

*Full length Research Paper*

# Prevalence of pica in pregnant women referred to health care centers in Zahedan, Iran (2002-2003)

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**Some pregnant women crave for non-food items with no nutritional value such as dirt, clay, paint chips, chalk, ice, etc. This is called pica. Most frequently, pica occurs in children, persons with mental retardation and women during their pregnancies or while they are breast-feeding. Pica is considered to be a serious eating disorder, sometimes resulting in serious health problems such as lead poisoning, bowel blockage and iron deficiency anemia. The prevalence of pica was studied in 560 pregnant women who were referred to the health centers in Zahedan. The prevalence of pica among pregnant women was 15.5%, in which 25.3% of them ate dirt, 60.9% ice, and others substances such as chalk, rosary praying clay, freezer frost, tea stuff and other non-food substances. Pica is not limited to any culture, race, sex or socio economic background. It can result in dangerous and serious health problems. Therefore, there is the need to raise public awareness of the adverse effects of this practice.**

**Key words:** Pica, prevalence, pregnancy, women, non-food substances.

## INTRODUCTION

Some pregnant women develop strong cravings for non-food substances of little or no nutritional value such as dirt, soap, cigarette ashes, chalk, ice, freezer frost, hair, starch, paint chips, burnt match heads, plaster, wax (Ellis and Schnoes, 2002; Callahan et al., 2000; Rainville, 1998; Worthington-Roberts and Williams, 1993; Walker, 1997; Lopez, 2004) clay, baking soda, tooth paste, coffee grounds, cigarette butts, paper, sand or gravel, rust, charcoal, antacids, mothballs and broken crockery (Ellis and Schnoes, 2002; Worthington-Roberts and Williams, 1993; Walker, 1997; Thomas, 1988). This common phenomenon is called pica. The term pica is derived from the Latin word magpie; a bird known to eat nearly anything (Walker, 1997; Woywodt and Kiss, 1999; Rose, 2000). Although, consumption of some items may be harmless, pica is considered to be a serious eating disorder, sometimes resulting in serious health problems such as lead poisoning, bowel obstruction, intestinal pain, parasitic infections, dental injury, iron deficiency anemia,

or in rare cases even death (Ellis and Schnoes, 2002; Worthington-Roberts and Williams, 1993; Rose, 2000; Edwards et al., 1994). The drawbacks associated with this condition depend largely on what and how much is consumed. Consumption of non-nutritious foods can interfere with healthy eating habits resulting in deficiencies in vitamin and mineral levels in the pregnant woman. Pica is associated with significantly lower maternal hemoglobin levels at delivery (Ellis and Schnoes, 2002; Rainville, 1998). Clay eating can cause ingestion of high levels of lead, too much or too little potassium and excessive phosphorus (Edwards et al., 1994). Pica of clay can bind potassium in the intestine, leading to severe hypokalemic myopathy. Clinicians caring for pregnant women with fatigue, muscle weakness, and hypokalemia should consider geophagia as a possible cause (Ukaonu et al., 2003). The ingestion of bizarre or unusual substances also has resulted in other potentially life-threatening toxicities, such as hyperkalemia following cautoptreyiophagia (the ingestion of burnt match heads) (Ellis and Schnoes, 2002). Iron deficiency anemia and less often potassium and zinc deficiency are the main complications of an excessive starch or clay ingestion, followed by gastrointestinal obstructions due to

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**Table 1.** Frequency of non-food substances consumed by pregnant women in Zahedan.

Non food item	Percentage	Total number
Clay and dirt	25.3	22
Chalk	2.3	2
rosary and praying clay	3.4	3
Ice	60.9	53
Freezer frost and ice	2.3	2
Tea stuff	1.2	1
Dirt and ice	3.4	3
Dirt, rosary and praying clay	1.2	1
Total pregnant women		560
Pregnant women with pica		87

gastroliths or impaction. Additionally, naphthalene poisoning (in pica for toilet air-freshener blocks), phosphorus poisoning (in matches pica), mercury poisoning (in paper pica) and lead poisoning (in dried paint pica) have been described (Menge, 1998). The exposure to infectious agents via contaminated ingested substances is another potential health hazard associated with pica, the nature of which varies with the content of the ingested material. In particular, geophagia has been associated with soil-born parasitic infections, such as toxoplasmosis and toxocariasis. Gastrointestinal (GI) complications, including mechanical bowel problems, constipation, ulcerations, perforations and intestinal obstructions have resulted from pica (Ellis and Schnoes, 2002). Ingestion of paint chips can bring about lead poisoning. Ice consumption obviously is not poisonous to the system; however there is evidence of low levels of iron in the blood in the second and third trimesters when a pregnant woman consumes 1/2-2 cups of ice daily or a few times per week (Edwards et al., 1994). Elevated magnesium blood concentrations can cause depressed maternal respiratory and cardiac rates or depressed fetal heart rate activity (Morales and Hayes-Bautista, 2000). Most frequently, pica occurs in women before or during their pregnancies or while they are breast-feeding. Pica also has been found among small children and people with epilepsy, mental retardation and mental illness (Ellis and Schnoes, 2002; Thomas, 1988). The incidence of pica during pregnancy has been reported to range from 0 to 68%, depending on the patients' population (Smulian et al., 1995). It had been suggested that pica during pregnancy occurs more frequently in people who exhibited similar practices during their childhood and non-pregnant states (Smulian et al., 1995; Horner et al., 1991). The exact cause of pica is often unknown (Ellis and Schnoes, 2002; Rose, 2000). It is a worldwide problem that has no barriers of age, race, sex or geographic region (Sayetta, 1986). Pica occurs throughout the world. It is a widespread practice in western Kenya, Southern Africa and India. Pica has been

