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Socio clinical assessment of hemoglobin level in childrens suffered from Pica condition in north Bihar region

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Abstract
Pica is a disorder that occurs when children persistently eat one or more non-food substances over the course of at least one month. Pica may not sound like a dangerous problem, but when you consider that the non-food substances that are ingested are frequently toxic or otherwise harmful to the human body, the potential for illness and even death becomes clear. Pica may result in serious medical problems, such as intestinal blockage, poisoning, parasitic infection, and sometimes death. The typical non-food substances that children with pica ingest tend to vary with age. Younger children with Pica frequently eat paint, plaster, string, hair, or cloth. In contrast, older children with Pica tend to eat animal droppings, sand, insects, leaves, or pebbles. Despite the widespread prevalence of pica and its association with multiple health issues, little is known about its causes and consequences. The aetiology is still a matter of debate. Hence the present study was planned for socio clinical assessment of hemoglobin level in childrens suffered from pica condition.
The study was planned in Department of Paediatrics, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar. Total 50 cases of the Pica conditions were evaluated in the present study.
The data generated from the present study concludes that Pica is a common problem in children but most of the parents think that this is a problem related to the age of the children. There was no difference in prevalence of pica practice between various levels of education. However, women with history of pica practice reported tendency to repeat the practice. Different types of pica practice partly indicated socio-economic status of an individual. Nutritional status and dietary patterns of women with pica practice and those without pica practice were not significantly different.

Keywords: PICA, hemoglobin levels, Socio Clinicalcondition, etc

Introduction
Pica is a psychological disorder characterized by an appetite for substances that are largely non-nutritive, such as ice (pagophagia); hair (trichophagia); paper (xylophagia); drywall or paint; sharp objects (acuphagia); metal (metallophagia); stones (lithophagia) or soil (geophagia); glass (hyalophagia); feces (coprophagia); and chalk.
According to DSM-V (Diagnostic and Statistical Manual of Mental Disorders, 5th Edition) criteria, for these actions to be considered pica, they must persist for more than one month at an age where eating such objects is considered developmentally inappropriate, not part of culturally sanctioned practice, and sufficiently severe to warrant clinical attention. It can lead to intoxication in children, which can result in an impairment of both physical and mental development. In addition, it can also lead to surgical emergencies due to an intestinal obstruction as well as more subtle symptoms such as nutritional deficiencies and parasitosis. Pica has been linked to other mental and emotional disorders. Stressors such as emotional trauma, maternal deprivation, family issues, parental neglect, pregnancy, and a disorganized family structure are strongly linked to pica as a form of comfort [1].
Pica is most commonly seen in pregnant women, small children, and persons with developmental disabilities such as autism. Children eating painted plaster containing lead may suffer brain damage from lead poisoning. There is a similar risk from eating soil near roads that existed before tetraethyllead in petrol was phased out (in some countries) or before people stopped using contaminated oil (containing toxic PCBs or dioxin) to settle dust. In addition to poisoning, there is also a much greater risk of gastro-intestinal obstruction or tearing in the stomach. Another risk of eating soil is the ingestion of animal feces and accompanying parasites. Pica can also be found in other animals and is commonly found in dogs [2] and cats.
Complications may occur due to the substance consumed. For example, lead poisoning may result from the ingestion of paint or paint-soaked plaster, hairballs may cause intestinal obstruction and Toxoplasma or Toxocara infections may follow ingestion of feces or dirt [3].
According to the DSM 5, mineral deficiencies are occasionally associated with pica; however, biological abnormalities are rarely found in individuals with pica. People practicing forms of pica, such as geophagy, pagophagy and amylophagy, are more likely anemic, have low hemoglobin concentration in their blood, lower levels of red blood cells (hematocrit), or have lower plasma zinc

levels. Specifically, practicing geophagy is more likely to be associated with anemia or low hemoglobin. Practicing pagophagy and amylophagy were more highly associated with anemia. Additionally, being a child or pregnant woman practicing pica was associated with higher chance of being anemic or having low hemoglobin relative to the general population. More recently, cases of pica have been tied to the obsessive–compulsive spectrum, and there is a move to consider OCD in the cause of pica. However, pica is currently recognized as a mental disorder by the widely used Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Sensory, physiological, cultural and psychosocial perspectives have also been used by some to explain the causation of pica.[citation needed] It has been proposed that mental-health conditions, such as obsessive-compulsive disorder (OCD) and schizophrenia, can sometimes cause pica [4].

