DOI: 10.21509/idpub.2020.07.28

COMPARISON OF TWO SUBDERMAL CONTRACEPTIVE IMPLANTS IN A TERTIARY HOSPITAL IN SOUTHERN NIGERIA

***Nonye-Enyidah Esther Ijeoma[1], Wekere Felix Chikaike Clement[1] & Enyidah Nonyenim Solomon[2]**

[1]Department of Obstetrics and Gynaecology, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, **NIGERIA**
[2]Department of Medicine, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, **NIGERIA**
Correspondence: Nonye-Enyidah Esther I
Email: hernsi@yahoo.com

ABSTRACT

Background: Jadelle and implanon are second generation progesterone-only subdermal contraceptive implants (POSCIs) that replaced norplant. They are the most effective reversible contraceptive with similar effectiveness to sterilization. Objective: To determine the use prevalence of subdermal contraceptive implants and compare the use of jadelle and implanon at the Rivers State University Teaching Hospital, Port Harcourt (RSUTH). Methods: This was a retrospective comparative study of 561 clients that accepted and used subdermal contraceptive implants at the family planning clinic of RSUTH from 1st January, 2008 to 31st December, 2017. Their cards were retrieved from the clinic and reviewed. Data was extracted, coded and analyzed using the statistical package for social sciences (SPSS) IBM version 25.0 (Armonk, NY). Chi square test was used as test of significance where applicable and a p-value <0.05 was considered statistically significant. Results: The use prevalence of subdermal implants among 1893 contraceptive acceptors during the study period was 561 (29.6%). Implanon was more preferred by the women. Age and parity had significant effects on the preferred implant with P values <0.001 (95% CI: 0.000, 0.000) and <0.001 (95% CI: 0.000, 0.000) respectively. The POSCI acceptors were between the ages of 19 and 49 years. The mean age ± SD for POSCI acceptors was 32.4 ± 4.9 years. The modal parity was para 4. Most (97.7%) of the acceptors had formal education, were married 541 (96.4%) and multiparous 404 (72%). Conclusion: The uptake rate of the subdermal implants was low. Implanon was more popular. Age and parity had significant effects on the contraceptive choice.

Keywords: Contraception, Subdermal implants, Jadelle, Implanon, Comparison, RSUTH.

INTRODUCTION

Subdermal contraceptive implants were introduced more than 30 years ago and are one of the most effective contraceptives available.[1,2] Implants are thin, flexible rods inserted beneath the skin of a woman's upper arm, 8-10cm above the medial epicondyle of the humerus. They provide sustained contraception ranging from 3 to 5 years with a typical use pregnancy rate of 0.05%. After removal, there is no delay in the return to fertility. [3]

Norplant was the first contraceptive implant with 6 rods (2.4mm x 34mm) each containing 36mg of levonorgestrel. Its production was discontinued in 2008 because of the second generation implants namely implanon and jadelle which are easier to insert and remove. Jadelle was approved by United States Food and Drug Administration (USFDA) in 1996 and consists of two rods (2.5mm x 43mm) each containing 75mg of levonorgestrel effective for 5 years.

Implanon was introduced in 1998 and approved in 2006 by USFDA. It is a single rod (2mm x 40mm) implant containing 68mg etonogestrel effective for 3 years. [2, 5, 6]
Jadelle and implanon were introduced in Nigeria contraceptive market in 2006 [7] and since then several studies have been done on them. [7-10] They act by suppressing ovulation, thickening the cervical mucus and thinning of the endometrium. [1,2,4] They do not have oestrogen related side effects like increased risk of deep vein thrombosis, pulmonary oedema, stroke and myocardial infarction. The subdermal implants protect against endometrial cancer, ovarian cancer, pelvic inflammatory disease, uterine fibroids, and ectopic gestation. They are ideal for sicklers and epileptics because they prevent sickling of cells thereby reducing sickle cell crisis and frequency of seizures. The incidence of primary amenorrhoea, premenstrual tension and ovulation pain is reduced with the use of the implants. [11,12] Since the establishment of the family planning clinic at the RSUTH, there has not been any study comparing the use of these subdermal implants; hence the need for this study.

