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Factors associated with uptake of subdermal contraceptive implants in a young Kenyan population☆

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Abstract

Background: Subdermal contraceptive implants may be a reasonable option for young women in sub-Saharan Africa; little is known about factors associated with method uptake in this subpopulation.
Study Design: Four hundred women aged 18–24 years who sought short-acting hormonal contraception were offered an opportunity to use an implant instead. Cross-tabulations and logistic regression analysis were used to examine participant characteristics and other factors associated with choosing an implant.
Results: Twenty-four percent of participants chose the implant. Participants with greater than 4 years of contraceptive need were over three times more likely to choose an implant [odds ratio (OR), 3.4; 95% confidence interval (CI), 1.6–6.9]. Women with health concerns over short-acting hormonal methods (OR, 2.2; 95% CI, 1.3–3.6) and those who expressed some difficulty returning to a clinic (OR, 1.9; 95% CI, 1.1–3.1) were about twice as likely to choose an implant. Product attributes such as long-acting protection and convenience were cited reasons for choosing an implant.
Conclusions: The implant appears to be an attractive option for a fairly large proportion of young women in Kenya. Within this age group of implant users, homogeneity of demographic characteristics relative to short-acting users suggests that the product has broad appeal.
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Keywords: Subdermal contraceptive implants; Acceptability; Sub-Saharan Africa; Young women; Contraceptive decisions

1. Introduction

Contraceptive subdermal implants are becoming more available in many regions of the world, including sub-Saharan Africa. Donor agencies procured 406,200 units for the region in 2007 and 801,793 and 1,551,305 units in 2008 and 2009, respectively [1]. In past decades, chronic shortages of commodities and lack of trained health personnel have limited access to implants, despite well-documented positive experiences with the technology dating back to introductory trials in the 1980s [2,3]. With new levels of commodities reaching sub-Saharan Africa, Ministries of Health and other agencies are training health care workers to provide information on implants and offer the method.

This new development is long overdue because of today's untenable reliance on short-acting reversible methods. Short-acting hormonal methods (led by injectables) constitute 70% of the modern method mix in sub-Saharan Africa, whereas long-acting reversible methods (intrauterine devices and implants) constitute less than 4% [4]. Unmet need for contraception is likely to increase as population growth outpaces availability of contraceptive commodities. In addition, unmet need will rise as younger women enter their fertile years with changing ideas about childbearing and smaller family size; new research shows downward trends in ideal family size in sub-Saharan Africa [5]. Currently, unmet need for spacing pregnancies exceeds that of limiting births in sub-Saharan Africa [6]; approximately one third of women interviewed in Demographic and Health Surveys in

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sub-Saharan Africa in the last 5 years want to wait at least 2 years before having another child [7]. Simply attempting to service all needs with short-acting methods that have stubbornly high discontinuation rates (resulting in unintended pregnancy) is not a viable public health strategy. If 20% of women using short-acting hormonal methods in sub-Saharan Africa voluntarily switched to an implant for their longer-term needs, approximately 1.8 million unintended pregnancies could be averted in a 5-year period [8].

As implants become more available, it is important to ensure all women, including younger family planning users, are offered a choice. Younger women report the highest rates of unintended pregnancy and the vast majority of total unintended pregnancies in sub-Saharan Africa. Thus, younger women need better access to the most effective forms of reversible contraception.

Uptake of implants in a young African population has not been studied; better information will help gauge level of demand for this essential family planning option in a population at highest risk of unintended pregnancy. Among young women, what attributes of different methods are important? What personal situations make implants the method of choice? How does dissatisfaction with injectables or oral contraceptives and/or attraction to implants drive choice? Answers to these and other questions will aid in projecting the future potential for this contraceptive in sub-Saharan Africa.

2. Materials and methods

We conducted this study at Lang'ata Health Centre in Nairobi, Kenya. Recruitment began in November 2008 and was completed in June 2009. The analysis in this report uses enrollment data only; when the prospective portion of the study is complete, results on end points such as contraceptive discontinuation and unintended pregnancy will be shared. The protocol for this study was reviewed and approved by US and Kenyan ethical review boards.

