An Intervention to Overcome Eating Difficulties in a Patient with Autism Spectrum Disorder -A Case Study

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Abstract: Introduction: Patients with autism spectrum disorder (ASD) may present with problems related to eating behaviors, including unbalanced diet, attention disruption, and poor tool manipulation. These problems are attributed to the widespread sensory processing abnormalities associated with ASD. Therefore, it is important to consider interventions and support for eating behaviors in patients with ASD that address these sensory processing problems. However, to date, no studies have investigated interventions to aid eating behaviors in this population. Here, we describe an action-based intervention to promote food ingestion in a young adult with ASD.

Methods: An A-B method with a single-system research design was implemented, with three main outcome measures: goal attainment scaling (GAS), time required to eat, and functional independence measure (FIM). Following baseline measures, the intervention was based on changes in eating actions and consisted of two phases. In Phase I, the eating environment was adjusted. Phase II supported the manipulation of eating tools in addition to environmental adjustments.

Results: The eating action changed from needing complete assistance with eating to her own manipulation of eating tools and the ability to ingest food orally. The time needed for eating was reduced, while the GAS and FIM scores both improved.

Conclusion: The organization of the environment promoted eating, while the manipulation of eating tools promoted the flow of actions. When a person with ASD has eating difficulties, it is suggested that manipulating the eating tools may be useful to promote oral ingestion in addition to environmental adjustments.

Keywords: autism spectrum disorder (ASD), eating action, eating environment, action-perception

Introduction

Problems related to eating behaviors in patients with Autism Spectrum Disorder (ASD) have been reported, including unbalanced diets, attention disruptions, and poor tool manipulation [1]. These problems are attributed to the widespread sensory processing abnormalities associated with ASD [2]. Problems with sensory processing continue into adulthood and inconvenience in activities of daily living (ADL) [3]. In adulthood, sensory processing problems contribute to hyperreactivity and have been linked to the core symptoms of ASD [4, 5]. Therefore, it is important to consider support for eating behaviors in patients with ASD presenting with sensory processing problems. However, there is no report on specific support for adults with ASD. The purpose of this study was to outline a specific intervention to aid ADL; focusing on eating difficulties from an action-perception viewpoint [6].
Subject

The patient was a 23-year-old woman admitted to the hospital for fever of unknown origin. She had been diagnosed with a pervasive developmental disorder (now diagnosed as ASD) at the age of nine. After hospitalization, the fever resolved, but oral ingestions continued to be difficult. She had a strong resistance to exercising and was anxious. The Japanese Sensory Inventory-mini (JSI-m) explores the possibility of sensory dysregulation. Her inventory result was red; hence, a diagnosis of hyperesthesia was presumed. Sensory processing problems in childhood may persist into adulthood [3]. Therefore, behaviors that were scored during childhood on the JSI-m were used as clues to understand adult tendencies. The patient communicated by nodding only and all ADL required the assistance of her parents.

Eating action

The eating environment was on a bed in a private room. Around the time of eating, the body turned rigid, and the patient became nervous due to visual and auditory stimuli from outside the room. A spoon was used as the eating utensil. However, the patient was hesitant to reach food and could not scoop the food. As a result, the consumption of the meal was fully assisted by her mother.

Method

Procedure

An A-B method with a single-system research design comprising three target outcomes was conducted to assess the effects of the intervention. The baseline was 3 weeks without occupational therapy (OT). Thereafter, the intervention was performed for 5 weeks. Signed informed consent for this study was obtained from her mother.

1) GAS (Goal Attainment Scaling)

GAS was adopted to carry out patient-centered interventions, with the patient’s therapist and family’s help in setting the goals [7]. The individual goal was stable oral ingestion (Table 1). We quantified changes in GAS scores before and after baseline and OT interventions.

2) Eating; required time

The time required to eat, which can also be considered eating “efficiency,” was measured daily for up to 60 minutes.