MATERIALS AND METHODS

A retrospective comparative study carried out at the family planning clinic of the RSUTH in Port-Harcourt, the capital of Rivers State in South-South geopolitical zone of Nigeria. The clinic gets its clients from within Port Harcourt and its environment. The clinic is headed by a consultant Gynaecologist, with the support of trained family planning nurses and resident doctors.

After counseling by the family planning nurses and physicians, the clients were allowed to make informed choice based on their needs and available contraceptives suitable for them. Thereafter medical history and clinical examination were done to exclude contraindications to the use of subdermal contraceptive implants. Urine analysis and pregnancy test were also done for the clients and informed consent obtained. During the study period, the only available subdermal implants were jadelle and implanon. The nurses inserted one or two rods of implanon or jadelle respectively 8-10cm above the medial epicondyle of the humerus subdermally, to avoid the risk of neurovascular damage at insertion and removal. The insertion was done within 7 days of normal menstrual period after excluding pregnancy. They were also inserted within 21 days post partum in breastfeeding mothers who were yet to resume menstruation. Following insertion, the service provider confirmed the presence of the implant by palpation and also asked the client to do so. Thereafter the procedure was documented including the arm the implant has been inserted into and that it was felt. The date of the removal of the implants was also documented. Follow up observations were done.

At each visit, the client's complaints were documented and appropriate treatment given. The weight, blood pressure and results of urinalysis were also noted. The record cards of all the clients that accepted the POSCIs between 1st January, 2008 and 31st December, 2017 were retrieved and studied. The information extracted from the cards included the socio-demographic characteristics of the clients, indications for their use and source of information concerning contraception. The data was analyzed with the statistical package for social sciences (SPSS) IBM version 25.0 (Armonk, NY) using frequency counts and percentages. Chi square test was used as test of significance where applicable and a p-value <0.05 was considered statistically significant. Level of confidence interval was set at 95%.

RESULTS

Five hundred and sixty one (561) clients made subdermal contraceptive implants their method of choice during the study period, accounting for 29.6% out of the 1893 contraceptive acceptors. Of the 561 acceptors, 308 (54.9%) chose implanon and 253 (45.1%) chose jadelle.

This makes implanon a more popular implant as shown in figure 1. There was no accidental pregnancy recorded during the study period. The POSCI acceptors were between the ages of 19 and 49 years. The mean age ± SD for implant acceptors was 32.4 ± 4.9 years. The mean age ± SD of the acceptors of jadelle was 33.4 ± 4.9 years compared to 31.4 ± 4.9 years for implanon. The modal parity of the two contraceptives was para 4. The socio demographic profile of the acceptors of the implants is shown in table 1. The modal age group was 30-34 years accounting for 219 (39%) clients. Five hundred and forty eight (97.7%) clients had formal education. Most of the acceptors with formal education, 394 (70.2%) had secondary level of education. Five hundred and thirty four (95.2%) clients were Christians. Most of the women, 404 (72%) were multipara and married women accounted for 541 (96.4%) of the clients that used POSCIs during the study period.

Of the socio-demographic characteristics of the acceptors subdermal implants, age (X^2= 25.43, $P < 0.001$) and parity (X^2=35.53, $P < 0.001$) were statistically significant. While educational status (X^2= 10.53, $P = 0.018$), religion (X^2= 1.522, $P = 0.467$), and marital status (X^2= 3.383, $P = 0.066$) were not statistically significant (Table 1).

Table1. Socio-demographic characteristics of the clients

Variable	**Implanon**	**Jadelle**	POSCIs (%)	X^2 (d.f)	P-value
	No	No			
Age					
<20 20-24 25-29 30-34 35-39 40-44 45-49	3 23 78 124 63 16 1	1 2 47 95 79 25 4	0.7 4.5 22.3 39.0 25.3 7.3 0.9	25.43 (6)	<0.001*
Educational Status					
No formal education Primary Secondary Tertiary	6 11 209 82	7 17 185 44	2.3 5.0 70.2 22.5	10.53 (3)	0.018
Religion					
Christianity Islam Others	296 6 6	238 6 9	95.2 2.1 2.7	1.522 (2)	0.467
Parity					
Nullipara Primipara Multipara Grand- multipara	8 35 228 37	4 4 176 69	2.1 7.0 72.0 18.9	35.53 (3)	<0.001*