However, pica can also be a cultural practice not associated with a deficiency or disorder. Ingestion of kaolin (white clay) among African-American women in the US state of Georgia shows the practice there to be a DSM-IV "culture-bound syndrome" and "not selectively associated with other psychopathology". Similar kaolin ingestion is also widespread in parts of Africa. Such practices may stem from health benefits such as the ability of clay to absorb plant toxins and protect against toxic alkaloids and tannic acids [5].

There is no single test that confirms pica. However, because pica can occur in people who have lower than normal nutrient levels and poor nutrition (malnutrition), the health care provider should test blood levels of iron and zinc. Hemoglobin can also be checked to test for anemia. Lead levels should always be checked in children who may have eaten paint or objects covered in lead-paint dust. The health care provider should test for infection if the person has been eating contaminated soil or animal waste [6].

Treatment for pica may vary by patient and suspected cause (e.g., child, developmentally disabled, pregnant or psychogenic) and may emphasize psychosocial, environmental and family-guidance approaches, iron deficiency may be treatable though iron supplement through dietary changes. An initial approach often involves screening for and, if necessary, treating any mineral deficiencies or other comorbid conditions. For pica that appears to be of psychogenic cause, therapy and medication such as SSRIs have been used successfully. However, previous reports have cautioned against the use of medication until all non-psychogenic causes have been ruled out [7].

Looking back at the different causes of pica related to assessment, the clinician will try to develop a treatment. First, there is pica as a result of social attention. A strategy might be used of ignoring the person's behavior or giving them the least possible attention. If their pica is a result of obtaining a favorite item, a strategy may be used where the person is able to receive the item or activity without eating inedible items. The individual's communication skills should increase so that they can relate what they want to another person without engaging in this behavior. If pica is a way for a person to escape an activity or situation, the reason why the person wants to escape the activity should be examined and the person should be moved to a new situation. If pica is motivated by sensory feedback, an alternative method of feeling that sensation should be provided. Other non-medication techniques might include other ways for oral stimulation such as gum. Foods such as popcorn have also been found helpful. These things can be placed in a "Pica Box" that should be easily accessible to the individual when they feel like engaging in pica [8].

Behavior-based treatment options can be useful for developmentally disabled and mentally ill individuals with pica. Behavioral treatments for pica have been shown to reduce pica severity by 80% in people with intellectual disabilities. These may involve using positive reinforcement normal behavior. Many use aversion therapy, where the patient learns through positive reinforcement which foods are good and which ones they should not eat. Often treatment is similar to the treatment of obsessive compulsive or addictive disorders (such as exposure therapy). In some cases treatment is as simple as addressing the fact they have this disorder and why they may have it. A recent study classified nine such classes of behavioral intervention: Success with treatment is generally high and generally fades with age, but it varies depending on the cause of the disorder. Developmental causes tend to have a lower success rate [9].

The prevalence of pica is difficult to establish because of differences in definition and the reluctance of patients to admit to abnormal cravings and ingestion, thus leading to the prevalence recordings of pica among at-risk groups being in the range of 8% and 65% depending on the study [10]. Based on compiled self-report and interview data of pregnant and postpartum women, Pica is most prevalent geographically in Africa, with an estimated prevalence of 44.8%, followed by North and South America (23.0%) and Eurasia (17.5%). Factors associated with Pica in this population were determined to be anemia and low levels of education, both of which are associated with low socioeconomic backgrounds. Two studies of adults with intellectual disability living in institutions found that 21.8% and 25.8% of these groups suffered from pica [11].

Prevalence rates for children are unknown. Young children commonly place non-nutritious material into the mouth. This activity occurs in 75% of 12-month-old infants, and 15% of two-to-three-year-old children. In institutionalized children with mental retardation, pica occurs in 10–33% [12].

