

Availability and Use of Contraceptive Implants in Jamaica: Results of a Review of Medical Records and a Survey of Reproductive Healthcare Providers in Six Public Health Centres

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ABSTRACT

Objective: The prevalence of sub-dermal contraceptive implant use in Jamaica is low, despite growing international acceptance of long-acting reversible contraception. This study assessed the availability, effectiveness, side-effects and utilization of sub-dermal contraceptive implants and described the characteristics of users over a one-year period.

Methods: We reviewed the medical records of women aged 15–45 years who utilized contraceptive implant-related services at any of the six included public health centres in Jamaica during 2013, and surveyed 20 available reproductive healthcare providers.

Results: In 2013, 738 women attended a Jamaican public health centre for contraceptive implant services: 493 (66.8%) for insertion, 202 (27.4%) for removal and 53 (7.2%) for follow-up visits (10 women had the same implant inserted and removed in 2013). The women's median age was 26.0 years, 24.3% were ≤ 18 years, and 85.9% had ≥ 1 child. Most women (68.5%) did not have documented side-effects; irregular bleeding, the most commonly documented side-effect, was recorded for 24%. Of the 493 women who had implants inserted, three (0.6%) were identified to be pregnant within three months of insertion. Among the 202 women who had implants removed, 11 (5.4%) experienced complications with removal. Reproductive healthcare providers highlighted the need for an expansion of contraceptive implant availability and provider training.

Conclusion: Sub-dermal implants have few insertion complications and side-effects and are effective, but were underutilized in Jamaica. Increased implant availability and enhanced reproductive healthcare provider training may improve implant utilization and reduce unintended pregnancy rates in Jamaica.

Keywords: Contraception, contraceptive implant, Jadelle, Jamaica, long-acting reversible contraception, Sino-Implant (II)

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Disponibilidad y uso de los implantes anticonceptivos en Jamaica: resultados de una revisión de las historias clínicas y una encuesta de los proveedores de salud reproductiva en seis centros de salud pública

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RESUMEN

Objetivo: La prevalencia del uso de implantes anticonceptivos subdérmicos en Jamaica es baja, a pesar de la creciente aceptación internacional de la anticoncepción reversible de acción prolongada. El presente estudio evalúa la disponibilidad, efectividad, efectos secundarios y utilización de los implantes anticonceptivos subdérmicos, y describe las características de los usuarios durante el período de un año.

Métodos: Se revisaron las historias clínicas de mujeres de 15 a 45 años de edad, que utilizaron servicios relacionados con los implantes anticonceptivos en cualquiera de los seis centros de salud pública de Jamaica durante 2013, y se encuestaron 20 profesionales de salud reproductiva disponibles.

Resultados: En 2013, 738 mujeres asistieron a un centro de salud pública de Jamaica para recibir servicios de implantes anticonceptivos: 493 (66.8%) para inserción, 202 (27.4%) para eliminación, y 53 (7.2%) para visitas de seguimiento (a 10 mujeres se les insertó y se les quitó el mismo implante en 2013). La edad promedio de las mujeres fue 26.0 años, 24.3% tenían ≤ 18 años, y el 85.9% tenían ≥ 1 niño. La mayoría de las mujeres (68.5%) no presentaban efectos secundarios documentados. El sangramiento irregular – el efecto secundario más comúnmente documentado – se registró en un 24%. De las 493 mujeres que tenían implantes insertados, se halló que tres (0.6%) resultaron embarazadas en el plazo de tres meses tras la inserción. De las 202 mujeres a las que se les había retirado el implante, 11 (5.4%) tuvieron complicaciones en el proceso de la eliminación. Los profesionales de la salud reproductiva destacaron la necesidad de expandir la disponibilidad de implantes anticonceptivos y la capacitación de proveedores.

Conclusión: Los implantes subdérmicos presentan pocas complicaciones a la hora de su inserción, y tienen pocos efectos secundarios. Sin embargo, son subutilizados en Jamaica, a pesar de ser efectivos. Una mayor disponibilidad de implantes y una mejor capacitación de los profesionales de la salud reproductiva pueden mejorar la utilización de implantes y reducir las tasas de embarazos no intencionados en Jamaica.