Marital Status					
Single Married	15 293	5 248	3.6 96.4	3.383 (1)	0.066

The sources of information on contraception are shown in Table 2. Three hundred and ninety eight (70.9%) clients obtained their information on implants from clinic personnel and 76 (13.6%) from friends and relatives. Thirty two (5.7%), 12 (2.1%), 10 (1.8%) and 10 (1.8%) clients got theirs from community health workers, print media, radio/television and outreach respectively. There was no significant difference in the sources of information on contraception for jadelle and implanon ($X^2 = 13.841$, $P = 0.031$).

Table 2. Comparison of sources of information on contraception

Variable	Implanon	Jadelle	POSCIs	X2 (d.f)	P-value
Sources of information	No. of Clients	No. of Clients	%		
Clinical personnel Friends/Relatives Community Health Worker Print Media Radio/Television Outreach Others	231 34 16 9 2 3 13	167 42 16 3 8 7 10	70.9 13.6 5.7 2.1 1.8 1.8 4.1	13.841 (6)	0.031

More than 65% of the clients used the subdermal implants for spacing of childbirth, 29.1% had completed the family size and were using the implants to prevent further pregnancy. There was no reason for their use recorded in the cards of 26 (4.6%) clients. There was no statistically significant difference in indications for the use of implanon and jadelle. ($X^2 = 4.277$, $P = 0.118$). This is shown in table 3.

Table 3. Indications for use of POSCIs

Variable	Implanon	Jadelle	POSCIs	X2 (d.f)	P-value
Indication for use	**No. of Clients**	**No. of Clients**	%		
Birth spacing Completed family size Not recorded	196 100 12	176 63 14	66.3 29.1 4.6	4.277 (2)	0.118

The yearly trend of acceptance of subdermal implants over the study period is shown in figure 2.

Figure 1. Preferred Progesterone only subdermal contraceptive implants (POSCIs).

