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Understanding Pica and Delayed Developmental Milestones in Children with Intellectual Disability: A Psycho-educational Case Study

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Abstract

This psycho-educational case study investigating the relationship between Pica, a feeding and eating disorder characterized by the persistent ingestion of non-nutritive substances, and significant developmental delays in a child with Intellectual Disability (ID) and co-occurring Neurodevelopmental disorders. The study assessed the behavioural, cognitive, and adaptive profile of Tinashe, a 14-year-and-4-month-old male who had never attended formal schooling and presented with profound developmental delays, non-verbal communication, and chronic Pica behaviours. A mixed-methods approach was utilized, incorporating caregiver interviews, direct behavioural observations, a Mental Status Examination, and the Vineland Social Maturity Scale (VSMS) to assess adaptive functioning. Findings indicated that Tinashe exhibited profound delays in speech, motor coordination, and social interaction, consistent with moderate ID and mild Autism Spectrum Disorder (ASD) traits. His Pica behaviour, which included the ingestion of sand and stones, posed serious health risks and was compounded by poor impulse control and lack of safety awareness. Adaptive functioning was significantly below age expectations, reflected by a Social Coefficient (SQ) of 35, and a failure to establish toilet training. The case concluded that the persistence of Pica and severe developmental delays necessitates urgent multidisciplinary support, including medical evaluation, Applied Behaviour Analysis (ABA) based therapy, and specialized educational placement with an Individualised Educational Plan (IEP), contingent upon successful toilet training. Recommendations focus on structured routines, positive reinforcement, environmental safety, and comprehensive caregiver training.

Key words: Pica, Neurodiversity, Intellectual Disability, Developmental Delay, Psycho-educational Assessment

Introduction

Pica is formally classified in the DSM-5 as a feeding and eating disorder defined by the recurrent ingestion of non-nutritive, non-food substances for at least one month, inappropriate to the individual's developmental stage. Substances commonly ingested include paper, soap, sand, or stones. While relatively understudied, individuals with Pica are at an increased risk of significant medical consequences linked to infection, intoxication, anaemia, and gastrointestinal obstruction from ingested non-food substances (APA, 2013).

According to Rose et al, (2022), research has shown that there is not one single, central theory that fully explains Pica behaviour in children. Several theories have been proposed to explain the initiation and co-occurrence of Pica behaviours. Provost et al, (2020) say, nutritional theories associate Pica behaviour to specific deficiencies of certain minerals such as iron and zinc. This theory proposes that people with deficiencies in specific minerals might develop cravings for non-food items that could address their nutrient deficiencies. The sensory and physiological theories of Pica indicate that individuals prefer non-food items because they enjoy the taste, texture, or smell of the item.

Assessment of the Client Problems

- Caregiver Interviews: Structured interviews were conducted with Tinashe's caregivers to establish a detailed developmental, social, and educational history.
- Behavioural Observations: Direct observations were conducted in the assessment room, focusing on identifying triggers, frequency, and environmental contexts of Pica episodes, as well as general demeanour and response to instructions.
- Mental Status Examination (MSE): Used to assess Tinashe's general appearance, motor activity, affect, and speech.
- Vineland Social Maturity Scale (VSMS): This standardized assessment was administered through a caregiver interview to quantify Tinashe's personal and social skills, or social maturity (adaptive behaviour), across eight domains: communication, general self-help ability, locomotion, occupation, self-direction, self-help eating, self-help dressing, and socialisation. Other cognitive and language-based tests were deemed inappropriate due to his non-verbal status and lack of formal schooling.
- Multidisciplinary Referral: A referral for a medical examination was also initiated to rule out potential nutritional deficiencies, gastrointestinal complications, and to formally evaluate hearing capacity.

Assessment Results and Interpretation

Clinical Observation and MSE

Tinashe was noted to have a small, non-age-appropriate stature. He was poorly groomed and dressed. He exhibited poor fine and gross motor skills, non-verbal communication (groaning/mumbling), delayed developmental milestones, and did not respond well to instructions. During the MSE, he displayed unusual mannerisms, sat unless prompted, and had a very poor response rate to the examiner's instructions, making rapport difficult to establish.

Vineland Social Maturity Scale (VSMS) Results

The VSMS results provided a quantitative measure of Tinashe's adaptive functioning:

Domain	**Score**	**Age (Years-months)**
Self-help General	5	4.0
Self-help eating	5	5.5
Self-help dressing	5	4.0
Self-direction	4	3.5
Occupation	4	3.5
Communication	2	0.7
Locomotion	6	4.2
Socialisation	2	0.7

The calculated scores were:

- Raw Score (RS) : 35
- Social Age (SA) : 5 years
- Chronological Age (CA) : 172 months (14 years 4 months)
- Social Coefficient (SQ) : 35

Autism Speaks Canada, (2020) asserts that, intellectual disability and developmental delays (DD) have been associated with motor and sensory differences, and some children with DD may not understand the difference between edible and inedible items. Mayes and Zickgraf (2019) observed that Pica was one aspect of a pattern of divergent eating behaviours' including picky eating and hyper-sensitivity to textures of food in children with autism. Pica, as a feeding disorder, remains an understudied phenomenon in childhood. While sensory preferences have been linked to the emergence of food fussiness in young children, Steinbeck et al, (2017) add that, the relationship between these factors and Pica in children is still relatively uncharted. Sturmey & Williams, (2016) say, the extent of Pica occurrence within community settings is poorly understood because there are few epidemiological studies.