Palabras clave: Anticoncepción, implante anticonceptivo, Jadelle, Jamaica, anticoncepción reversible de acción prolongada, Sino-implante (II)

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INTRODUCTION

Nearly 50% of the pregnancies in Jamaica are unintended (1). Unintended pregnancies are associated with inadequate prenatal care, serious maternal and infant sequelae, and poorer outcomes for the mother-child relationship (2). Studies in the United States of America (USA) indicate that unintended pregnancies are mainly due to lack of access to contraceptive methods or their inconsistent or incorrect use (3).

Long-acting reversible contraception (LARC), which includes levonorgestrel-releasing and copper intrauterine devices (IUD) and sub-dermal implants, is the most effective reversible method for preventing pregnancy because it does not require ongoing patient compliance (4). With a typical-use failure rate of 0.05%, contraceptive implants are 20 times more effective in preventing unintended pregnancies than the contraceptive pill, patch or ring (5). They are also safe for adolescents and for

women with co-morbid health conditions, such as HIV infection or cardiovascular risk factors (6, 7). However, despite these benefits, sub-dermal implants are among the most underutilized contraceptive methods in many resource-limited settings (8).

Barriers to LARC use are multifactorial. Patients and reproductive healthcare providers often have misconceptions of LARC safety and effectiveness, particularly with use in different populations of women (9). In resource-limited settings, the cost of LARC limits accessibility and reproductive healthcare providers' familiarity with insertion techniques (8, 9). In Jamaica, cost barriers at the national level have led to unreliable availability of contraceptive implants and, subsequently, low utilization. In 2013, 50% of facilities carrying contraceptive implants reported having been out of stock for at least six months, and as of the end of 2013, national warehouse stores of contraceptive implants were depleted (10).

To understand utilization patterns better, as well as the safety and effectiveness of contraceptive implants in Jamaica, we reviewed medical records and abstracted data on contraceptive implant visits from January 1 to December 31, 2013. The aims of this study were to assess utilization and discontinuation of sub-dermal contraceptive implants in Jamaica, describe the population of women accessing contraceptive implants, identify side-effects and complications of different contraceptive implants, and survey reproductive healthcare providers on contraceptive implant availability and training.

SUBJECTS AND METHODS

The National Family Planning Board (NFPB) of the Ministry of Health, Jamaica, in collaboration with the Division of Reproductive Health of the Centers for Disease Control and Prevention (CDC), USA, conducted medical record reviews and data abstraction from health centre visits for contraceptive implant-related services from January 1 to December 31, 2013, within the Jamaican public health sector. The sole inclusion criterion for the medical record review was that the health centre had at least one reproductive healthcare provider who performed contraceptive implant insertions in 2013.

There were a total of 313 public sector clinics and health centres in Jamaica that provided reproductive health services. Of this group, four health centres and two non-governmental sexual health clinics met the inclusion criterion. These health centres represented three of the four administrative health regions in Jamaica: South East, Southern and North East. There were no public

health centres in the Western health region ($n = 80$) that provided implant services during 2013.

In 2013, two types of contraceptive implants were available for insertion in Jamaica: Jadelle and Sino-Implant (II). Both Jadelle and Sino-Implant (II) consist of two rods with 75 mg levonorgestrel per rod. Jadelle was the primary contraceptive implant actively imported and distributed in Jamaica; however, stocks of Jadelle were depleted in June 2013. Sino-Implant (II) became available as a contraceptive option through international donations at select health centres. Norplant[®] (six rods, 36 mg levonorgestrel per rod) had been available in Jamaica for insertion until international discontinuation in 2008.

A comprehensive review of medical records was performed on all women who utilized an implant-related service at one of the six included health centres. Medical directors at each health centre identified and pulled records for review, and data on patient demographics, reproductive and contraceptive history, implant type, duration of use, and side-effects were documented in a data abstraction form. No identifying patient information was abstracted. Providers of reproductive health services at each site were asked to complete a survey on their knowledge and experience with contraceptive implants.