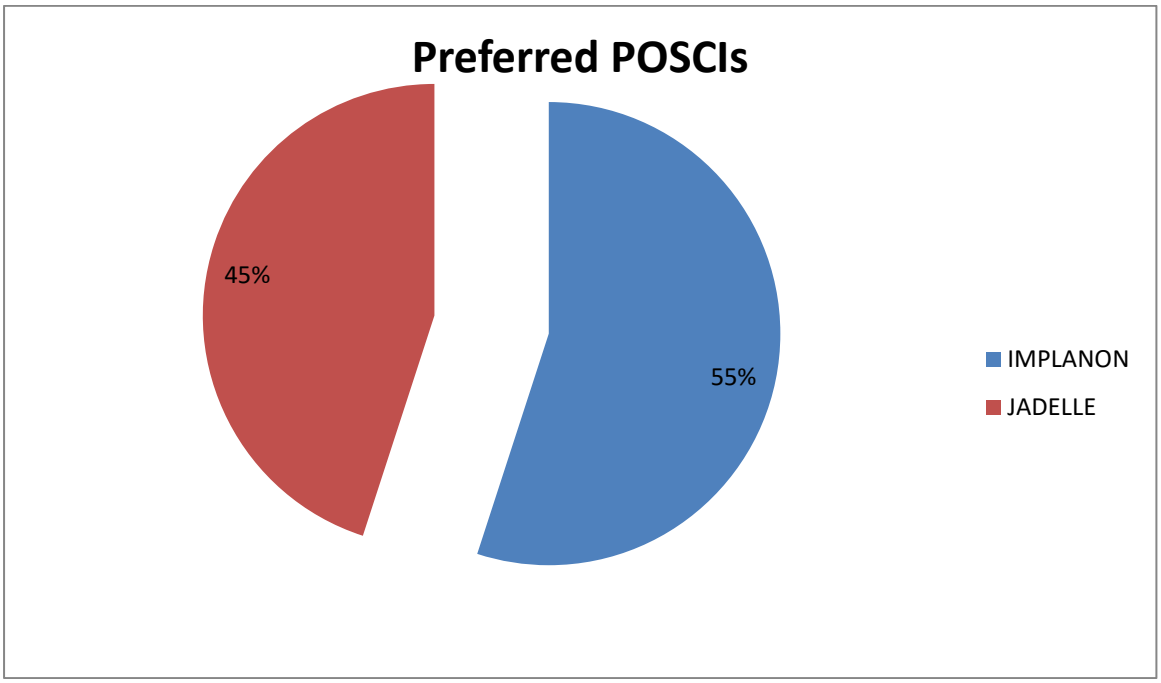
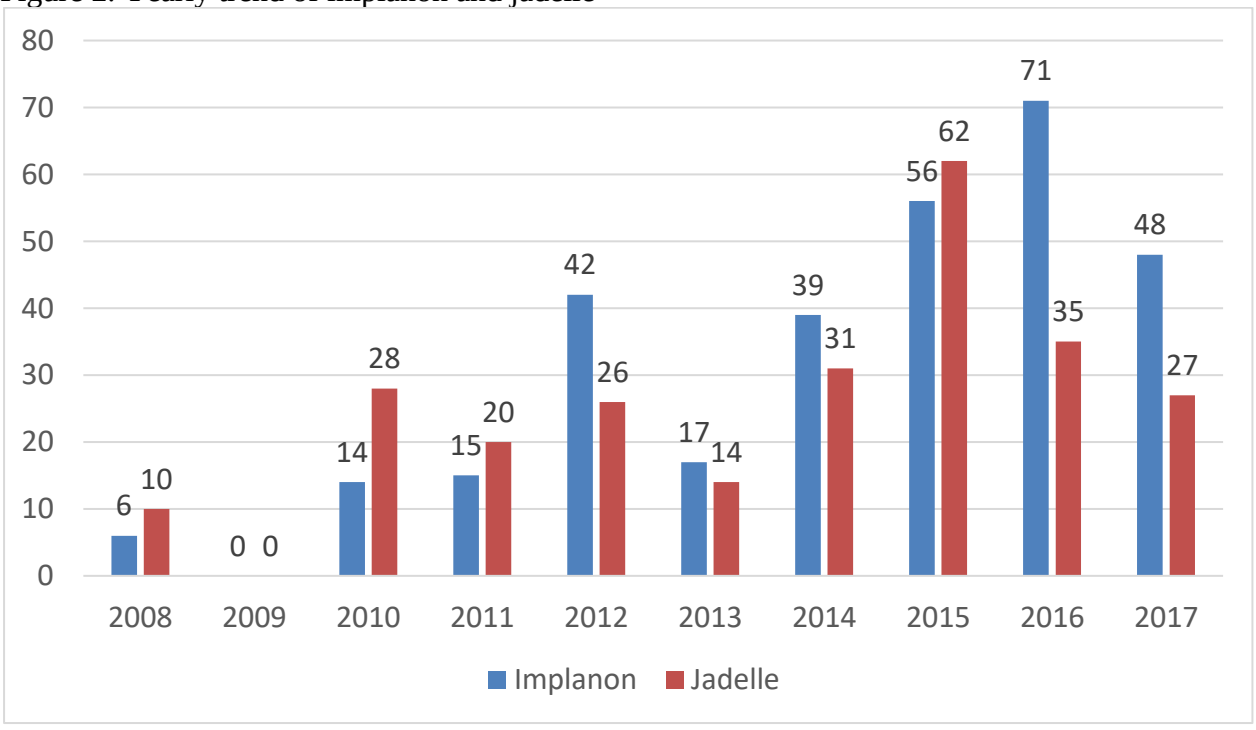


Figure 2. Yearly trend of implanon and jadelle



DISCUSSION

The prevalence of subdermal contraceptive implants in this study is 29.6%. This is slightly lower than 31.9% from Abakaliki [13] but higher than 7%, 13.4%, 4.3%, 4.3%, 18.6% and 15.3% from Zaria, Jos, Port Harcourt, Ibadan, Uyo and south western Nigeria respectively. [7-10,14,15] The higher prevalence rate noted in this study and that from Abakaliki may be because of increase in awareness of these implants compared to the earlier studies done when

the implants were newly introduced in Nigeria. There was no report of accidental pregnancy during the study period. This confirms the high efficacy of these subdermal contraceptive implants as documented in other studies. [7-10, 14, 15] Therefore they are good option for women who have completed the family size especially in Nigeria where there is a great aversion for tubal ligation. [16] An essential element of implant provision which was properly documented in the clients' cards is ensuring that the clients are counseled well before insertion. This enables them to be aware of the side effects to expect and probably reduce discontinuation rate. [1,5,6]