Women who sought family planning services and agreed to be interviewed were screened for eligibility. We applied four key inclusion criteria: 18–24 years old, desire for depot medroxyprogesterone acetate (DMPA) or combined oral contraceptives (COC), possession of a working cell phone and willingness to be contacted via cell phone. We excluded women who reported a pregnancy in the last 6 months (to avoid possible sub-fecund intervals) or had an a priori desire for a subdermal implant. After screening, the study nurse explained the purpose of the study through the informed consent process; 400 women enrolled voluntarily.

The study nurse explained that participants could choose the method they originally sought or opt for a subdermal implant (a two-rod levonorgestrel product, which is the product donated by the funding agency). The methods were provided free of charge; in usual circumstances, women receiving services at the facility pay a one-time fee of about $0.20 to establish a family planning record. The nurse and participants discussed the advantages and disadvantages of the different choices. No script or written comparisons were used. The most common topics included side effects, efficacy and differences in how to start, continue and discontinue each family planning option. For participants who decided to try an implant, the nurse reviewed six key items (in the form of a checklist) and required a participant signature before starting the insertion procedure (Fig. 1). The signed card was kept as a study document. The nurse gave the participant a duplicate card and filled out items on the opposite side (date of insertion, name of product, maximum effectiveness date etc.). At the time of enrollment, participants answered questions about their contraceptive and reproductive health history, demographic characteristics and factors that might influence decisions to choose and stop using a contraceptive. Any misinformation on the methods was clarified before providing a contraceptive. After

Information for the study nurse:
Before inserting the implant, make sure you have discussed these points with the client and she understands them thoroughly.

Please explain the following points to the prospective implant client before insertion.

- ☐ We offer a variety of contraceptive methods and you can choose the one you want.
- ☐ It will hurt a bit to get the implant inserted and probably a bit more to get it removed.
- ☐ The implant will change your menstrual pattern. It may cause unpredictable intermenstrual spotting and possibly prevent menstrual bleeding from occurring.
- ☐ The insertion/removal procedures may bruise your arm and leave a small visible scar.
- ☐ The implant lasts for 5 years: you (the client) need to remember this and return for removal when the time comes.
- ☐ You can have the implant removed at any time and for any reason; this procedure is done here.

To the participant:
This card will be put in your file. Please sign on the space provided if:

1. The study nurse discussed the above points with you,
2. And, you have no further questions,
3. And, you still want to receive the contraceptive implant.

Fig. 1. Checklist for women selecting an implant.

choosing a method, we asked participants why they chose that method.

We used logistic regression to examine factors associated with choosing an implant. Our primary independent variable was desired length of use of the chosen contraceptive. We created three categories for this variable: 2 years or less, 25 to 48 months or more than 4 years of anticipated need (women who did not want more children were included in the latter group). We also used χ^2 tests of association for bivariable analysis. We considered all relevant demographic and exploratory variables in the initial logistic regression model (see Table 1 for list of variables used). In the modeling process, we assessed possible confounding by removing other explanatory variables and monitoring changes in the odds ratio of the primary independent variable [9]. We retained variables whose inclusion or exclusion had an

Table 1
Percent distribution of participant characteristics by type of method chosen and odds of choosing the implant given different characteristics

