



Neglect in the care of pregnant South African women of advanced maternal age

S J Watcham, S Schön, A L Christianson

To the Editor: Pregnant women of advanced maternal age (AMA), i.e. over 35 years old, are at increased risk of giving birth to an infant with a chromosomal abnormality.¹ Of South Africa's pregnant population 17.2% falls into the AMA category,² which accounts for the high prevalence of Down syndrome, documented to be 1.8 and 2.09 per 1 000 live births in urban and rural populations, respectively.³

Antenatal care aims to provide a normal pregnancy and delivery of a healthy infant by combating avoidable causes of antenatal and perinatal mortality and morbidity. Health professionals must therefore recognise mothers at high risk, with regard to their own and their unborn baby's wellbeing, and manage these cases appropriately.⁴

Genetic counselling and prenatal diagnosis (by amniocentesis and cytogenetic analysis) for women of AMA has been available in academic hospitals in Johannesburg since 1980.⁵ In 1990 only 5% of amniocenteses in Johannesburg were performed for black women, who comprise 90% of the pregnant population. This was considered to be due to lack of community awareness of the service and failure by the medical personnel to inform these women of the service at their first antenatal visit to confirm the pregnancy.⁶

Since 1994 this service has been free, and it has always been open to referral from the health services outside of the academic hospitals.

In 2003 and 2004 there were about 2.1 million births in South Africa, 17.2% (360 000) of which were potentially to women of AMA.^{2,7} The National Health Laboratory Service and KwaZulu-Natal Blood Bank cytogenetic laboratories performed only 1 226 amniocenteses for AMA in this period. Utilisation of public health AMA prenatal diagnosis services is therefore still poor in Johannesburg and nationwide. We investigated why AMA women attending antenatal clinics at the academic Johannesburg and Coronation hospitals were not identified in time to receive AMA counselling and the offer of prenatal diagnosis.

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Subjects and methods

An interview-based study was conducted at the two hospitals, where genetic counselling and prenatal diagnosis are available to women of AMA before 20 weeks' gestation. Pregnant women of AMA beyond 20 weeks' gestation who had neither received AMA counselling nor been offered prenatal diagnosis were identified in the antenatal clinics and asked to partake in the study. Informed consent was obtained. One researcher conducted interviews, in order to minimise interpersonal differences and interviewer bias. Issues raised by the interview were subsequently explained by the interviewer, who had genetic counselling expertise.

Biomedical information and information regarding the women's knowledge of Down syndrome, the risk to their pregnancy posed by AMA, and availability of prenatal diagnosis were obtained. Questioning then explored when and where the AMA women had their pregnancy confirmed, where they obtained antenatal care, and whether they had been informed of the risks to their baby related to their age. Their referral for further antenatal care, and the reasons for this, was documented.

Interview data were analysed and the women divided into groups according to gestational age at confirmation of pregnancy, thus enabling statistical comparison. Group 1 had confirmed their pregnancies up to 20 weeks' gestation and in time for AMA counselling and routine prenatal diagnosis; group 2 had confirmed their pregnancies after 20 weeks' gestation.

The research study was approved by the Committee for Research on Human Subjects (Medical) of the University of the Witwatersrand, and permission was obtained from the hospital medical superintendents.

Results

Seventy AMA women were interviewed, 35 at Johannesburg Hospital and 35 at Coronation Hospital. Their average maternal age was 38.9 years (SD 2.6, range 35 - 45 years), average parity 2.7 live births (SD 1.4), and average gravidity 4.1 pregnancies (SD 1.6).

Forty-eight (68.6%) women who had presented for pregnancy confirmation before 20 weeks' gestation were assigned to group 1. Group 2 comprised 22 (31.4%) women who had presented after 20 weeks. There was no significant difference between the two groups concerning average ages, parity or gravidity, or the women's knowledge of Down syndrome, prenatal diagnosis and the risks of AMA to a



pregnancy. Of the 70 women, 13 (18.6%) had their pregnancies confirmed at a public hospital, 16 (22.9%) at a primary health care clinic and 41 (58.6%) by a private primary health care medical practitioner (Fig. 1).