Jadelle and implanon were the two POSCIs available at the family planning clinic of RSUTH during the study period. The number of acceptors of implanon was more than those that accepted jadelle. This finding is similar to findings by Adeyemi et al [15] unlike other studies where jadelle was more preffered. [13,14] The highest barrier to implant use is that they are expensive in addition to their infrequent supply.[14] Also the cost of training and retraining of the service providers with the technique of insertion and removal of the implants contribute to the high cost of these implants. This has led to the reduced provision of these implants in developing countries like Nigeria.[14] This played out in this study where in 2009 there was no supply of these contraceptives and subsequently a few irregular supply was also noticed.
Acceptors of sudermal implants were between the ages of 19 and 49 years with mean age $\pm$ SD of 32.4 $\pm$ 4.9 years and most were in 30-34 years age group. This is similar to other studies. [8,13-15,17] Less than 1% of the clients in this study were adolescents in contrast to results from other studies.[17,18] This poor acceptance rate by the teenagers could be that they patronize the chemist shops as they probably would not want to be identified by the service providers as being sexually active. [19] Nevertheless, adolescents have been shown to be an ideal population for implant use as shown by CHOICE project [20] where there were good acceptance and continuation rates among adolescents.

More than 97% of the acceptors in this study had formal education. This is expected as studies have shown that formal education significantly increases the use of contraceptives. [21] Most of the acceptors were multipara and married. This is in keeping with other studies. [8,9,14] It is not surprising that most of the clients were Christians as majority of the population in south south Nigeria are Christians.

The socio-demographic characteristics of the acceptors of implanon and jadelle found to be statistically significant included age ($P < 0.001$) and Parity ($P < 0.001$) respectively. This finding is first of its kind because the previous studies on subdermal implants did not document similar findings. Older women were more likely to use the contraceptives than younger age group. The study revealed no statistically significant effect of educational status ($P = 0.018$), religion ($P = 0.467$), and marital status ($P = 0.066$) on the use of both implanon and jadelle.
About two thirds of the clients used subdermal implants for birth spacing implying that this method of contraception is highly acceptable to our women for short term prevention of pregnancy. Slightly less than one third (29.1%) of our clients had completed the family size and were using the contraceptives to prevent further pregnancy. This finding which is similar to that of Abasiattai et al is not surprising since our women prefer other methods of contraception to having bilateral tubal ligation because of cultural and religious beliefs. [14,16,22]

The main source of information on subdermal implants was from clinical personnel accounting for 70.9%. This is similar to other studies. [8,9,14,23,24] Only 3.9% came from print media, radio and television. The contribution from media houses was low and could explain the low

uptake rate of these implants in Nigeria. Therefore there is need to improve on the awareness of contraceptives through media to increase the uptake rate. There was no significant difference when the sources of information were compared between the acceptors of jadelle and implanon ($P = 0.031$).

CONCLUSION

Subdermal contraceptives implants are very effective and safe long acting reversible contraceptives used mainly by young, educated, married and multiparous women who mostly preferred to space childbirths. Implanon was more popular than jadelle and their uptake rate was low. Clients' age and parity were the only factors found to have effect on the use of both contraceptives.

ETHICAL APPROVAL

Ethical approval was given by the Hospital's Ethics committee.

ACKNOWLEDGEMENT

We are grateful to the staff of the family planning clinic, RSUTH for the assistance rendered for this study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

FUNDING

This was done by the authors.

