

A study to access the hemoglobin level and sociodemographic profile of under five children having Pica

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Abstract

Introduction: 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 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. **Method:** This prospective study was undertaken at a pediatric outdoor department Career Institute of Medical Sciences Lucknow since Jan 2019 to Mar 2019. All the under five years children visiting pediatric clinic with direct or indirect history of pica were enrolled for the study. The mothers were interviewed in depth regarding their sociodemographic profile and Hemoglobin level of all the children done. **Results:** In our study most of the children belongs to the age group 12-24 months 66(36.67%). Most of the parents were educated upto secondary education only and belong to joint families. Children belongs to rural area 111(61.6%) were more in number and Only 87(48.33%) of the children were exclusive breast fed. In our study only 20.56% children have normal hemoglobin level while 79.44% children have hemoglobin level below 12.0gm/dl and classified as anemic children, out of which 35.56% children have mild anemia, 25.00% children have moderate anemia and 18.89% children had severe anemia. **Conclusion:** Pica is mostly related with micronutrient deficiencies. Because of lower breastfeeding rate and delayed starting of complementary feeding the children are prone for micronutrient deficiencies leading to pica behavior in children. Knowledge of pica is the key for prevention.

Key words: Pica, Complementary feeding, Micronutrient deficiency.

Introduction

The word pica comes from the Latin word for magpie, a bird with a reputation for eating practically anything. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition, defines pica as persistent eating of nonnutritive substances for at least 1 month that is inappropriate to developmental level and not part of a culturally supported or socially normative practice [1].

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 [2].

Exploration of objects by mouthing and tasting is a part of normal, healthy development and is not considered pathological pica behavior. Pica is suspected only when (a) nonfood items are consumed repeatedly over the course of a month or long, despite efforts to curtail the behavior; (b) the behavior is considered inappropriate for the individual's developmental age (i.e., beyond the 18-month level); (c) it is not a cultural practice; and (d) the behavior is a symptom of another mental disorder and is of sufficient concern to warrant medical attention

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(American Psychiatric Association, 1994)[3]. Pica has been shown to be the predisposing factor in accidental ingestion of poisons. The ingestion of bizarre or unusual substances also have been resulted in many potentially threatening toxicities such as gastrointestinal, including mechanical bowel problems, ulcerations, recurrent chest infections, anemia etc(2-5). Lead toxicity is the most common poisoning associated with pica [4]. In the light of these facts this study was planned and executed.

Aims and Objective

To study the demographic profile, and anemia status by using hemoglobin level of under five children having pica and to educate the parents about pica and its consequences.

Material and Methods

Type of study & Setting: This prospective study was undertaken at a pediatric out patient department Career Institute of Medical Sciences Lucknow from Jan 2019 to Mar 2019.

Sampling method: The convenient sampling technique was adopted for the present study. Sample size was 180.

Sampling technique: simple random sampling technique used for the study

Inclusion Criteria The study includes:

- 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.

Results

From January-2019 to till march-2019 we had enrolled total 180 underfive children with complain of pica, number of male children 98(54.4%) outrages the females 82(45.56%), figure-1 depicts that in our study most of the children belongs to the age group 12-24 months and they are 66(36.67%) while children of age group of 48-60 months were least in numbers that is 37(20.56%).

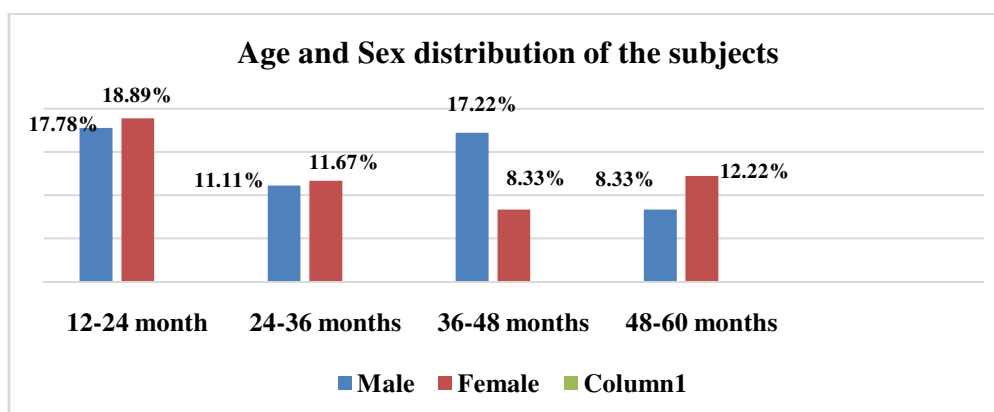


Figure-1: Age & Sex Distribution (n=180)

Exclusion Criteria The study excludes:

- 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.