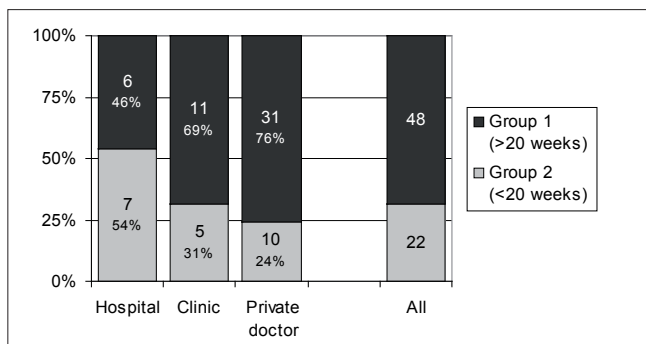


Fig. 1. Health care settings in which AMA women confirmed their pregnancy.

Of the 57 women whose pregnancies had been confirmed in primary health care (PHC), that is at clinics or by private medical practitioners, 42 (73.7%) had presented at an average of 11.5 weeks' gestation – well in time for AMA counselling and prenatal diagnosis.

Before 20 weeks' gestation, the 48 women in group 1 cumulatively visited a hospital 32 times (30.2%), clinics 23 times (21.7%) and private medical practitioners 51 times (48.1%). This amounts to 106 (average 2.2 visits per women) missed opportunities for appropriate referral for AMA counselling and prenatal diagnosis, most of which (69.8%) occurred in primary health care.

Women in groups 1 and 2 presented initially to the antenatal clinic at the academic hospitals for different reasons. Six (8.6%) referred themselves for pregnancy confirmation. The rest were referred, 18 (25.7%) for pregnancy complications, 5 (7.1%) for AMA, 4 (5.7%) for AMA and pregnancy complications, 33 (47.1%) to book for delivery and 4 (5.7%) for other medical reasons.

Eight (88.9%) of the 9 women who had AMA as a reason for presentation at an academic antenatal clinic presented before 20 weeks' gestation. One referred herself to an academic antenatal clinic before 20 weeks' gestation specifically for AMA counselling. None of these women received AMA counselling in time to be offered prenatal diagnosis.

Discussion

Few studies have focused on why pregnant women do not receive prenatal diagnosis. In an Australian study, untested women were questioned, distinguishing between those who were offered a test but chose against it and those who were not offered one. In that population, choice is the norm and only a minority (15.6%) of untested women were not offered testing.⁸ This differs vastly from the situation in Johannesburg, and in

fact throughout South Africa, where the norm appears to be the absence of choice for prenatal testing for AMA women, despite AMA counselling and the offer of prenatal diagnosis having been available for 27 years.⁵

PHC provided most of the antenatal care and confirmed most of the pregnancies of the 70 AMA women in this study, particularly the 48 women in group 1. The visit to confirm pregnancy is the first antenatal care consultation,^{4,6} but is not an end in itself. The medical or nursing practitioner has the consequent responsibility for the health care needs of the mother and her fetus, and antenatal care should not be postponed to a future visit. It has been demonstrated that antenatal care could be commenced earlier by offering it to women at the time of pregnancy confirmation, thus bringing the first antenatal visit to the patient instead of waiting for her to attend antenatal care.⁹

Primary health care practitioners also undertook considerable responsibility for ongoing antenatal care of the women in group 1; they had extensive access and opportunity to assess their AMA status and refer them appropriately. Numerous missed opportunities are cause for concern. Hospitals, including academic institutions, were also not above criticism. Advanced maternal age was the reason 8 (16.7%) women in group 1 were referred to an academic hospital, including a woman who referred herself before 20 weeks' gestation specifically for AMA counselling. None was given timely counselling. Further study is required to understand how the system fails these women.

The aims of antenatal care services with respect to AMA women are not being achieved in South Africa.⁴ National guidelines for population screening for AMA and referral for AMA counselling and prenatal diagnosis are available.^{10,11} Their implementation is hopefully anticipated.

Stephanie Schön had completed her MSc (Med) course and was writing her research report to complete her degree and become a medical genetic counsellor when she was tragically killed in a motor vehicle accident.

Arnold Christianson, a Professor of Human Genetics in the National Health Laboratory Service and Faculty of Health Sciences, University of the Witwatersrand, was her research supervisor.

After Stephanie's death Shelley Watcham, Arnold Christianson's research assistant, obtained and reviewed her results, and together they completed her research report so that Stephanie could graduate posthumously. Shelley has since gone on to study Medicine at the University of the Witwatersrand.

This paper was written to honour Stephanie Schön's memory.