Various infections and parasitic infestations, ranging from mild to severe, are associated with the ingestion of infectious agents via contaminated substances, such as feces or dirt. In particular, geophagia has been associated with soil-borne parasitic infections, such as toxocariasis, toxoplasmosis, and trichuriasis.

Nutritional effects may also be evident. Theories regarding the direct nutritional effects of pica are related to characteristics of specific ingested materials that either displace normal dietary intake or interfere with the absorption of necessary nutritional substances. Nutritional

effects that have been linked to severe cases of pica include iron and zinc deficiency syndromes; however, the data are only suggestive, and there is no firm empiric evidence to support these theories [13].

A meta-analysis of 43 studies including 6,407 individuals with pica behaviors and 10,277 controls found pica to be associated with 2.35 greater odds of anemia and low hemoglobin (Hb), hematocrit (Hct), or plasma zinc (Zn) concentrations [14].

Pica is a disorder that occurs when children persistently eat one or more non-food substances over the course of at least one month. Pica may not sound like a dangerous problem, but when you consider that the non-food substances that are ingested are frequently toxic or otherwise harmful to the human body, the potential for illness and even death becomes clear. Pica may result in serious medical problems, such as intestinal blockage, poisoning, parasitic infection, and sometimes death. The typical non-food substances that children with pica ingest tend to vary with age. Younger children with Pica frequently eat paint, plaster, string, hair, or cloth. In contrast, older children with Pica tend to eat animal droppings, sand, insects, leaves, or pebbles [15]. Despite the widespread prevalence of pica and its association with multiple health issues, little is known about its causes and consequences. The aetiology is still a matter of debate. Hence the present study was planned forsocio clinical assessment of hemoglobin level in childrens suffered from pica condition.

Methodology

The study was planned in Department of Paediatrics, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar. Total 50 cases of the Pica conditions were evaluated in the present study.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study.

Inclusion Criteria

- All under five children having history of Pica attending pediatric department during study period.
- Parents were willing to take part in the study.
- Parents were able to understand Hindi or English.

Exclusion Criteria

- Children with mental sub normality were excluded from the study
- Under five children having congenital problems.
- Under five children having developmental delay.
- Under five children whose parents are not willing to participate in the study.
- Children of less than one year and more than five years of age.

Results and discussion

PICA is the persistent craving for inedible substances which is inappropriate to the developmental level and not a part of clinically sanctioned practice. It is most commonly reported in the children throughout the world. The prevalence of pica varies depending on the definition of pica, characteristics of the population sample and the methods used for data collection [16].

The sensory and physiologic theories center on the finding that many patients with pica say that they enjoy the taste, the texture or smell of the item they are eating. They use these items to lleviate nausea and feel a sense of fullness while trying to lose weight. Instead of eating food items which are absorbed into the system as calories, they choose nonfood items that pass through the system without being absorbed. This way they can fill full, but they do not gain weight. While this might not begin as a compulsion, continued practice may turn into pica eating disorder.

Under five children tend to establish eating habits during the first 2 to 3 years of life. During childhood, the eating preferences and attitudes related to food habits are established by family influences and culture. Unhealthy diets are common among lower income families, often because of the lack of nutritious fresh fruits and vegetables and adequate milk and protein intake. In addition, the lifestyles of homeless and migrant children place these populations at risk for inadequate food, causing nutrient deficiencies, developmental and growth delay, depression, hunger and behaviour problem.

Table 1: Age & Sex

Age	Number of Cases
1 to 2 year	18
2 to 3 years	21
3 to 4 years	6
4 to 5 years	5
Total	50
Sex:	
Males	22
Females	28
Total	50

Table 2: Education status of parents

Parameters	Mother	Father
No formal education	4	3
Up to Primary education only	14	13
Up to Secondary education only	19	18
Up to Higher Secondary education only	9	11
Graduation and above	4	5
Total	50	50

Table 3: Fees Types

Feed Type	No. of Cases
Breast Feeding:	
Yes	23
No	27
Complementary Feed:	
Yes	21
No	29

Table 4: Complaints

Presenting complains	No. of Cases
Pica (direct)	11
Pica (indirect):	
Fever	9
Cough/cold	6
Pain abdomen	9
Poor appetite	7
Loose motion	3
Vomiting	2
Lethargy	2
Passing worms in stool	1
Total	50