This case study was initiated to explore the relationship between significant intellectual limitations, neurodevelopmental delays, and the persistent, chronic manifestation of Pica, and to outline appropriate educational and behavioural interventions.

Client Details

Surname:	MMM
Name(s):	Tinashe (pseudonym)
Sex:	Male
Date of Birth:	09 December 2010
Age at Assessment:	14 years, 4 months

Referral details

Referred by: Madam Zee, teacher at TTT Primary School, Masvingo District

Reason for Referral: To determine appropriate educational placement and access to Ministry support services

Background History

Tinashe had not enrolled in any formal school or Early Childhood Development (ECD) programs. His parents, who lived on a low income, expressed the wish to enrol him at a specialised Resource Unit (RU) within a mainstream school in Masvingo. The family lived approximately 4 to 5 km from the nearest school. Developmental history obtained via caregiver interview indicated significant delays:

Birth: Full-term, normal delivery, but the baby did not have his initial cry and required resuscitation in an incubator. Prolonged labour was noted, though the mother denied pre-natal stress or substance abuse.

Gross Motor Milestones: He sat at 1 year 2 months, crawled at 2-3 years, and walked at 5 years.

Current Skills: Tinashe is non-verbal, communicating primarily through groaning and mumbling, and does not respond well to simple instructions or visual cues. He exhibits poor fine and gross motor coordination, requiring assistance with balance. He is not toilet-trained and struggles with adaptive skills such as bathing, dressing, and simple house chores.

Presenting Problem

The primary presenting concerns were suspected Intellectual Challenge. Caregivers reported he constantly fed on non-food items such as sand and stones, seemingly always hungry and only stopping when food is depleted, not when full. This persistent behaviour poses significant health risks. Tinashe avoided eye contact, preferred solitary play, and demonstrated limited engagement with peers or adults. He had a cool temperament but is not described as cheerful, often groaning or mumbling. Tinashe's adaptive functioning was severely compromised, including poor self-help skills, social skills, memory, and rate of learning. His lack of toilet training was a significant barrier to formal educational enrolment.

Interpretation: An SQ of 35 suggested severe impairment in social maturity compared to age expectations, as an SQ below 70 indicate a significant social delay. The results indicated significant delays across all domains, with the most serious challenges noted in communication and socialization (Social Age of 0.7 years-months), as well as self-help direction.

Diagnostic Impressions

The findings, supported by clinical observation and the VSMS results, were consistent with:

Moderate to Severe Intellectual Challenge (IC): Suggested by the profound developmental delays, poor learning rate, and a Social Coefficient of 35.

Pica (Feeding and Eating Disorder): indicated by the chronic, persistent ingestion of non-food items (sand, stones).

Mild Autism Spectrum Disorder (ASD) Traits: Indicated by solitary play, avoidance of eye contact, lack of social reciprocity, and sensory-seeking behaviours, with a CAST score suggesting mild ASD.

Severe Expressive Language Disorder/Non-verbal Communication: Shown by his reliance on groaning and mumbling, and an extremely low communication Social Age of 0.7 years-months.

Case Formulation

Tinashe's profile represents a complex case of neurodevelopmental disorders where a moderate to severe Intellectual Challenge, combined with traits of mild ASD, underpins significant delays in adaptive functioning and the presence of Pica. The persistence and severity of the Pica behaviour (ingestion of sand and stones) is likely rooted in several interacting factors: Cognitive Limitation: His ID and profound developmental delay (SQ of 35) limit his ability to understand safety boundaries and differentiate between edible and inedible items. Sensory-Seeking Behaviour: The Pica aligns with the sensory-seeking tendencies and divergent eating patterns often observed in children with neurodevelopmental profiles like ASD. The ingestion may be providing a sought-after taste or texture. Environmental Factors: The lack of formal schooling, limited supervision, and absence of structured therapeutic support exacerbate his vulnerability and contribute to the persistence of these maladaptive behaviours.

His severely limited adaptive functioning, evidenced by the inability to manage basic self-care, mobility, and the lack of toilet training, reinforces the urgent need for a structured and specialised intervention. The lack of expressive communication further limits his ability to communicate needs, leading to reliance on maladaptive behaviours, such as Pica, to regulate his environment or sensory state. The formulation clearly suggests that Tinashe requires a multidisciplinary intervention strategy to address both the immediate medical risks posed by Pica and his psycho-educational needs for developmental progress.

