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Impact of pica in pregnancy over feto maternal outcome at tertiary care centre in central Indian

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Abstract
Background: Pregnancy cravings are something that most people expect during the nine months of pregnancy. The old standard being pickles and ice-cream. The truth is that as many as 68% of pregnant will experience cravings usually due to hormonal changes. However, there is a condition called pica, when persons craves and consumes non-food substances. Identification of pica in pregnant women could contribute to detection of high risk group, where it is necessary to implement strategies as regard both the evaluation and nutritional education.
Aims and Objectives
1) To determine prevalence of pica in pregnancy among antenatal women at tertiary care centre in central India, Bhopal.
2) To determine commonly used pica substance during pregnancy.
3) To study and compare effect of pica over maternal outcome in women practicing pica during pregnancy
4) To study effect of pica over fetal outcome in women practicing pica during pregnancy and its comparison with controls.

Material and Method: It was prospective analytical study conducted at Sultania Zanana Hospital, Bhopal. Total number cases were 1000 pregnant women. Cases were selected by inclusion and exclusion criteria. analysis was done by chi-square test and student t test for contineous independent variables.
Observation: Total cases were 1000 out of which 38% had prevelance of pica. Most common pica substance were soil, clay and chalk, pica found more common among rural women. There were no significant adverse effects found in Pregnancy Pica over maternal and fetal outcome.
Conclusion: Pica apperas to be complex behavior. Issues related to pica as craving, it's application as an addictive process and it's amelioration by iron therapy are suggestive of the need to study pica as a generalised mechanism and relationship should be explored for the potential of improving understanding of other addiction such as cigarettes, alcohol or illicit drugs.

Keywords: pica, cravings in pregnancy, geophagia, nutritional deficiencies

Introduction
Pregnancy cravings are something that most people expect during the nine months of pregnancy. The old standard being pickles and ice-cream. The truth is that as many as 68% of pregnant will experience cravings usually due to hormonal changes. Throughout pregnancy, as the different hormones fluctuate, women may find that they are sensitive to the smells of certain foods, actually to the point of nausea. However, there is a condition called pica, when persons craves and consumes nonfood substances. It's diagnosis which only consist of questioning is omitted during prenatal care probably because most health professionals have no knowledge about this disorder. Identification of pica in pregnant women could contribute to detection of high risk group, where it is necessary to implement strategies as regard both the evaluation and nutritional education. Habit of pica poses health risk associated with malnutrition, sanitation and personal injury all among the usual concern of public health. As public health problem, it is most timely to examine the issues of concern, provide documentation from related literature and offer hypotheses for further study. There have been no detailed studies in Indian population, we therefore conducted a study to assess its prevalence, substance commonly used and their impact over maternal and fetal outcome.

Aims and objectives
- To determine prevalence of pica in pregnancy among antenatal women admitted at tertiary

care centre in Central india To study the effect of pica over maternal outcome in women practicing pica during pregnancy and its comparison with controls.

- To study the effect of pica over fetal outcome in women practicing pica during pregnancy and its comparison with controls.
- To determine commonly used pica substance during pregnancy.

Materials and Methods

The present study entitled "Impact of pica in pregnancy - a case control study" is an observational study carried out in Department of Obstetrics & gynecology, Gandhi Medical College & Sultania Zanana Hospital, Bhopal (M.P.)

Table 1: Distribution of Obstetric History Among Cases and Control

OBS. history	No. of Cases	Percentage (%)	No. of Control	Percentage (%)
Primi Gravida	133	35%	248	40.67%
Multi Gravida	209	55%	322	52.45%
Grand Multi Para	38	10%	50	8%

Study Design: A hospital based case- control study.

Study Period: One year from 01 August.2012 to 30 july 2013.
Study Setting: Department of Obstetrics and Gynaecology, Gandhi Medical College and Sultania Zanana Hospital, Bhopal.

Study Population

1000 pregnant women admitted at Sultania Zanana Hospital, a tertiary care centre in Bhopal were recruited.
Nearly 80% obstetric population in Central India attend a public hospitals. Thus, this sample is likely to represent the obstetric population of central India.
Study cases included admitted antenatal women practicing pica in present pregnancy while control group consist of antenatal women not having history of pica in this pregnancy.

Survey Questions and data Collection

A survey questionnaire was prepared and demographic data were collected.
Study questions were limited to the most frequently mentioned pica items. Detailed ethnographic interview about pica were conducted on women who had professed pica behaviour. Pregnant women were asked about past and present pica behaviour, past and present obstetric morbidities, reproductive history and a general and systemic examination along with obstetric examination was carried out and neonatal outcome was noted following delivery.