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Pica and food craving in adult patients with iron deficiency in Bloemfontein, South Africa

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Pica has been defined as the craving or compulsive ingestion of non-food substances, but an enhanced craving for or intake of foodstuffs is sometimes included in this definition. Pica is associated with a number of conditions, most commonly iron deficiency, pregnancy and certain psychiatric disorders, and may occur in children. The prevalence of pica in iron-deficient adults varies widely, but may be as high as 58%,¹ whereas other studies, despite including an increased craving for food substances in their definition of pica, showed a prevalence as low as 5%.² Studies on pica and food craving in iron-deficient South African adults are scanty.³⁻⁶ The aim of this study was to describe the prevalence, types and combinations of pica and food craving in iron-deficient adults. Three types of pica and food craving not previously described are reported here, namely pica for dry macaroni, and food craving for cheese and cucumbers.

Methods

This was a descriptive study performed by a group of 3rd-year medical students between March and November 2005, as part

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of their research portfolio at three public hospitals, Universitas, Pelonomi and National, in Bloemfontein. Patients younger than 18 years, women known to be pregnant and patients with known psychiatric disease were excluded. The study was approved by the hospital management and local ethics committee. Written informed consent was obtained from each patient. After performing a pilot study to test the logistics and questionnaires, the study was initiated. Potential participants were identified via the chemical pathology laboratory, screening all the results for serum ferritin requested during a particular period. Patients found to have a ferritin level <40 ng/ml were included in the study, as this level was shown to have a high sensitivity and specificity in previous studies.^{7,8} Questions relating to the presence, type, amounts and possible alternative causes of pica and food craving were included. Questionnaires were available in English, Afrikaans and Sesotho. Pica for ice (pagophagia) and eating of dry macaroni was defined as pica and not as food craving.

Results

Twenty-nine patients were included, 23 female (79.3%) and 6 male (20.7%). Ages varied from 19 to 87 years (mean 53.8 years). Eighteen were white (62.1%), 10 black (34.5%) and 1 of mixed racial ancestry (3.4%). The ferritin level varied between 1 and 39.2 ng/ml (median 11.3 ng/ml; mean 14.9 ng/ml). Pica was identified in 16 patients (55.2%; confidence interval 35.7%; 73.6%), 15 of whom were female (93.8%). The prevalence of pica within racial groupings was 50%, 70% and 0% respectively, for white, black and mixed race patients (Fisher's exact test $p=0.3350$). The prevalence of patients with pica according to age group was as follows: 18 - 34 years – 3/5 (60%), 35 - 54 years – 10/12 (83%), 55 - 74 years – 3/7 (43%), >75 years – 0/5 (0%). These differences were statistically significant (Fisher's exact test $p=0.0102$).

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Polypica (the ingestion of more than one non-food substance in the same patient) was found in 4 patients, namely the combination of dust and clay in 1 patient, ice, clay and chalk in 1, soil and chalk in 1, and soil and ashes in 1. In another 4 patients a combination of pica and food craving was found: ice and cheese in 1 patient, ice and tomatoes (tomatophagia) in 1, ice, matches (cautopyreiophagia) and brown bread (amylophagia) in 1, and ice and cucumber in 1. The other 8 patients all had a single form of pica only, namely pagophagia (4 patients), geophagia (soil-eating in 2 and clay-eating in 1) and dry macaroni (1). When the patients who had more than one form of craving were included, pagophagia was found in 9 patients (56.2%) and geophagia in 7 patients (43.8%). An inverse relationship was noted between age and polypica, as well as an inverse relationship between polypica and ferritin levels (Fig. 1). Of note is that food cravings were never seen in the absence of pica.

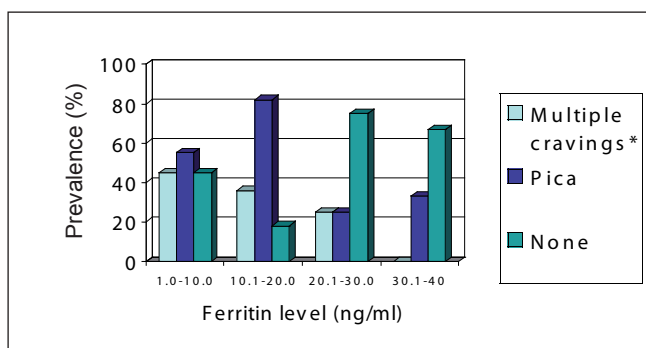


Fig. 1. Prevalence of pica according to ferritin levels (*multiple cravings is defined as polypica, the combination of pica and food craving or multiple food cravings).