Statistical analyses

Data were entered and analysed with EPI-Info 7 (USD Inc, Stone Mountain, Georgia, USA) and SAS 9.3 (SAS Institute Inc, Cary, North Carolina, USA). Descriptive statistics (percentages and medians) were used to describe the characteristics of implant users and reproductive healthcare providers. Chi-square test and the Kruskal-Wallis test were used to compare the distributions of population parameters. This project was reviewed by the Ministry of Health, Jamaica, and the CDC, USA, and was determined to be 'public health practice'.

RESULTS

In total, 738 women received implant care during 2013. The median age was 26.0 years (Table 1). Overall, 24.3% of implant users were 13–18 years old, 21.8% were aged 19–24 years and 47.8% were aged 25–40 years. Health centres varied in the completeness of documentation of the women's education level, employment status and marital status: education level was missing for 64.1% of the women, employment status for 45.7% and marital status for 35.8%. Among

Table 1: Characteristics of 738 contraceptive implant users in six Jamaican public health centres, January 1–December 31, 2013

Characteristic	n (%) ¹
Age (years)	
13–18	179 (24.3)
19–24	161 (21.8)
25–40	353 (47.8)
41+	37 (5.0)
Median (interquartile range)	26.0 (19–32)
Missing data	8 (1.1)
Education level	
0–12 years (primary, secondary)	160 (21.7)
13+ years (college+)	105 (14.2)
Missing data	473 (64.1)
Employed	
Yes	177 (24.0)
No	224 (30.4)
Missing data	337 (45.7)
Marital status	
Married/living with a partner	136 (18.4)
Single	338 (45.8)
Missing data	264 (35.8)
Reproductive and contraceptive history	
Parity	
Nulliparous	71 (9.6)
1 child	329 (44.6)
2 children	154 (22.1)
3+ children	142 (19.2)
Missing data	42 (5.7)
Ever-use of contraceptives	
Yes	462 (62.6)
No	240 (32.5)
Missing data	36 (4.9)
Previously used contraceptive(s) ² (n = 462)	
Oral contraceptives	106 (22.9)
Intrauterine device	26 (5.6)
DMPA ³ injection	189 (40.9)
Contraceptive implants	107 (23.2)
Condoms	89 (19.3)

¹ Percentage total may be greater than 100 due to rounding.² Of those with ever-use of a contraceptive, the number and percentage with documented use of the listed contraceptive methods.³ Depot Medroxyprogesterone Acetate (eg Depo Provera).

women with available information, 21.7% had primary/secondary education, 24% were employed, and 45.8% were single. Over 85% of the women had one or more children. Over 62% of the women had documentation of having ever used contraceptives, of whom 19.3% had used condoms, 22.9% oral contraceptives, 5.6% IUD, 40.9% Depot Medroxyprogesterone Acetate (DMPA) and 23.2% contraceptive implants.

Of women having used an implant-related service, 493 (66.8%) had an implant inserted, 202 (27.4%) had an implant removal and 53 (7.2%) presented for routine follow-ups (10 women had the same implant inserted and removed in 2013) (Table 2). Of the 493 implant insertions, 57.8% were Jadelle and 42.2% were Sino-Implant (II). Complications following implant insertion were infrequent at all six health centres. There were five cases of rod expulsion after insertion and two cases of soft tissue infection. Three women (0.6%) had an identified pregnancy; all pregnancies occurred within three months (3, 7 and 11–12 weeks) after implant insertion.

Of the 202 implant removals, 61% were Norplant[®] (n = 121) and Implanon[®] (n = 2), 35% were Jadelle and 4% were Sino-Implant (II). The two Implanon[®] implants had been inserted outside of Jamaica. Ninety-eight per cent of Norplant[®] removals were per the manufacturer's recommended time for removal. Five per cent (n = 10) of the women had the same implant inserted and removed in 2013: half of these were Jadelle users and half were Sino-Implant (II) users. All Sino-Implant (II) removals and 46% of Jadelle removals were requested by the patient due to bleeding irregularities. Of the four brands, Norplant[®] had the highest occurrence (8%) of incomplete rod removals, compared to ≤ 1% for Jadelle and Sino-Implant (II).