Statistical Analysis: Descriptive statistical method was used for data analysis. Frequency, percentage distribution, was used for demographic profile, breast feeding, complementary feeding and hemoglobin level.

Ethical consideration: Permission was taken from the ethical committee of the institute before starting the study. Verbal consent was taken from the parents of all participants before starting study.

The mothers were interviewed in depth regarding type of family, educational and working status, breast feeding and complementary feeding.

presenting complaint was asked. General physical, anthropometric and systemic examination and simple routine investigations done.

History about The material used for pica was taken. Health education given to each mother regarding breastfeeding, complementary feeding and Pica.

Table-1: Mother and father’s education status of the subjects.

| Mothers education | Total | Fathers education | Total |
|---------------------------------------|------------------|---------------------------------------|------------------|
| No formal education | 14(07.78%) | No formal education | 13(07.22%) |
| Up to Primary education only | 49(27.22%) | Up to Primary education only | 46(25.56%) |
| Up to Secondary education only | 70(38.89%) | Up to Secondary education only | 67(37.22%) |
| Up to Higher Secondary education only | 37(20.56%) | Up to Higher Secondary education only | 44(24.44%) |
| Graduation and above | 10(05.56%) | Graduation and above | 10(05.56%) |
| Total | 180(100%) | Total | 180(100%) |

Most of the parents of the children were educated upto secondary education only (table-1)

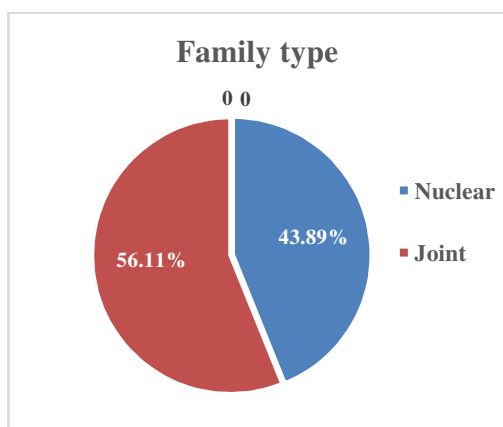


Figure-2: Family type of subjects

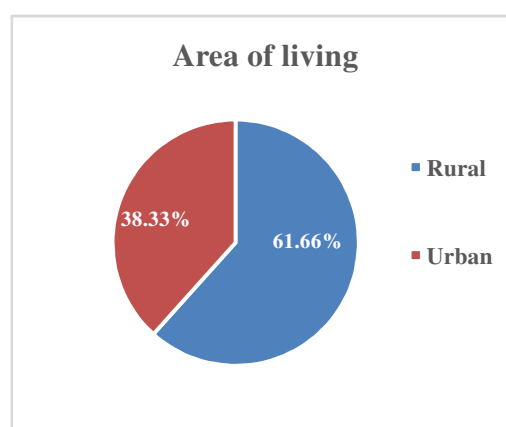


Figure-3: Area of living

Table-2: Exclusive breastfeeding status of the subjects.

| Age | Male | | Female | | Total |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Yes | No | Yes | No | |
| 12-24 months | 18(10.00%) | 14(07.78%) | 12(06.67%) | 12(06.67%) | 56(31.11%) |
| 24-36 months | 11(6.11%) | 09(05.00%) | 09(05.00%) | 12(06.67%) | 41(22.78%) |
| 36-48 months | 14(7.78%) | 17(09.44%) | 06(03.33%) | 09(05.00%) | 46 (25.56%) |
| 48-60 months | 07(03.89%) | 08(04.44%) | 10(5.56%) | 12(06.67%) | 37(20.56%) |
| Total | 50(27.78%) | 48(26.67%) | 37(20.56%) | 45(25.00%) | 180 (100%) |

Most of the under five children belong to joint families 101(56.11%). Children belongs to rural area 111(61.6%) were more in number and Only 87(48.33%) of the children were exclusive breast fed (table 2).

