Comprehension" was correlated negatively with social symptoms and "Coding" and "Symbol Search" were sections comprising the Processing Speed Index. However, it has also been reported that it is difficult to identify specific profiles of the WISC in individuals with higher IQ scores, such as those with high-functioning ASD with above-average intelligence[4]. Therefore, it is difficult to determine whether patients have ASD from a profile analysis.

Kuroda et al.[5] analyzed the WISC-III scores of three high-functioning patients with PDD in detail. They found in the "Comprehension" section that patients with ASD often failed to recognize the emotions of others. Based on the findings of Kuroda et al.[5] and our own daily clinical experience, we focused specifically on the ninth item of the WISC-IV with the aim of aiding the diagnosis of highly-functional ASD. Based on our clinical experience that patients with high-functioning ASD are particularly bad at recognizing the emotions of others, an analysis was added that emphasized the differences in lower scores. Significantly lower scores were found in the ASD group compared to both the ADHD and other disorders groups.

This result suggests that patients in the ADHD and other disorders groups can express "human relations", "reflection", and "sympathy" to varying degrees on the ninth item of the "Comprehension" section in the WISC-IV. However, patients with ASD find this more difficult, and these results support our hypothesis.

It is relatively easy for general clinicians to ask whether patients are frequently isolated and pay attention to specific things in daily life when diagnosing high-functioning ASD in daily clinical practice. However, it is difficult for non-experts to identify psychological characteristics

in daily practice. The ninth item of the "Comprehension" section is a relatively simple question. It asks respondents the reasons why they apologize when they hurt the feelings of others. Moreover, the scoring method is straightforward. The results of the present study may have clinical significance, as they suggest the possibility of a simple psychological evaluation method for daily clinical practice.

A limitation of the present study was that only the ninth item of the "Comprehension" section in the WISC-IV was used. No other items were considered. Takekoh *et al.*[9] suggested that persistence (similar to "Kodawari") was observed for "Cancellation" in the WISC-IV. Other items in the WISC-IV should be investigated in a future study.

Conclusion

A content analysis of the ninth item of the "Comprehension" section in the WISC-IV seemed to reflect "a lack of a viewpoint of others" and to be related to the characteristic of "limited repetitive pattern ("Kodawari")" in the ASD group. Significant differences were observed in the scores between the ASD vs. the ADHD and other disorders groups when we used a scoring method emphasizing the differences between lower scores.

These findings suggest that the characteristics of ASD could be grasped more easily by focusing on the ninth item of the "Comprehension" section.

Portions of this paper were presented by N.S. at the 38th Annual Meeting of the Japanese Society for Psychiatric Diagnosis (Kawagoe, 2018).

Ethical approval

This study was approved by the IRB of Saitama Medical University Hospital.

Disclosure

The authors declare no conflicts of interests.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, DC: American Psychiatric Association; 2013.
2. Wechsler D. Wechsler Intelligence Scale for Children – Third Edition. New York, NY: The Psychological Corporation; 1991.
3. Wechsler D. Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV). San Antonio, TX: The Psychological Corporation; 2003.
4. Mesibov GB, Shea V, Adams LW. Understanding Asperger syndrome and high functioning autism. New York, NY: Kluwer Academic/Plenum Publishers; 2001.
5. Kuroda M, Yoshida Y, Uchiyama T, Kitazawa K, Iizuka N. [A new clinical utility of the WISC-III for PDD-content analysis of responses from 3 cases]. Jpn J Child Adolesc Psychiatry. 2007;48:48-60.
6. World Health Organization. ICD-10: The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva: WHO; 1992.
7. Yanai H. 4 Steps Excel statistics "Statcel 2nd ed.". Saitama, Japan: OMS Publishing Inc.; 2007.
8. Oliveras-Rentas RE, Kenworthy L, Roberson RB 3rd, Martin A, Wallace GL. WISC-IV Profile in High-Functioning Autism Spectrum Disorders: Impaired Processing Speed is Associated with Increased Autism Communication Symptoms and Decreased Adaptive Communication Abilities. J Autism Dev Disord. 2011;42(5):655-64.
9. Takekoh M, Ikeda N, Yamauchi Y, Yamauchi Y, Honda M, Miyao M, et al. Usability of the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV) "Cancellation" from the Perspective of Executive Function. Jpn Rehabil Med. 2014;51:654-61.