Data Analysis

Data work entered into a Microsoft excels. Manual and automated checks were performed to ensure that data were consistent and within expected values. Testing for significant difference was done by using either the chi-square test for categorical independent variables and student t test for continuous independent variables.

Ethical Consideration

The study was reviewed and approved by institutional ethical committee for biomedical research on human participants of Gandhi Medical college, Bhopal.

Discussion

The present one year study entitled "Impact of pica in pregnancy among ante-natal women" admitted in a tertiary care centre, Department of Obstetrics and Gynaecology hospital and G.M.C., Bhopal between 1 July 20 12 - 30 August 2013.
In the study, 1000 admitted antenatal women were interviewed. Out of which 384 women who have practiced pica in present pregnancy were taken as cases. Contol group included rest 686 women who don't have history of pica in this pregnancy.

Prevalence

In this study we found that 38% of pregnant women had habit of pica.
The prevalence of pica in pregnancy reported from as low as 0% to as high as 68% in various studies.
However, pica behaviour is under reported because the ingestion of non-food items is considered as either shameful or unimportant and sometimes normal.
In a cross-section survey based in an antenatal clinic at Kilifi District Hospital coast province, Kenya, 56% pregnant women reported eating soil regularly.
The prevalence of pica during pregnancy was 49% in Ensenda group and 31% in southern California group in a study in pregnant Mexican born women done by Ellen Simpson [1], J Dennis Mull, Erin Londey and Joan East
Corbett, Robin Webb PhD [2], in their study in pregnant women found 38% of pica practicing women. African American women reported practicing pica more often than other ethnicities.
Also in study by Rainville [3], at University of Texas School of public health found that pica prevalence was 77.5% among Mothers aged 16-30 year with infant younger than 1 year of age.
According to a study in Zaria, Nigeria by Sule S *et al.* [4], prevalence of pica among pregnant was 50%.
A study by Edward *et al.* [5] in department of Nutritional science, Howard University, found 8.1% of women reporting pagophagia but none with geophagia.
A study done on pica in rural obstetric population by Smulian JC *et al.* [6] found 14.4% prevalence.
Similarly, a study on pica in privileged population by *Mikkelsen et al.* [7]. found that only 0.02% had pica in this cohort of well-nourished Danish Women.

Reasons for pica

Various reasons were given for pica ingestion most common being liking for that particular substance smell, taste and texture given by 48% of women.
23% of women said that they consume pica substance because it relieves their anxiety and nausea and helps in decreasing pain during less delivery.
12% of women states that they believe in god's blessing by ingesting that particular substance from sacred place i.e. soil or ash.
13% women couldn't provide reason but just consume it due to cravings.

Table 2: Pica Substances Commonly Used

Pica Substances	No. of Cases	Percentage (%)
Ground soil	182	48%
Clay	95	25%
Chalk	76	20%
Ica	3	1%
Other	22	6%
Polypica	38	10%

Past History

68% of women had positive past history, either in their child hood (50%) previous pregnancy or during some time in life.

Reid [8] also found that there was a significant association between pica in family friends or to members of the community and pica in the index pregnancy.

A study by Edwards *et al.* [5] found that childhood, family and non-pregnant history of pica behaviour was significantly associated with pica in pregnancy.

As per Horner RD [9], women at high risk have a positive childhood and family history.

Pica after puerperium

Most of the pregnant women stopped pica after delivery.

Morales Haye - Bautista also states that pregnant women stop having pica after delivery.

Maternal Outcome

This study found that pica affects pregnancy in various aspects.

40% of pica women had anaemia, 20% had hypertensive disorder of pregnancy, 10% suffered from GI disturbance.

Table 3: Maternal Outcome of Pica and Non Pica Women

Maternal Outcome	No. of Cases	Percentage (%)	No. of control	Percentage (%)
ANEMIA	152	40%	163	24.61%
Hypertensive Disorders of Pregnancy	76	20%	81	12.96%
G.I Distubances	38	10%	40	6.12%
Infection/ Parasite Infestation	19	5%	16	3.70%
Toxic Manifestation	0	0	0	0
Others	19	5%	0	0
No	76	20%	320	55.32%

A study done by Corbett *et al.* [2] said that women practicing daily pica practice were significantly more likely to have lower prenatal hematocrit than women who did not practice pica or who practiced pica less frequently than daily. No specific pregnancy complication was associated with the practice of pica.

