

Geophagia (Pica) Could Be Consideration a Substrate for Addiction?

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ABSTRACT

Features of ingestion of a large amount of soil or non-nutritive substance are found more frequently in children who spend a great deal of time outdoors as a feature of hand-to-mouth activities, although such behaviour is quite rare in adulthood. Geophagia is an intentional, chronic, and often non-addictive consumption of soil. It has a number of features similar to those of addictive disorders; thus, this case series emphasizes this view, challenging the classification of pica as an eating disorder.

Key words: Pica, eating disorder, substrate of addiction

INTRODUCTION

Pica, a debated psychiatric disorder, is culturally accepted in children but becomes pathological when linked to medical issues like iron deficiency anemia [1]. Pica holds a unique position in the nosology of psychiatric disorders as it is socially normative, culturally acceptable and even a normal in some developmental stages of a child. Thus the declaration of pica as a

disease entity had been up for much debate. But when it is outkeeping with the social and cultural atmosphere and even the developmental stages of a child, it can be labeled as pathological as it is a manifestation of underlying medical morbidities the most common of which is iron deficiency anemia and will lead to medical and surgical complications like intestinal obstructions [2]. If we look at pica as an illness, it bears the distinct marks of dependence which is most commonly seen in addiction. The following case series will further highlight the view that pica can be more of an addiction sub-type rather than an eating disorder [3]. A case series emphasizes this view, challenging the classification of pica as a disease entity.

CASE 1

A 19-year-old unmarried female, graduate in engineering, belonging to a urban background with easy going temperament, with similar presentation in the first degree relative, came with excessive desire of ingestion of white chalk, pencil tips, slate pencil in increasing amounts (upto 5 pencils a day), despite of being aware of the ill

effects of such non-nutritional substances. She found difficult to quit. Most of the time, she would replace her usual food amount with the above-mentioned materials. She would express features of irritability, uneasiness and sense of incompleteness when she would not take her usual amount. Subsequently over the years this led to weakness, fatiguability, decreased appetite and marked decline in socio-occupational functioning which lead her to take action for treatment. Detailed assessment of the patient has been given in Table 1 about laboratory investigations. Blood hemogram has been shown separately in Table 2.

CASE 2:

A 42-year-old married female, graduate in science, government servant (clerk), hailing from rural background, with anankastic personality, family history of suicidality in mother and oppositional defiant disorder in elder son, similar illness in younger son, with significant psychic-social stressors in the form of divorce from her previous husband and current husband sustaining spinal injuries amounting to financial stress with poor support system. She complained of extreme desire of eating mud, old grains of rice, toys of her children made of clay material, in increasing amounts. As per patient, eating such materials would relieve her anxiety to some extent, initially, but subsequently over use, this has become a part of her usual diet material. She would carry mud in her bag all the time. She would complain of uneasiness, distress, mounting worries whenever she would not take these

materials and remain preoccupied about the same despite knowing the ill consequences of the substances. Eating such material made her weak and dull in her activities leading to decline in the usual functioning which prompted her to seek treatment after 1 year. Detailed assessment of the patient has been given in Table 1 about laboratory investigations. Blood hemogram has been shown separately in Table 2.

CASE 3:

A 39-year-old unmarried female, Class 10, hailing from urban background with a well-adjusted personality, presented with a regular consumption of pencil and chalks for last 29 years, followed by frequent desire of consumption of baked dry mud and enjoying it. Gradually it became difficult to curb her urge to consume mud. She would feel embarrassed in taking such substances in presence of family members/ friends but she hardly abstains from eating mud for few hours. She would show irritability, uneasiness and dysphoria and lot of stress when she would not consume mud at her usual amount or at times it was difficult for its accessibility. To curtail certain distress, she would at times smell the vehicle’s exhaust fumes. Over last few months, her intake increased and she had sleep and appetite disturbances along with significant social dysfunction and extreme pressure from the family members to seek treatment. Detailed assessment of the patient has been given in Table 1 about laboratory investigations. Blood hemogram has been shown separately in Table 2.

