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Original Research Article

Kaolin consumption and outcome of surgery in women: a comparative study of 263 operations at the Yaoundé Gyneco-Obstetric and Pediatric Hospital

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ABSTRACT

Background: Kaolin consumption is common in our sub-Saharan Africa. The objective of this study was to assess the effects of kaolin consumption on the outcome of surgery in women.

Methods: It was a cohort study comparing the occurrence of complications during labor among 263 consecutively recruited women who underwent gynecologic or obstetric surgery at the Yaoundé Gyneco-Obstetric and Pediatric Hospital, Cameroon. Sixty of them (22.8%) declared kaolin consumption before surgery and 203 (77.2%) who denied having consumed kaolin before surgery.

Results: Kaolin consumption was found to predispose to postsurgical infections (RR=3.03; IC=1.82-5.05).

Conclusions: Kaolin geophagia should be identified before surgery to prevent related postsurgical infections. A systematic ban of kaolin consumption is also recommended.

Keywords: Cameroon, Kaolin, Outcome, Postsurgical infections, Surgery

INTRODUCTION

Kaolin geophagia is a worldwide practice, particularly in Africa and South-America.^{1,2} In sub-Saharan Africa, rates as high as 50% to 84% of pregnant women consuming kaolin have been documented.^{1,2} Cultural reasons and gastric disorders are the main explanations of the higher frequencies of this abnormal nutritional behavior in pregnant women.^{2,4}

To date, little is known about the surgical complications commonly occurring in kaolin-consuming women, especially in sub-Saharan Africa. The objective of this study therefore was to assess the effects of kaolin consumption on the outcome of gynecologic and obstetric surgeries.

METHODS

This was a cohort study comparing the occurrence of surgical complications between 60 women who declared habitual kaolin consumption (exposed group) to 203 women who denied kaolin consumption (non exposed group). Both groups were consecutively recruited, from December 15th 2014 to April 30th 2015, at the Yaoundé Gynaeco-Obstetric and Pediatric Hospital, Cameroon. After the approval of the protocol by the ethical committee of the hospital, all women admitted for elective or emergency surgery and who gave their informed consent, were recruited into the study. Occasional kaolin consumers and women who underwent minor surgeries such as intrauterine curettage or intrauterine aspiration, marsupialization and cervical

cerclage were excluded. The enrolled women were examined on admission and followed by an obstetrician/gynecologist or a resident in obstetrics and gynecology. A pretested questionnaire was administered and the women were followed up from inclusion into the study to the post-operative visit. The variables studied were: socio-demographic characteristics (age, parity, profession, marital status, level of education), characteristics of kaolin consumption (duration, quantity, frequency, reason), personal and family history, characteristics of the surgery (type, indication) hemoglobin level, postsurgical complications (infection, hemorrhage, bowel occlusion, deep venous thrombosis).

For the calculation of the minimal sample size for each group, it was assumed that kaolin consumption would multiply by three the rate of postsurgical infections from 23,2% reported by HENTCHOYA et al. at the Yaoundé University Teaching Hospital.⁵ The calculated minimal sample size using the formula proposed by SCHULZ et al was 43 subjects for each group with chosen precision and power respectively of 5% and 90%.⁶ Statistical analysis was done using Epi info 3.5.4 and SPSS 12.0 software. The difference was statistically significant for P-value<0.05. The Pearson's Chi square and the Fisher's exact test were used to compare proportions. The difference was statistically significant for P-value<0.05. Relative risk (RR) was calculated to measure the association between kaolin consumption and the outcome of gynecologic and obstetric surgery.

RESULTS

Two hundred and sixty-three women who met the inclusion criteria during the recruitment period were included in the study. Among them, 60 (60/263; 22.8%) declared non-occasional kaolin consumption before surgery (exposed group) while 203 (203/263; 77.2%) did not consume kaolin (non-exposed group).

Table 1: Significant pre-inclusion variables between the exposed (N=60) and the non-exposed (N=203) groups.

Variable	Kaolin consumption n (%)	No kaolin consumption n (%)	P
(35-40) years age group	5 (8.3)	46 (22.7)	0.0081
Single	33 (55.0)	82 (40.4)	0.0321
Married	26 (43.3)	119 (58.6)	0.0261
Gravidity 0	6 (10.0)	6 (2.9)	0.0326
Gravidity 5	2 (3.3)	25 (12.1)	0.0297

The analysis of the pre-inclusion variables (Table 1) showed that single women and nulligravidae were significantly involved in kaolin consumption, while women aged between 35 and 40 years, married or who had five previous pregnancies were significantly

represented in the non-exposed group. Other pre-inclusion variables, such as the presence of anemia pre-operatively (P=0.0622), showed no significant association with kaolin consumption.