Also in study by Sera L Young *et al.* [4] in Zanzibar, Tanzania, there was no difference in the prevalence of infection by current geophagy status. There were no differences in geohelminth infection by pica status. Similar relationship emerged when changes in parasite burden were examined by pica behaviour at any point in current pregnancy.

Geophagists had 0.08 gm/dl lower Hb than non-pica eaters (not significant). Amylophagist had 0.59 gram/dl lower Hb (P<0.011) and those who consumed uncooked rice and earth had 1.05 gram/dl lower Hb (P<0.001)

A similar negative association between Hb concentration and pica behaviour at the time of the baseline interview was found.

A significantly higher proportion of women who had eaten earth in the current pregnancy had experienced abdominal pain and constipation than non-geophagic women. A significantly higher proportion of women who had consumed uncooked rice at some point in the current pregnancy had experienced nausea and abdominal pain than those who had not. More women who had engaged in any form of pica had experience nausea, abdominal pain and constipation in this pregnancy than those who had not. There were no significant differences in loss of appetite, diarrhoea or omitting between the pica versus non-pica group.

According to Lopez *et al.* [10], they found that pica women are frequently associated with anaemia or iron deficiency during pregnancy.

Similarly, a study carried out in department of family medicine, Wayne state university, Detroit usa found that numerous complication of the disorder have been described especially iron deficiency anaemia, lead poisoning, and helminthic infestation. According to a study carried out at veteran's administration medical centre Durban, NC by Horner *et al.* [9], pica during pregnancy results in anaemia. Pica has also been associated with maternal and perinatal mortality.

Similarly a study by Rainville AJ [3]. at Houston usa concluded that women in pica group had lower haemoglobin level at delivery than women who did not report pica (P<0.01 for all pica versus no pica). There were no difference in mean weight or mean gestational age of infant born to women from pica group and non-pica group Also according to Saunders *et al.* [11] pica was associated with gestational anaemia (P< 0.09) and gestational intercurrence.

According to Edward, serum ferreting concentration of pica women were significantly lower during the 2nd and 3rd trimester of pregnancy and the average values for three trimesters of pregnancy for both ferreting and mean corpuscular haemoglobin was significantly lower in pica women than their non-pica counter parts.

Fetal Outcome

In this study 90% born neonates were full term while 10% were preterm. 7% were LBW rest of it were having weight appropriate for age. According to Saunder C *et al.* [11], pica did not interfere in the health parameter at birth: weight, gestational age and intercurrences.

Similarly study on pica in an urban environment by Edward *et al.* [5], found no difference on gestational age, body length and body weight were not different but head circumferences of infants delivered for pica women who consumed pica were smaller than those of non-pica women.

Table 4: Fetal Outcome Among Cases and Control Group

Fetal Outcome				
S.no	**No.**	**Cases %**	**No.**	**Control %**
FT	342	90%	570	92%
PT	38	10%	40	8%
<2kg	95	25%	124	20%
2-3kg	171	45%	310	50%
>3kg	114	30%	186	30%

Conclusion

From this study, the following conclusions were made.

The prevalence of pica in pregnancy is 38% in Sultania zanana hospital.

The most common pica substances ingested are soil, clay and chalk depending upon availability and preferences in contrast to western countries where ice-eating is common.

Pica woman are more prone to develop anaemia, hypertensive disorders of pregnancy and G1 disturbances. Most women had moderate anaemia, but pica is cause or effect remains inconclusive.

Significant proportion of Women practicing pica during pregnancy had past history of pica either in their childhood or previous pregnancy. Also, large proportion of woman has some family member or relative practicing pica.

Pica is slightly common among rural under privileged obstetric population. Family-income does not affect the pica behaviour rather, it change the substance ingested.

Pica is common in extremes of reproductive age group, which is more vulnerable for malnutrition. Apparently, pica seems to be common in multigravidas especially women with birth-order more than two, probably due to depleted sources in body.

Pica women are less educated while woman with higher education are less likely to ingest non-food items.

Maximum woman craved for smell, taste a texture of substance. While some of them took it in belief that it relieves their nausea/vomit and helps in smooth and less painful delivery. Small proportion of woman states that they practice it due to religious belief.

Most of pica woman started ingesting pica substance during 2nd trimester when body's nutritional requirements increase and took it on daily basis but this practice stopped spontaneously during puerperal period.

Common pica practice among pregnant woman apparently does not have any adverse effect on foetal outcome in the form of maturity/birth weight

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