Table-3: Complementary feeding status of the subjects (started at 6 the age of 6 months).

| Age | Male | | Female | | Total |
|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Yes | No | Yes | No | |
| 12-24 months | 12(06.67%) | 20(11.11%) | 14(07.78%) | 10(05.56%) | 56(31.11%) |
| 24-36 months | 08(04.44%) | 12(06.67%) | 09(05.00%) | 12(06.67%) | 41(22.78%) |
| 36-48 months | 14(07.78%) | 17(09.44%) | 08(04.44%) | 07(03.89%) | 46 (25.56%) |
| 48-60 months | 06(03.33%) | 09(05.00%) | 09(05.00%) | 13(07.22%) | 37(20.56%) |
| Total | 40(22.22%) | 58(32.22%) | 40(22.22%) | 42(23.33%) | 180 (100%) |

Table-3 shows that timely starting of complementary feeding was only 80 (44.44%).

Table-4 Presenting complain in children (n=180).

| Presenting complains | Male | Female | Total |
|------------------------|-------------------|-------------------|------------------|
| Pica (direct) | 23(12.78%) | 17(09.44%) | 41(22.78%) |
| Pica (indirect) | | | |
| Fever | 12(06.67%) | 14(07.78%) | 26(14.44%) |
| Cough/cold | 14(07.78%) | 07(03.89%) | 21(11.67%) |
| Pain abdomen | 18(10.00%) | 16(08.89%) | 34(18.89%) |
| Poor appetite | 15(08.33%) | 11(06.11%) | 26(14.44%) |
| Loose motion | 04(02.22%) | 07(03.89%) | 11(06.11%) |
| Vomiting | 06(3.33%) | 03(01.67%) | 09(05.00%) |
| Lethargy | 03(01.67%) | 05(02.78%) | 08(4.44%) |
| Passing worms in stool | 03(01.67%) | 01(0.56%) | 04(2.22%) |
| Total | 98(54.44%) | 82(45.56%) | 180(100%) |

Only 41(22.78%) children have direct history of Pica as presenting complains while rest other children presented for various other complains like pain abdomen 34(18.89%), fever 26(14.44%), poor appetite 26(14.44%), cough 21(11.67%), loose motion 11(06.11%), vomiting 09(05.00%), lethargy 08(04.44%), passing worms in stool 04(02.22%) respectively in descending order.

Table-5: Type of material used for PICA (n=180).

| Material | Male | Female | Total |
|-----------------------|------------|------------|-------------|
| Clay/sand/mud/plaster | 66(36.67%) | 57(31.67%) | 123(68.33%) |
| Uncooked rice/pulses | 41(22.78%) | 26(14.44%) | 67(37.22%) |
| Papers | 27(15.00%) | 20(11.11%) | 47(26.11%) |
| Cloths | 18(10.00%) | 19(10.56%) | 37(20.56%) |
| Uncooked vegetable | 25(13.89%) | 28(15.56%) | 53(29.44%) |
| Pencil/rubber/chalk | 23(12.78%) | 24(13.33%) | 46(25.56%) |

Table 5 depicts that the material used for pica mostly was clay/sand/plaster 123(68.33%), uncooked rice/pulses 67(37.22%), uncooked vegetables 53(29.44%), papers 47(26.11%), pencil/rubber/chalk 46(25.56%) and cloths 37(20.56%)

Table-6: Children having Anemia (n=180).

| Haemoglobin level | Male | Female | Total |
|----------------------------------|-------------------|-------------------|------------------|
| More than 12(Normal) | 21(11.67%) | 16(08.89%) | 37(20.56%) |
| 10-12gm/dl(Mild anemia) | 37(20.56%) | 27(15.0%) | 64(35.56%) |
| 7-10gm/dl(Moderate anemia) | 23(12.78%) | 22(06.67%) | 45(25.00%) |
| Less than 7 gm/dl(Severe anemia) | 17(09.44%) | 17(09.44%) | 34(18.89%) |
| Total | 98(54.44%) | 82(45.56%) | 180(100%) |

In our study only 37(20.56%) children had normal hemoglobin level while 64(35.56%) children have mild anemia, 45(25.00%) children have moderate anemia and 34(18.89%) children had severe anemia (table-6).

Discussion

Pica is a quiet old condition but still pica remains a mysterious and fascinating occurrence. It seems to be strongly associated with iron deficiency anemia, and in the majority of cases the unusual eating and chewing behavior disappears upon iron supplementation [5,6,7,8]. Several hypotheses exist about why iron deficiency causes pica, including physiological mechanisms; however, there is no single agreed upon explanation [9]. When associated with iron deficiency, it is believed to be a symptom of the deficiency rather than its cause [9]. Occasionally, pica practices cause other nutritional deficiencies such as hypokalemia (clay and Kayexalate ingestion [10]).