No side-effects were documented for 68.5% of all users (Table 3). The side-effects recorded were irregular bleeding (includes irregular spotting, inter-menstrual bleeding, prolonged menses, or amenorrhea; 24%), headache (5.4%), abdominal pain (3.3%) and other (including vaginal discharge, nausea and acne; 6.6%). Documented side-effects did not differ statistically significantly by the type of implant (Jadelle or Sino-Implant (II)) inserted in 2013 (all *p*-values > 0.05). However, they did differ statistically significantly by the visit type: the 10 women with an implant insertion and subsequent removal in 2013 were more likely to have documented irregular bleeding (80%), compared with women with only an insertion (17%, *p* < 0.001) or removal (37%, *p* = 0.004) visit (data not shown).

Twenty-seven providers of reproductive health services were identified at the centres: 2 were unable to be reached, 5 did not respond and 20 (78%) completed the survey. Four providers reported having inserted more than 15 contraceptive implants per month during 2013 (Table 4). Fifteen providers reported that implants were unavailable for over half of the patient visits, with a reported median of 20

Table 2: Contraceptive implant visits, insertions and removals by implant type, Jamaica, 2013

	Jadelle (n = 387)	Sino-Implant (II) (n = 228)	Norplant®/ Implanon® (n = 123)	Overall n (%)
All implant visits				
Number of implant insertions	285 (73.6)	208 (91.2)	0	493 (66.8)
Number of implant removals ¹	70 (18.1)	9 (3.9)	123 (100)	202 (27.4)
Number of implant follow-up visits	37 (9.6)	16 (7.0)	0	53 (7.2)
Implant insertions (n = 493)	n = 285	n = 208	N/A	
Number of pregnancies following implant insertion ²	2 (0.7)	1 (0.5)	–	3 (0.6)
Number of complications following implant insertion and type:	2 (0.7)	5 (2.4)	–	7 (1.4)
Expulsion of implant rods	1 (0.4)	4 (1.9)	–	5 (1.0)
Soft tissue infection	1 (0.4)	1 (1.9)	–	2 (0.4)
Implant removals (n = 202)	n = 70	n = 9	n = 123	
Median time to removal (months) (interquartile range)	21.5 (13–28)	9 (4–11)	60 (59–61)	58 (23–60)
Reason for implant removal (n = 191)	n = 61	n = 9	n = 121	
Irregular bleeding ³	28 (45.9)	9 (100)	0	37 (19.4)
Pregnancy	1 (1.6)	0	0	1 (0.5)
Trying to conceive	5 (8.2)	0	0	5 (2.5)
Manufacturer recommended time to remove	0	0	121 (100)	121 (60.0)
Other ⁴	27 (44.3)	0	0	27 (13.5)
Number of incomplete implant rod removals	1 (1.4)	0	10 (8.1) ⁵	11 (5.4)

Percentage total may be greater than 100 due to rounding. Data presented as n (%) unless otherwise indicated.

¹ Ten women had the same implant inserted and removed within 2013.

² All pregnancies occurred within three months of contraceptive implant insertion.

³ Includes irregular spotting, inter-menstrual bleeding, prolonged menses, and amenorrhea.

⁴ Includes various complaints: back pain, vaginal discharge, dizziness, nausea, vomiting and one case of acne.

⁵ All incomplete implant rod removals occurred with Norplant®.

Table 3: Documented side-effects of contraceptive implants by implant type and by service visit type, Jamaica, 2013

Side-effects¹				
By implant type	Jadelle (n = 387)	Sino-Implant (II) (n = 228)	Norplant®/ Implanon® (n = 123)	Overall n (%)
Irregular bleeding ²	87 (22.5)	59 (25.9)	31 (25.2)	177 (24.0)
Headache	26 (6.7)	10 (4.4)	4 (3.3)	40 (5.4)
Abdominal pain	13 (3.4)	6 (2.6)	5 (4.1)	24 (3.3)
Other	35 (9.0)	10 (4.4)	4 (3.3)	49 (6.6)
None documented	265 (68.5)	160 (70.2)	82 (66.7)	507 (68.7)
By visit type	Insertion (n = 493)	Removal³ (n = 192)	Follow-up (n = 53)	p-value⁴
Irregular bleeding ²	84 (17.0)	66 (34.4)	27 (50.9)	< 0.001
Headache	18 (3.7)	16 (8.3)	6 (11.3)	0.002
Abdominal pain	9 (1.8)	13 (6.8)	2 (3.8)	0.012
Other	23 (4.7)	23 (12.0)	3 (5.7)	0.028
None documented	383 (77.7)	104 (54.2)	20 (37.7)	< 0.001

Percentage total may be greater than 100 due to rounding. Data presented as n (%) unless otherwise indicated.