3) FIM (Functional Independence Measure)

ADL performance was scored by FIM and measured at admission and before and after the OT intervention.

Therapy process

The intervention based on action-perception was divided into two phases.

| Goal area                  | Score | Eating action: Intervention of her mother | Eating action: Intervention of her therapist |
|----------------------------|-------|------------------------------------------|--------------------------------------------|
| Much less than expected    | -2    | She can eat less than 50% of jelly food by assisting her mother in oral ingestion | She can eat a little jelly by assisting her therapist in oral ingestion |
| Somewhat less than expected| -1    | She can eat more than 50% of jelly food by assisting her mother in oral ingestion | She can eat less than 50% of jelly food by assisting her therapist in oral ingestion |
| Programme goal             | 0     | She can eat less than 50% of rice porridge by assisting her mother in manipulate the eating utensils and tableware | She can eat more than 50% of jelly food by assisting her therapist in oral ingestion |
| Somewhat better than expected | +1   | She can eat more than 50% of rice porridge by assisting her mother in manipulate the eating utensils and tableware | She can eat less than 50% of rice porridge by assisting her therapist in manipulate the eating utensils and tableware |
| Much better than expected  | +2    | She can eat herself less than 50% of rice porridge or noodles without assistance | She can eat herself less than 50% of rice porridge or noodles without assistance |

GAS is a tool for respecting the values of patient and their family, incorporating therapist’s judgment, and conducting patient-centered interventions. Her personal goal was stable oral ingestion.

GAS: Goal Attainment Scaling
Phase I: 1st week

The dining table was separated from the bed, and the area was closed with curtains and doors. Only the utensils and tableware were placed on the table.

Her therapist scooped up food with a spoon and guided her head to encourage a relationship in which her mouth and food approached each other. The spoon was then guided to a stable contact with her lower lip, and the food was removed by her upper lip.

Phase II: 2nd to 5th weeks

From the 2nd week, the meal was changed to rice porridge and soft food, and utensils and tableware were handled by the patient (Fig. 1). Her therapist guided her hand to assist in using the spoon and bowl. When scooping food, her therapist started by bringing the spoon into contact with the inner surface of the bowl to stabilize it. Then, her therapist’s guidance was shifted from a gathering manipulation to a scooping manipulation based on the sense of food resistance. Spooning food into the mouth continued while maintaining the spoon in contact with her lower lip from the inside of the bowl.

Results

The patient was hospitalized for eight weeks. Table 2 shows the changes in target outcomes in each period. GAS scores improved following the intervention. In the final stage of the interventions, the patient was able to consume all food with assistance in the use of eating utensils. She was also able to self-feed for about 50% of her eating, and the required time to eat was reduced. FIM was also improved after the intervention, and her mother reported that the patient’s eating action was maintained after discharge.

Discussion

Prior to the intervention, the patient was unable to orient herself to the layout of the dietary environment, which was full of visual stimuli, and was overreacting to auditory stimuli from surrounding noise and involvement of others. ASD is characterized by an overreaction to sensory stimuli [4, 5], and hypersensitivity to sensory processing tends to distract them from eating. The dis-
traction might lead to problems with eating behaviors [8]. For this reason, the patient had persistent tension during mealtimes and could not progress to eating actions. Persons with ASD tend to make decisions based on rules [9]. Therefore, her therapist offered the patient an action-based viewpoint, based on the perception of tactile sensation from the adjusted eating environment, to the manipulation of eating tools, and the sensory experience of food in the mouth. To promote eating, adjusting the eating environment and encourage behavioral changes offer promising results [6]. Therefore, it is conceivable that the interdependent experience of perception and action partly explains the improvement in ADL in general.

Conclusion

When adult patients with ASD have difficulty eating, it is suggested that in addition to environmental adjustments, the manipulation of eating tools based on the perception of tactile sensation may be useful to stimulate oral ingestion. However, the findings of this case report must be tested in a larger group to establish the real effectiveness.

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