COURSE OF THE THERAPY

Initial Phase: Assessment and Engagement

The therapeutic process began with a comprehensive psycho-educational assessment to understand Tinashe’s developmental profile, behavioral patterns, and adaptive functioning. Initial engagement was challenging due to his non-verbal status, limited social interaction, and sensory-seeking behaviors. Tinashe exhibited frequent Pica episodes, groaning, and avoidance of eye contact. He required assistance with directions and showed no awareness of toilet routines.

Caregiver interviews revealed that, Tinashe had never attended school or received early childhood intervention. His family expressed concern about his exclusion from formal education and lack of access to specialized services. The assessment confirmed suspected mild Autism Spectrum Disorder (ASD), Pica and Intellectual Disability (ID).

A multidisciplinary referral was initiated, including medical evaluation for Pica-related complications, audiological assessment, and consideration for educational placement in a specialized institution after successful toilet training.

Middle Phase: Intervention Implementation

Therapeutic goals were established based on assessment findings. The focus areas included:

Behavioural Management of Pica:

Applied Behavior Analysis (ABA) techniques were introduced to reduce Pica behaviors. Positive reinforcement strategies were used, such as verbal praise and small rewards for safe play and avoidance of non-food items. Environmental modifications were made to limit access to sand and stones

Communication Support:

Augmentative and Alternative Communication (AAC) tools were introduced, including picture exchange systems and visual prompts. Caregivers were trained to use firm and calm language to discourage unsafe behaviors and reinforce safe alternatives.

Motor and Toilet Training:

Occupational therapy sessions focused on improving fine and gross motor coordination. A structured toilet routine was implemented, with visual schedules and reinforcement for successful toilet use.

Social and Emotional Development:

Tinashe was gradually introduced to peer interaction through guided play and sensory activities. While he continued to prefer solitary play, he began to tolerate proximity to others and showed reduced anxiety in structured settings.

Progress Monitoring and Adjustments

Monthly sessions were conducted to monitor progress and adjust interventions. Tinashe responded positively to predictable routines and consistent caregiver involvement and he began to show interest in safe sensory alternatives such as textured toys, which promote sensory development and creative play.

Communication remained limited, but he demonstrated improved responsiveness and visual cues. Motor coordination improved slightly, with increased stability during walking and better hand-eye coordination during play.

Toilet training showed incremental success, with Tinashe remaining dry for longer periods and was no longer messing himself at night. Caregivers reported increased confidence in managing his routines and behaviours.

6. Conclusion

Tinashe, a 14-year-and-4-month-old male, presents with a complex neurodevelopmental profile consistent with Pica, suspected Intellectual Challenge, mild Autism Spectrum Disorder traits, and a severe expressive language disorder. His adaptive functioning is severely compromised (SQ=35), and he requires constant supervision and support for basic daily living skills, including a lack of successful toilet training.

The persistence of his Pica behaviour, feeding on sand and stones, poses a substantial, life-threatening risk due to potential infection, intoxication, and gastrointestinal complications. This case highlights the crucial link between profound developmental delays, intellectual limitations, and the co-occurrence of feeding disorders like Pica.

7. Recommendations

Based on the psycho-educational assessment and case formulation, an urgent, structured, multidisciplinary treatment plan is required.

Medical and Multi-disciplinary Intervention

Medical Evaluation: Immediate referral to a physician for a comprehensive assessment to rule out gastrointestinal blockages, infections, constipation, and nutritional deficiencies (e.g., iron, zinc) which may be contributing to the Pica.

Audiological Assessment: Formal evaluation of hearing capacity to rule out auditory processing issues that may be contributing to his non-verbal status and poor responsiveness.

Speech and Occupational Therapy: Integration of specialized therapies to address communication deficits and to improve fine and gross motor coordination.

Educational Placement and Planning

Specialized Enrolment: Tinashe should be enrolled in a specialized institution or Resource Unit equipped to support neurodiversity learners, following the successful establishment of toilet training.

Individualized Education Plan (IEP): A tailored IEP must be developed immediately upon enrolment, addressing his cognitive, behavioural, and adaptive needs, including formal goals for communication, Pica reduction, and motor skills.

Behavioural and Environmental Management

Applied Behaviour Analysis (ABA): Implement ABA techniques focused on reducing the frequency and severity of Pica behaviours.

Positive Reinforcement: Use positive reinforcement strategies (e.g., verbal praise, small rewards) to encourage safe play, the avoidance of non-food items, and compliance with toilet routines.

Environmental Safety: Ensure constant, rigorous supervision, especially outdoors, and restrict or remove access to all non-food items such as sand, stones, and small objects from his environment. Install barriers where necessary to prevent injury.

Communication and Adaptive Skills

Augmentative and Alternative Communication (AAC): Introduce and expand the use of AAC tools, such as picture exchange systems (PECS) or communication boards, to build functional expressive communication.

Toilet Training and Routine: Establish a predictable and structured toilet schedule (e.g., after meals), using visual prompts and reinforcement to promote routine and compliance.

Caregiver Empowerment: Provide comprehensive training to caregivers on behaviour management, communication strategies, and environmental safety to ensure consistency of care across all settings.

Ethical Considerations

The assessment was conducted confidentially. Tinashe's name was anonymised for the report.

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