¹ Total number of side-effects does not equal 738 (total population) as a patient may have more than one documented side-effect.

² Includes irregular spotting, inter-menstrual bleeding, prolonged menses, and amenorrhea.

³ The 10 women who underwent an insertion and subsequent removal of an implant in 2013 were excluded from the removal group for the analysis of implant side-effects with the assumption that their side-effect profiles were different from those of the 63% (n = 121) of women who underwent removal as per manufacturer recommendation. These 10 women were included in the insertion group for side-effect analysis.

⁴ Chi-square p-value for comparisons across three types of implant visit groups: insertions, removals and follow-up care.

Table 4: Characteristics and perceptions related to contraceptive implant availability of the 20 reproductive healthcare provider respondents, Jamaica, 2013

Characteristic	
Gender	
Male	5 (25.0)
Female	15 (75.0)
Role as reproductive healthcare provider	
Physician/resident physician	10 (50.0)
Nurse/nurse midwife	10 (50.0)
Approximate number of implants placed monthly (n = 16) ¹	
None	8 (50.0)
≤ 15	4 (25.0)
> 15	4 (25.0)
Training	
Number of years since last formal LARC training ²	
Never trained	10 (50.0)
1–5 years	2 (10.0)
> 5 years	8 (40.0)
LARC training received as of 2013 (n = 10) ³	
Jadelle	6 (60.0)
Sino-Implant (II)	1 (10.0)
Norplant®	8 (80.0)
Intrauterine device	9 (90.0)
Method(s) providers are requesting to receive more training (n = 18) ³	
Jadelle	6 (33.3)
Sino-Implant II	4 (22.2)
Intrauterine device	13 (72.2)
Implant availability	
Number of providers reporting that implants are unavailable at (n = 19)	
≤ 50% of visits	4 (21.1)
> 50% of visits	15 (78.9)
Reported number of patients requesting but unable to receive an implant (monthly)	
Median	20
Interquartile range	10–50

Percentage total may be greater than 100 due to rounding. Numeric data presented as n (%) unless otherwise indicated.

¹ Frequency of missing data: 4 (20%). Four providers did not answer this survey question.

² Refers to training of contraceptive implant or intrauterine device insertion. Two physicians and eight nurses were never trained.

³ Numbers may be greater than the number of reproductive healthcare providers surveyed because each provider may have been trained or was requesting training in more than one method.

(interquartile range: 10–50) patients per month who requested, but could not receive, an implant because of non-availability. Eight providers reported that it had been more than five years since their last formal LARC training, and 10 stated they had never received LARC training. Thirteen providers requested training on IUD insertion, and 10 wanted training on Jadelle or Sino-Implant (II). Six of the 10 physicians were trained to insert Jadelle, and one was trained to insert

Sino-Implant (II). None of the 10 nurses or nurse midwives/practitioners had training on contraceptive implant placement and did not perform implant insertions or removals.

DISCUSSION

In 2008, approximately 72% of women of reproductive age in Jamaica reported contraceptive use (1). Data showed that DMPA was the leading hormonal contraceptive method with over 20 000 acceptors annually from 2008 to 2012 (11). Oral contraceptive pills were the second most used method with over 9000 recipients. Comparatively, LARC was underutilized; IUDs were placed in slightly over 1000 women in 2012, whereas only an estimated 191 women had contraceptive implants inserted that year (11). Our medical record review is the first survey of contraceptive implant utilization patterns in Jamaica.