In the exposed group, the mean duration of kaolin consumption before surgery was 52.2±64.9 months, with a duration lasting more than a year in 53.3% of the women included (Table 2). Kaolin consumption was at least weekly in 86.6% of patients. At the same time, 41.7% of them ingested more than 100g of kaolin per week. Desire (73.3%) and nausea or vomiting (31.7%) were the main reasons given to justify kaolin geophagia in this study.

Table 2: Characteristics of kaolin consumption in the exposed group (N=60).

Characteristic	n (%)
Duration of consumption	
< 3 months	13 (21.7)
(3-12) months	15 (25.0)
≥ 12 months	32 (53.3)
Frequency of consumption	
Daily	23 (38.3)
Weekly	29 (48.3)
Monthly	8 (13.4)
Quantity consumed	
<100 g/week	35 (58.3)
≥100 g/week	25 (41.7)
Reason for consumption	
Desire	44 (73.3)
Nausea or vomiting	19 (31.7)
Gastric pain	1 (1.7)
Attractive odor	1 (1.7)
No reason	3 (5.0)

Table 3: Comparison of the types of surgeries between the exposed (N=60) and the non-exposed (N=203) groups.

Type of surgery	Kaolin consumption n (%)	No kaolin consumption n (%)	P value
Cesarean section	38 (63.3)	151 (74,4)	0.1311
Laparoscopy	1 (1.7)	4 (2.0)	0.8799
Laparotomy for ectopic pregnancy	4 (6.7)	20 (9.9)	0.4592
Ovarian cystectomy	4 (6.7)	3 (1.5)	0.0444
Myomectomy	6 (10.0)	11 (5.4)	0.2072
Hysterectomy	5 (8.3)	9 (4.4)	0.2409
Mastectomy	2 (3.3)	5 (2.4)	0.9657

The most common type of surgery in the study population was cesarean section constituting 71.7% of the operations. Apart from a slight statistical difference

between the two groups as far as ovarian cystectomies were concerned, there was no other significant difference in terms of the types of surgeries done in our patients (Table 3). Women who consumed kaolin during their pregnancy had a higher risk (Table 4) of postsurgical

infections (RR=3.03; IC=1.82-5.02). These infections included parietal suppurations, endometritis and pulmonary infections. The other post-operative variables studied were not significantly associated with kaolin consumption.

Table 4: Comparison of the post-operative complications between the exposed (N=60) and the non-exposed (N=203) groups.

Post-operative complications	Kaolin consumption n (%)	No kaolin consumption n (%)	RR (95% CI*)	P
Anemia	4(18.2)	18(81.8)	0.78 (0.31-1.96)	0.4068
Infections	7(63.6)	4(36.4)	3.03 (1.82-5.02)	0.0036
Bowel occlusion	1(33.3)	2(66.7)	1.47 (0.29-7.39)	0.5417
Deep venous thrombosis	0(0)	1(100)	1.11 (0.04-27.01)	0.7718

*CI = Confidence Interval

DISCUSSION

According to our findings, 22.8% of the enrolled women consumed kaolin at least once monthly before surgery. This figure is below the 50% to 84% prevalence of kaolin consumption reported respectively in Nigeria and Uganda in pregnant women.²

We propose an explanation for this rate in the fact that we included non-pregnant women undergoing gynecologic surgery and excluded occasional kaolin consumers in the study. As a matter of fact, the strong desire for kaolin ingestion by pregnant women is known, and explained mostly by cultural reasons and gastric discomfort relief (7-8). However, rates reported in South-America are similar to ours.⁹

Kaolin consumption during pregnancy was found in this study to predispose to postsurgical infections. To the best of our knowledge, this has never been documented in the available literature. An explanation for this predisposition to postsurgical infections could be found in the iron deficiency anemia documented in kaolin consumers, possibly due to induced hypoxia that may result in tissue ischemia and local immune impairment.¹⁰

The postsurgical infections identified in this study as a result of kaolin consumption are mainly explained by iron deficiency anemia; however this was not specifically objectified in our findings. This might have given some bias to our results.

CONCLUSION

Kaolin consumption predisposes to post-surgical infections after gynecologic or obstetric surgeries. Kaolin geophagia should be identified before surgery to prevent related postsurgical infections. A systematic ban of kaolin consumption is also recommended.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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