	General physical examination	Weight (in kg)	Hemogram	LFT	KFT	Urine drug screening	Ultrasonography abdomen	Stage of motivation
Case1	Pallor (+)	36	Hb- 7.9mg/dl, MCHC- 45%, RDW-13.5	Within normal limits	Within normal limits	Negative for opioid, cannabis, amphetamine, benzodiazepine, etc.	Normal study	Action

Case 2	Pallor(+)	43	Hb- 3.5mg/dl, MCV- 64fL, MCH- 20.27pg, MCHC- 28.59%, RDW- 17, Serum iron- 25mcg/dl, serum ferritin- 10ng/dl, TIBC- 500mcg/dl, transferrin saturation- 13%.	Within normal limits	Within normal limits	Negative for opioid, cannabis, amphetamine, benzodiazepine, etc.	Normal study	Contemplation
Case 3	Pallor(-)	57	Hb- 6.7mg/dl, MCV- 70fL, MCH- 25.27pg, MCHC- 29.59%, RDW- 14.4.	Within normal limits	Within normal limits	Negative for opioid, cannabis, amphetamine, benzodiazepine, etc.	Normal study	Precontemplation

DISCUSSION

These cases were presented here after their verbal and informed consents, expressed a strong desire for mud, escalating quantities, continuing to take despite awareness of harmful effects and exhibiting withdrawal symptoms like irritability and weakness when abstaining. In all the above-mentioned cases, pica could have started as a learned behaviour as all of them had models in their youth. A corollary from this fact might also be that pica has underlying cultural associations which had gone undetected throughout the annals of time. It definitely shows that the prevalence of pica is much more than what is stated due to the stigma and the shame that is attached to it. Even like drug paraphernalia, they would also get excited when passing a seller selling toys, seeing paper for the act of drawing of which using pencils in a mandatory and inevitable part, seeing pots and even seeing masons build walls in their homes. Similar to addiction, excitement manifested at stimuli associated with mud consumption as was seen by Sarah L Young. Dependency is evident raising the question it is a form of addiction more than an eating disorder [4] Two cases showed iron deficiency, a common pica feature. Behavioral therapies

yielded positive responses, emphasizing a potential link between pica and addiction. Future studies may explore neurobiological aspects [5], including the dopaminergic system's role in iron deficiency as they both share the same receptors in mesolimbic pathway. Addiction is known to affect the dopaminergic system especially in the pathway of ventral tegmental area with nucleus accumbens. This system also lights up during activities needed for human survival like eating, fighting, reproducing. Feelings of reward and pleasure are thought to derive from the interface of the dopamine motive system with opioid receptors and serotonergic networks and there are receptors for homeostatic ligands such as leptin, ghrelin, orexin, glucagon-like peptide, and insulin scattered throughout the system. So, even though the neurobiology of pica may be difficult to establish due to largely heterogenous groups of people and lack of research, this may be a proposed mechanism. So, there is a distinct and unmistakable link between pica and addiction at least from the phenomenological aspect of both the disorders. It should also be noted that the iron deficiency linked with pica can also be explained by the dopaminergic system as it has been seen that iron and dopamine

receptors in the brain largely overlap. Further studies may delve further into such aspects of pica and this would change the way we see pica as a disorder [6].

CONCLUSION

In conclusion, the presented case series sheds light on the complex nature of pica, challenging its traditional classification as a mere eating disorder and proposing a connection with addiction. The cases highlight the profound impact of pica on individuals' lives, detailing escalating desires, withdrawal symptoms, and significant social dysfunction. The cases also underscore the prevalence of pica, often hidden due to societal stigma and shame. Furthermore, the cases reveal a commonality in iron deficiency, a known feature of pica. The proposed link between the dopaminergic system and iron deficiency suggests a potential neurobiological aspect that warrants further exploration. Understanding the neurobiology of pica could provide valuable insights into its underlying mechanisms and challenge the current perception of the disorder. In essence, this case series prompts a re-evaluation of pica, urging researchers and clinicians to consider its potential ties to addiction and delve into the neurobiological aspects. The findings open avenues for future studies that may redefine our understanding of pica and pave the way for more effective therapeutic interventions.

Declaration by Authors

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