Characteristic	DMPA/COC, *n*=299 (%)	Implant, *n*=97 (%)	Univariable odds ratio (95% CI)	Adjusted odds ratio (95% CI)[a]
Age (years)				
18–19 (reference)	11.4	11.3	–	–
20–22	39.8	46.4	1.2 (0.5–2.5)	1.1 (0.5–2.6)
23–24	48.8	42.3	0.9 (0.4–1.9)	0.7 (0.3–1.6)
Education*				
Less than primary (reference)	20.7	20.6	–	–
Completed primary	60.2	47.4	0.8 (0.4–1.4)	0.7 (0.4–1.3)
Some secondary or higher	19.1	32.0	1.7 (0.9–3.3)	1.6 (0.7–3.6)
Number of children				
0–1 (reference)	60.5	57.7	–	–
2+	39.5	42.3	1.1 (0.7–1.8)	1.3 (0.7–2.5)
Has employment income				
No (reference)	67.6	66.0	–	–
Yes	32.4	34.0	1.1 (0.7–1.7)	1.2 (0.7–2.1)
Marital status				
Single (reference)	14.0	16.5	–	–
Married	86.0	83.5	0.8 (0.4–1.6)	0.8 (0.4–1.6)
Length of time in current relationship (years)				
<1 (reference)	16.0	20.6	–	
1–3	46.5	37.1	0.6 (0.3–1.2)	
3+	37.5	42.3	0.9 (0.5–1.7)	
Wants another child				
No (reference)	7.7	11.3	–	
Yes	92.3	88.7	0.7 (0.3–1.4)	
Ideal timing of next pregnancy*				
Within 2 years or unsure (reference)	30.4	13.4	–	–
25–48 months	22.7	21.6	2.2 (1.0 –4.6)	2.6 (1.1–5.8)
>4 years or never	46.8	65.0	3.2 (1.6–6.1)	3.4 (1.6–6.9)
Previous unintended pregnancy				
No (reference)	42.8	35.0	–	
Yes	57.2	65.0	1.4 (0.9–2.2)	
Previous use of a modern method				
No (reference)	4.7	6.2	–	
Yes	95.3	93.8	0.7 (0.3–2.0)	
Attitudes toward menstrual changes induced by contraception				
Might stop using/unsure (reference)	19.4	19.6	–	
Would continue using	80.6	80.4	1.0 (0.6–1.8)	
Does body need occasional break from DMPA or COCs?*				
No (reference)	50.8	29.9	–	–
Yes	49.2	70.1	2.4 (1.5–4.0)	2.2 (1.3–3.6)
Ease of returning to clinic for resupply method*				
Very easy (reference)	52.5	35.0	–	–
Not so easy	47.5	65.0	2.0 (1.3–3.3)	1.9 (1.1–3.1)
Does long-term use of DMPA/COC impair future fertility?				
No (reference)	65.2	58.8	–	
Yes	34.8	41.2	1.3 (0.8–2.1)	
Total	100.0	100.0	–	–

CI, confidence interval.

[a] Results from final logistic regression model; not all variables included due to elimination in the modeling process (see "Materials and methods").

* p value <.05, χ^2 test.

important impact on the parameter estimates of the primary independent variable. In addition, we included many standard sociodemographic variables in the final model. In summary, we aimed to find a minimal set of factors associated with choosing an implant and simultaneously tried to generate valid estimates on the strength of any associations.

3. Results

We approached 774 consecutive family planning clients, and 347 (45%) were ineligible to participate, mainly for recent postpartum status, age and lack of a cell phone. Of the remaining 427 clients, a total of 400 women chose to participate and 27 (6.3%) did not want to participate. In addition, four participants who enrolled were later found to be ineligible. After contraceptive counseling and informed choice, 97 (24%) of the 396 eligible participants chose the implant (Table 1). The DMPA/COC users were remarkably similar to the implant users when comparing standard demographic characteristics. Only education levels were statistically different; 32% of implant users and 19% of DMPA/COC users were in the highest education category. Similar proportions of women in the two contraceptive groups wanted another child, but the ideal timing of the next pregnancy differed. Sixty-five percent of implant users wanted at least 4 years of pregnancy protection, compared with 47% of DMPA/COC users ($p<.05$). Participants who identified potential barriers to continued use of DMPA/COC were more likely to choose the implant. For example, 70% of implant users felt that the body needs an occasional break from DMPA/COC; this sentiment was shared by only 49% of DMPA/COC users ($p<.05$). Finally, 65% of implant users stated some difficulty in returning to the clinic for resupply of contraceptives, compared with 47% of DMPA/COC users ($p<.05$).

In the multivariable logistic regression, many of the associations noted in the cross-tabulations from above remained important predictors in the decision to try an implant. Women with medium-length contraceptive needs (25–48 months) were over twice as likely as women with shorter needs to choose an implant; those with more than 4 years of need were three times more likely. Participants with the following opinions/situations were approximately twice as likely as their reference groups to choose an implant: body needs a break from DMPA/COC, some difficulty to return for contraceptive resupply. Confounding was minimal in the study population; however, we retained some standard demographic characteristics in the final model for completeness. This decision did not affect the point estimate or confidence interval around the primary odds ratio.

Women choosing the implant cited product attributes such as convenience (33%) and long duration (67%) as reasons for use (Table 2). DMPA/COC users did not point to specific product attributes as readily as implant users, and consequently, the largest category of response was nonspecific reasons (50%). Ease of use was cited by 20% of DMPA/COC users compared with only 5% of implant users. Misinformation on DMPA/COC cited in the logistic regression results (body needs a break, fertility impairment) were not cited reasons for choosing an implant.