Seven of the 9 white patients with pica had pagophagia (77.8%), compared with two out of the 7 black patients with pica (28.6%) (Fisher's exact test $p=0.1262$). In contrast, geophagia was seen in 5 of the 7 black patients with pica (71.4%) compared with only 2 out of the 9 white pica patients (22.2%) (Fisher's exact test $p=0.1262$).

Discussion

Many different types of pica have been described, including craving for ice, soil, dirt or clay, heads of burnt matches (cautopyreiophagia), cigarettes and cigarette ashes, paper, starch (amylophagia), crayons, cardboard, faeces (coprophagia), stones (lithophagia), mothballs, hair (trichophagia), egg shells, foam rubber, aspirin, coins, vinyl gloves, popcorn (arabosiphagia), baking powder and others. It is often thought to be harmless, but a range of complications have been described. These include abdominal problems (sometimes necessitating surgery), hypokalaemia, hyperkalaemia, dental injury, naphthalene poisoning (in pica for toilet air-freshener blocks), phosphorus poisoning (in pica for burnt matches),

peritoneal mesothelioma (geophagia of asbestos-rich soil), mercury poisoning (in paper pica), lead poisoning (in dried paint pica and geophagia), and a pre-eclampsia-like syndrome (baking powder pica).

Studies have shown that the prevalence of pica is highest in iron-deficient populations, and that the presence of pagophagia is a particularly strong indicator of iron deficiency anemia. Iron deficiency may not be the only cause of pica, as pica has also been associated with pregnancy, zinc deficiency, lead poisoning, schizophrenia, autism, gastric bypass surgery for obesity, sickle cell disease and dialysis.

Previous surveys among medical specialists have shown that they think pica is rare, with the result that it is often under-diagnosed, and not sought for in a systemic way by the majority of practitioners.⁹ Despite the small patient numbers and a relatively high cut-off point for ferritin, our study confirmed a high prevalence of pica in the tested population. As seen in previous studies, pica was found to be more common in females than in males.¹⁰ The prevalence of pica was higher in black patients than in other ethnic groups, and it was virtually absent in patients over the age of 65, despite mean ferritin levels similar to those in other age groups.

Pagophagia and geophagia have been reported to be the most common forms of pica, often depending on the subject's geographical origin. Some studies have found a prevalence of pagophagia in patients with pica as high as 88%.¹ In keeping with this, pagophagia was found to be the most common form of pica in this study. It was noteworthy that pagophagia was found in combination with another form of pica or food craving in 5 of the 9 cases. In 1 patient the pagophagia was so severe that the patient's teeth were damaged to the extent that all of them had to be removed. Some patients reported eating the frost they had scraped from the freezer. An interesting observation is the fact that pagophagia was the predominant form of pica in white patients in this study, whereas geophagia was predominant in blacks. This concurs with a study from Botswana in which it was found that all the black patients in their study had geophagia, with none having pagophagia.¹¹ The influence of cultural factors was illustrated by the fact that some black patients in our study reported that clay or soil was sold in local shops as a treatment for tiredness.

Combinations of pica or combinations of pica and food craving have not been commonly described, and food craving has been described in the absence of pica in many patients.² In this study, polypica or the combination of pica and food craving was common and seen in half the patients with pica, yet no patient had food craving in the absence of pica. Previous studies have shown that pica often decreases significantly with the onset of iron therapy and returns when iron therapy is discontinued.² As this study did not include formal follow-up, incomplete data exist regarding response to iron therapy, but we are aware that 4 of the 16 patients with pica noted a



decrease or complete disappearance of their pica symptoms with the onset of iron therapy. The single male patient with pica reported that it disappeared soon after he started dialysis.

Weaknesses of the study include the fact that lead, zinc and haemoglobin levels were not systematically determined and that the presence of anaemia could not be correlated with the presence of pica. Also, although patients with known psychiatric disease and pregnancy were excluded, no formal psychiatric evaluation or pregnancy testing was done. Other factors that may have influenced the results include cultural differences, geographical origin and language difficulties.

Conclusion

Pica is common and remains an important clue to underlying iron deficiency. The ingestion of toxic substances may have serious consequences. It needs to be recognised, and an underlying cause sought and treated. Pagophagia and geophagia are particularly good indicators for iron deficiency, yet often go unrecognised. Further studies are needed to delineate the exact pathophysiological mechanisms of this fascinating condition.

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