There have been several theories explaining the causes of pica. Earlier investigators proposed that pica practices compensated for nutritional deficiencies, such as iron or zinc, but this idea was discarded as ice, rubber, foam and several other items, consumed by those who practice pica, do not have any known nutritional value [11]. Interestingly, pica is practiced when a patient is least supervised. Patients are also secretive of their pica habits and are often reluctant to mention it. Pica symptoms will thus go unnoticed unless the physician specifically addresses them [12,13].

In our study the number of male children 98(54.4%) exceeds the number of female 82(45.56%) children just like the study done by R K Gupta and Bhatia et al where the percentage of male children were 60%, 58.82% and females were 40%, 41.18% respectively[14,15]. Because our institute is located in the rural area of the Lucknow district so the Children belongs to rural area 111(61.6%) were more in number.

Most of the parents were educated up to secondary class only. The exclusive breast feeding rate was only 48.33% and the complementary feeding started at the age of six month in only in 44.44%, because of lower breast feeding rate and delayed starting of complementary feeding the children are prone for micronutrient deficiencies leading to pica behavior in children [16] that is supported by study done by Singhi et al have demonstrated low levels of micronutrient like iron and zinc in children with pica[17].

In our study only 22.78% mothers had given direct history of Pica as presenting complain while in the study done by R K Gupta et al About 32% mothers gave direct history of pica as presenting complains[15]. pica is a behavioral problem of developing children so the chances of child coming to hospital with complain of

pica is less, most of the parents think that the problem of pica is related to the development and it will be corrected by its own as the child grow with time[16]. Some of the parents think that this problem is related with the micronutrient deficiencies so they come to hospital for the same. In the present study the material used for pica mostly was clay/sand/plaster in 68.33% because most of our study population belongs to rural area and the clay is easily available substance that's why used for eating. Our study finding is supported by the study of Bhatia et al, who had found in his study that 47.89% children were using clay to satisfy their pica behavior [15].

Pica is associated with many micronutrient deficiencies and vice versa. Most of the children with pica have parasitic infestation [18]. Because of these micronutrient deficiencies, parasitic infestation and problem in absorption of iron due to these materials children are prone for anemia [19]. In our study only 20.56% children have normal hemoglobin level while 79.44% children have hemoglobin level below 12.0gm/dl and classified as anemic children, out of which 35.56% children have mild anemia, 25.00% children have moderate anemia and 18.89% children had severe anemia.

These findings were supported by many studies suggestive of anemia in children like Bhatia et al., 2015 Ali, 2001; Hackworth & Williams, 2003; Lemaneck et al., 2002; Rose et al., 2000[16,19,20,21]. Certain substances are shown to interfere with absorption of iron by the body; however, pica is more often seen as a physiological response to a preexisting iron deficiency [16].

Nutritional deficiencies can also result when individuals substitute nonfood items for calorie-bearing, nutritive foods [21]. Some picas pose serious health risks, which include toxicity; intestinal infections and/or parasites; malnutrition, anemia, and other nutritional deficiencies; oral and dental health problems; and intestinal obstruction/ perforation [23,24,25]. Indirect complications include being avoided by others and the danger of bodily harm related to the process of searching for desired items. In certain cases, pica may be life threatening [26].

Nutrient supplements are often used to reduce pica in individuals with and without DD. Iron supplements are recommended most often, and reductions of pica occur in some cases [26,27,28]. Pica is also some what

effectively treated with zinc supplements. In an institution in North Carolina, 54% of residents with known pica behavior were judged to have low zinc levels. After supplementation, pica behavior decreased from 23 incidents to 4.3 incidents per person across a 2-week period [29].

Conclusion

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 and it will subside by its onbut many studies including ours also has shown that pica is mostly related with anemia and micronutrient deficiencies and if parents are aware about it this will lead to avoidance of Pica and improving the health status of the children. Educating parents about pica is most important for prevention and treatment of Pica.

First and second author were major contributor in the collection of data and planning of study, while third and fourth author helped in data collection and compilation of data.

What this study adds to existing knowledge: Present study recommends that exclusive breast feeding upto the age of 6 months and initiation of complementary feeding at 6months will be a preventive aspect of micronutrient deficiency leading to Pica. Knowledge about pica and its consequences are also very helpful to parents to avoid pica in their children.

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