Table 2
Percentage of women citing specific reasons for choosing method

Reason why method was chosen	DMPA/COC (n=299)	Implant (n=97)
Convenient to use	4%	33%
Long-acting	1%	67%
Reversible	0%	9%
Highly effective	1%	9%
No side effects/safe	19%	14%
No specific reason	50%	7%
Short-acting	7%	0%
Spouse approval	6%	0%
Easy to use	20%	5%

Percentages do not sum to 100% because multiple reasons were allowed. Miscellaneous responses constituting six or fewer total citations are not shown.

4. Discussion

In this study, 24% of young Kenyan women voluntarily chose an implant, even though they came to the clinic with a priori notions of using a short-acting hormonal method. Implant attributes and some health concerns about DMPA were important predictors of choosing an implant. Implant users cited more specific product features to explain their preference, compared with DMPA/COC users.

Our study among a young population showed high interest in trying an implant. Within this group, characteristics such as number of children, desire for more children and previous use of a modern method were not associated with choosing an implant. This finding suggests that the product has broad appeal within subgroups. Nearly 60% of participants reported a previous unintended pregnancy (57% for DMPA/COC and 65% for implant users). Though this factor is suggestive of choosing an implant for better pregnancy protection, it did not reach statistical significance in our analysis ($p>.05$). However, women needing longer protection from future pregnancy were more likely to select an implant. This association was incremental. Only 13% of women with up to 2 years of need selected an implant; with increased length of need, this percentage rose to 24% (25–48 months of need), and 31% (49+ months of need; data not shown). Ten percent of the study population could not put a time frame on the ideal timing of a future pregnancy, and 15% of this subgroup chose the implant (data not shown).

When long-acting contraceptives, trained personnel and time to provide these methods are in short supply, providers may overlook younger women and low-parity women as possible candidates for use of implants. Providers may rationalize bias in this way: one implant given to the right candidate (older, high parity, never wanting another pregnancy) will probably be used for the full 5 years, whereas a woman

with a different profile might use the product only half that time. Consequently, younger and lower parity women (the most fecund and most likely to experience profound life changes from unintended pregnancy) are often left with the methods that are more difficult to use and less effective. In Ghana, for example, minimum client age has been a documented factor in provider bias [10].

Missed opportunities to provide a better match between fertility intentions and the most effective methods are common at public sector facilities where DMPA dominates. DMPA provides highly efficacious protection from pregnancy for up to 4 months. However, after that, the following factors can overwhelm the best of intentions to continue use: onset of side effects, sporadic periods of abstinence, inconsistent availability of public sector supplies and services, inconvenience to get a reinjection, possible embarrassment of being seen in the family planning queue every 3 months, cultural pressures to have more children, fluctuating ambivalence toward pregnancy etc. In contrast, implants provide single-visit protection from unintended pregnancy until removal is sought. Thus, even for young women with contraceptive needs of about 2 years, the implant may be a reasonable option. Wider availability of a lower-cost product [11,12] may ease supply-side limitations and expand uptake in nontraditional populations.

This study was conducted at one public sector health facility in Kenya and among only 400 young women. The major limitation of this effort is extrapolation to other populations of same-aged women. In addition, this report addresses method uptake only. Acceptability/satisfaction and health benefits relative to short-acting hormonal methods will be assessed in the prospective portion of the study. Method discontinuation, unintended pregnancy and incidence of serious adverse events will be compared among users of these contraceptive methods. This information along with estimates on costs of implant services relative to short-acting methods can be used to examine economic aspects of choice.

In Kenya, only about 60% of women adopting short-acting hormonal contraception are given information on other family planning options [13]; however, 82% of implant users are informed of other options. This seemingly tiered approach to sharing information on all choices could simply reflect clinic/provider's inability to offer many choices. However, the difference might also reflect provider bias toward simply giving clients information on the easiest methods to provide. Family planning providers in Kenya and other countries may not know that a substantial proportion of young women might be interested in trying an implant. Though trying an implant and satisfaction with the product are two different concepts, the former is a necessary step if the potential impact and costs/benefits (including costs when amortized over typical length of use) can be compared to short-acting methods. Increasing access to the most effective forms of contraception is a reproductive health imperative; more voluntary uptake of such methods will improve the health status of women in Kenya and elsewhere in the region.

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