reported in Australia, Canada, Israel, Iran, Uganda, Wales and Jamaica. In some countries, Uganda for example, soils are made available for purchase for the purpose of ingestion (Ellis and Schnoes, 2002; Menge et al., 1998). In Jamaican in 1992, in a study on the dietary habits of rural women during pregnancy, it was noted that 15 of the 38 pregnant women questioned reported craving to ingest stone. In Malawi, it was reported to be surprising for a pregnant woman not to practice pica, since this is how a woman knows that she is pregnant (Callahan et al., 2000). Pica frequently spontaneously remits in young children and pregnant women; however it may persist for years if untreated (Ellis and Schnoes, 2002). This study of pica in pregnant women in Zahedan was conducted to determine the prevalence of pica.

## MATERIALS AND METHODS

In a cross-sectional survey (with randomized multi stage sampling), the prevalence of pica was studied in 560 pregnant women that were chosen from five different health centers (in each center  $n = 112$ ). A structured interview was used to obtain information about pica behavior, mother's education level, income, job, numbers of children, gestational age, pregnancy rank, pica substances ingested and family history of pica.

All mean are presented as mean  $\pm$  SD. Chi-square and logistic regression was used to obtain the association between demographic variables, pica and age using SPSS 6.0 performed data collection. The data was analyzed by both descriptive and analytic analyses such as  $\chi^2$  and logistic regression.

## RESULTS

The relation between pica and the studied variables were assessed. The mean of age was  $24.7 \pm 5.6$  year and the pregnant women ranged in age from 14 to 42 years. The prevalence of pica among the pregnant women in the study was 15.5%. The frequency of non-food substances consumed by pregnant women is shown in Table 1. Most pregnant women consumed ice, dirt or both of them

(91.9%).

Mothers were grouped based on their education level. 26.8% of pregnant women were illiterate and 7.9% of them had higher education. The lowest prevalence of pica was related to the subjects with higher education (9.5%). The literacy level was not significantly associated with pica. 55% of the pregnant women in this study had less than 1 million Rials income per month, and 11.1% had more than 1.5 million Rials. There was no significant association between family incomes with pica. 38.2% of the women had no child and 21.6% of them had one child. The lowest pica behavior was in mothers with one child (10.7%), and the highest was in mothers with two children (24.4%). There was no significant association between numbers of children with pica. For 36.8% of the pregnant women, it was their primary pregnancy and 8.9% of them had had more than 6 pregnancies. The lowest pica was related to two pregnancies (10.4%) and the highest to three pregnancies (21.3%). There was no significant association between pregnancy ranks with pica. For gestational age, the most prevalence of pica was in pregnant women that were in the second month of their pregnancy (26.4%). There was no significant association between gestational age and pica. 20.7% of the pregnant women had positive family history of pica; of those with positive history of pica, 6.3% reported pica behavior. There was no significant association between mother's age and pica by modeling logistic regression ( $p = 0.46$ ).

## DISCUSSION

In young pregnant women, the onset of pica is frequently with their first pregnancy in late adolescence or early adulthood. Although, the pica usually remits at the end of the pregnancy, it may continue intermittently for years (Morales and Bautista, 2000). In this study, pregnant woman craved for different non-food substances such as dirt, clay, chalk, ice and freezer frost in which consumption of ice and dirt were more prevalent than others. The prevalence of pica among pregnant women in coast province, Kenya, was 56% (Smulian et al., 1995). Geophagia, the eating of dirt, usually clay, has been recorded in every region of the world both as idiosyncratic behavior of isolated individuals and as culturally prescribed behavior of particular societies (Horner et al., 1991). Pagophagia, or the excessive consumption of ice or iced drinks, is popularly regarded as a novel manifestation of pica, which emerged, predominantly in the USA (Sayetta, 1986). The prevalence of pica among pregnant women in Houston, USA, categorized by substance was as follows: Ice, 53.7%, ice and freezer frost, 14.6%, other substances such as baking powder, cornstarch, laundry starch, baby powder, clay, or dirt 8.2% (Geissler et al., 1988). Pagophagia among pregnant women in this study is as well as prevalent; 60.9% of them consumed ice and 2.3% consumed ice and freezer

frost. The prevalence of pica among pregnant women in Zaria, Nigeria, was 50%; there was a significant association between pica in family, friends or other members of the community and pica in the index pregnancy (Reid, 1992). In this study also, 20.7% of the subjects reported this behavior among their family. The prevalence of pica among Saudi pregnant women was 8.8%. The study showed no relations between the literacy level and the food habits during pregnancy in the women (Parry-Jones, 1992). In this study, although there was no significant association between the literacy level and pica, but the observed different indicate that increasing the literacy level associated with individual raises awareness, and so can be effective for decreasing pica. Modeling logistic regression ( $p = 0.46$ ) showed that in this study, there was no significant association between mother's ages and pica. This study confirmed prior reports that pica is not limited to any culture, race, sex, or socio-economic background. Pregnant women often stop having pica after delivery (Thomas, 1988; Morales and Hayes-Bautista, 2000). Pica depending on the nature, the amount of the ingested substances and how long it continues, can be linked to complications such as pre-eclampsia (toxemia), prematurity, lead poisoning, iron deficiency anemia, constipation, ulcerations, perforations and intestinal obstructions (Thomas, 1988). The high reported rate of pica in the subjects suggests that pregnant women should be educated about the potentially serious effects on the fetus and mother. There is also the need to educate about healthy nutritional practices.

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