Table 5: Type of Material Used

Material	No. of Cases
Clay/sand/mud/plaster	34
Uncooked rice/pulses	16
Papers	13
Cloths	10
Uncooked vegetable	15
Pencil/rubber/chalk	12

Table 6: Hemoglobin Level

Hemoglobin level	No. of Cases
More than 12(Normal)	11
10-12gm/dl(Mild anemia)	18
7-10gm/dl(Moderate anemia)	12
Less than 7 gm/dl(Severe anemia)	9
Total	50

Prevalence of pica is difficult to establish because of differences in definition and reluctance of patients to admit to abnormal cravings and ingestion [17]. Prevalence rates vary from place to place and has been reported to range from 8% to 68% depending on the characteristic of the population studied [18].

In a study involving 553 urban pregnant women, African-American women (Edwards *et al*., 1994) [19] reported that 8.1% of their respondents practiced pagophagia. No geophagia was reported. A similar low prevalence rate of 8.8% involving geophagia and pagophagia was documented by Al-Kanhal and Bani in 1995 [20] in a study involving 321 pregnant Saudi Arabian women. Other investigators who reported low pica prevalence rates include Smulian *et al*., (1995) who documented 14.4% prevalence in a sample of 125 women from rural obstetric population in Columbus, USA; and Walker *et al*., (1995) [22] who recorded 2.2% and 1.6% prevalence rates respectively from the Indian and Caucasian pregnant women.

Halsted [21] summarized findings from research studies that have reported prevalence of pica ranging from 10% in young white children in a given clinic to 75% in a group of pregnant African women. African women in low socio-economic groups were considered by Halsted to have pica prevalence of approximately 40% to 50% with lower rates in white women.

Some studies carried out in western societies reported high prevalence rates in their subjects. Lacey [22], for example, recorded 38.0% prevalence in a study involving 128 antenatal women in Greenville, USA. He documented that African-American women reported practicing pica more than other ethnic groups in their study. Also, about 8.6% of respondents reported practicing polyphagia, that is, the ingestion of more than one substance. Similar rates were recorded by Simpson *et al*., (1994) whose study revealed a prevalence of 44% and 31% pica respectively in two groups of low-income women born in Mexico.

Highest prevalence rates involving mainly geophagia were reported in studies carried out in African countries. Walker *et al*., [22] reported 38.3% and 44% pica prevalence rates respectively among the urban and rural South African pregnant women in their study. In Nigeria, Sule and Madugu [24] documented 50% pica prevalence among pregnant women in Zuria. In Jamaica, a study on the dietary habits of rural women during pregnancy, noted that 15 out of the 38 pregnant women questioned reported cravings. Common cravings included; stone (20%), cigarette ash (13.3%), and drinking soda (13.3%) Melville and Frances. [25]

Most writers reported pica to be associated with severe iron deficiency anaemia in up to half of patients. In a survey of urban slums, 31% of children with anaemia had pica. A study conducted to assess the association of pica with iron deficiency stated that iron deficiency anaemia is three times more common in clay eaters; clay and starch absorb iron and prevent its absorption by the body. A study assessing impacts of iron deficiency stated that abnormal eating behaviour may either be the cause or the effect of iron deficiency. It has been observed that iron therapy can accelerate the cessation of these generally self-limited aberrations of behavior [26].

In children aged 18 months to 2 years, the ingestion and mouthing of non-nutritive substances is common and is not considered to be pathologic. Pica is observed more commonly during the 2nd and 3rd years of life and is considered developmentally inappropriate in children older than 18-24 months. Research suggests that pica occurs in 25%-33% of young children and 20% of children seen in mental health clinics. Pica typically occurs in equal numbers of boys and girls; however, it is rare in adolescent and adult males of average intelligence who live in developed countries [27].

Conclusion

The data generated from the present study concludes that Pica is a common problem in children but most of the parents think that this is a problem related to the age of the children. There was no difference in prevalence of pica practice between various levels of education. However, women with history of pica practice reported tendency to repeat the practice. Different types of pica practice partly indicated socio-economic status of an individual. Nutritional status and dietary patterns of women with pica practice and those without pica practice were not significantly different.

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