Sino-Implant (II), approved for use by the People's Republic of China in 1996, is a slightly less expensive levonorgestrel implant than Jadelle with a comparable safety and efficacy profile (12, 13). Sino-Implant (II) studies from the USA, Kenya and Pakistan have reported first-year discontinuation rates of 7% (12). A systematic review of Sino-Implant (II) studies reported first-year pregnancy rates of 0.0–0.1% and that menstrual disorders were the primary side-effect and reason for discontinuation (13). Sino-Implant (II) was introduced in Jamaica in 2013. As such, local data on its clinical use and safety/efficacy profile are limited.

This study showed that contraceptive implants had a favourable side-effect profile, but were underutilized among women in Jamaica. Consistent with national surveys of LARC trends in other countries, implant use in Jamaica was most prevalent in parous women aged 19–35 years (14). Changes in menstrual patterns were common and were the primary reason for premature implant discontinuation, consistent with previous studies (13, 15). The observed frequency of implant discontinuation for Jadelle and Sino-Implant (II) users in Jamaica was lower than those previously reported in other settings (12, 15).

Complications of sub-dermal implants were rare. Incomplete implant removal was the most frequently encountered complication, observed in 10 Norplant® and 1 Jadelle removals. Differences in side-effect profiles and frequencies of complications between Jadelle and Sino-Implant (II) were not statistically significant. Pregnancy with a contraceptive implant in place was infrequent among the women but higher than

observed first-year pregnancy rates of 0.0–0.1% with Sino-Implant (II) (13). All pregnancies were identified within three months after implant insertion suggesting pre-existing pregnancies. Clinical practice guidelines in Jamaica include urine pregnancy testing prior to implant insertion. The addition of a pregnancy exclusion checklist (16) to exclude very early pregnancies undetectable with urine pregnancy testing may minimize missed pregnancies.

The results of the reproductive healthcare provider survey highlighted two major barriers to implant uptake in Jamaica: low implant availability and suboptimal provider training. Systematic improvement and expansion of contraceptive implant training for reproductive healthcare providers to include nurse midwives/practitioners, along with increased continuing education programmes and import of lower-cost, equally effective implants such as Sino-Implant II, are strategies to increase implant utilization.

This study provided information on the use of contraceptive implants and their documented side-effects and complications in the Jamaican public sector. A limitation of this study was the absence of population-level utilization data for all available contraceptive methods in Jamaica. This made it difficult to estimate and compare usage patterns among contraceptive methods. We observed a higher percentage of prior implant use (23%) among women in our survey population compared to previously reported implant utilization rates in Jamaica. While we expected more prior use of implants in women who received implant services in 2013 compared to all Jamaican women, inconsistencies in medical documentation may also be partly responsible for this. An additional limitation of our study was the wide variation in the completeness of medical documentation across health centres. It is possible that side-effects may have been under-reported among implant users. Additionally, such variation limited the robustness of some of the analyses and the ability to make cross-group comparisons. Standardization of contraceptive medical reporting at Jamaican health centres outlining users' pertinent demographics and contraceptive and reproductive health history may aid in the systematic collection of relevant information on women receiving contraceptives, thereby allowing for more effective public health planning and policy formation.

CONCLUSION

This study supports the growing evidence that contraceptive implants offer a safe and effective contraceptive

option for women of reproductive age, including nulliparous and adolescent women (17). However, implant utilization in Caribbean nations such as Jamaica will rely on having low-cost options and uninterrupted supply, supported by dedicated funding and concerted efforts for their procurement. Engagement of international partners for LARC donations, as well as increased import of lower-cost, equally effective contraceptive implants, such as Sino-Implant (II), are potential ways for Jamaica and other resource-limited settings to enhance availability. Improved system informatics for medical documentation of implant requests and usage can also aid in the maintenance of adequate stocks. Increased availability as well as targeted training of reproductive healthcare providers on methods for contraceptive implant counselling and placement would increase uptake. Reaching more women in need of LARC will ultimately contribute to a reduction in rates of unintended pregnancy in Jamaica and prevent its negative individual, societal and economic consequences.

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AUTHORS' NOTE

The opinions expressed in this article are those of the authors and do not necessarily reflect the official position of the CDC, USA.

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