REFERENCES

1. Ramchandran D, Upadhyay UD. (2007) Implants: the next generation. Population Reports. October, 7, 1–19.
2. Hohmann H, Creinin MD. (2007) The contraceptive implant. Clinical Obstetrics and Gynecology, 50 (4): 907–917.
3. Trussell J. (2011) Contraceptive failure in the United States. Contraception, 83, 397-404.
4. Mansour D. (2010) Nexplanon®: what Implanon® did next. Journal of Family Planning and Reproductive Health Care, 36(4): 187.
5. Grimes DA. (2009) Forgettable contraception. Contraception, 80 (6):497–499.
6. Hubacher D, Kimani J, Steiner MJ, Solomon M, Ndugga MB.(2007) Contraceptive implants in Kenya: current status and future prospects. Contraception, 75 (6): 468–473.
7. Madugu NH, Abdul MA, Bawa U, Kalawole B. (2015) Uptake of hormonal implant contraceptives in Zaria, Northern Nigeria. Open J Obstet Gynaecol, 5: 268-73.
8. Mutihir JT, Nyango DD. (2010) One-year experience with implanon subdermal Implants in Jos Nigeria. Nig J Clin Pract, 13: 28-31.
9. Ojule JD, Oranu EO, Enyindah CE. (2012) Experience with implanon in Southern Nigeria. J Med Sci, 3: 710-4.
10. Roberts AO, Morhason-Bello IO, Okunlola MA, Adekunle AO. (2015) Profile of implanon acceptors and pattern of side effects. J Reprod Contracept, 26:46-52.
11. Burkman R and Amnon B. (2013) Contraception and Family Planning. In: Decheney AH (Ed.). Current Diagnosis and Treatment Obstetrics and Gynaecology, Lange Medical Book, McGraw-Hill Companies, New York, 928-947.

12. Njoku CO, Emechebe CI, Iklaki CU, Njoku AN, Ukaga JT. (2016) Progestogen-Only Injectable Contraceptives: The Profile of the Acceptors, Side Effects and Discontinuation in a Low Resource Setting,Nigeria. Open J Obstet Gynecol, 6:189-95.
13. Igwe NW, Nnamdi EB, Jude AJ. (2016) A 5-year clinical evaluation of subdermal implants among abakaliki acceptors. J Basic Clin Reprod Sci, 5: 1-5.
14. Abasiattai AM, Utuk NM, Inyang-Etoh EC. (2014) Subdermal contraceptive implants: Profile of acceptors in a tertiary hospital in Southern Nigeria. Int J Gynaecol Obstet Neonatal Care, 1: 9-13.
15. Adeyemi AS, Owonikoko KM, Adekanle DA, Aworinde O. (2018) Subdermal contraceptive implants: Experience at a tertiary health institution in southwestern Nigeria. Sahel Medical Journal, 2018; 21: 137-40.
16. Adekanle DA, Afolabi AF, Adeyemi AS. (2013) Terminal fertility control: Clients own reason for the choice of the contraceptive method. Open J Obstet Gynaecol, 3: 706
17. Mastor A, Khaing SL, Oman SZ. (2011) User's perspective on implanon in Malaysia: a multicultural perspective Asian country. Open Access J Contraception, 2: 79-84.
18. Bhatia P, Nangia S, Aggarwal S, Tewari C. (2011) Implanon: subdermal single rod contraceptive implants. J Obstet Gynaecol India, 61(4): 422-425.
19. Oye-Adeniran BA, Adewole IF, Umoh AV, Oladokun A, Gbadegesin A, Odeyemi KA. (2005) Sources of contraceptive commodities for users in Nigeria. PLOS Medicine, 2(11): e306.
20. Mestard R, Secura G, Allsworth JE, Madden T, Zhao Q, Pelpert JF. (2011) Acceptance of long acting reversible contraceptive methods by adolescent participants in the contraceptive CHOICE project. Contraception, 85: (5): 493-498.
21. National Population Commission, ICF International. (2014) Nigeria Demographic and Health Survey 2013. Abuja, Nigeria and Rockville, Maryland, USA: NPC and ICF International, 97.
22. Adeyemo AR, Oladipo A, Omisore AO. (2012) Knowledge and practice of contraception among women of reproductive ages in South West Nigeria. Inter J Engin Sc, 1(2): 70–6.
23. Isah AY, Nwobodo EI. (2009) Family planning practice in a tertiary institution in North Western Nigeria. Nig J Clin Practice, 12(3): 281-283.
24. Utoo BT, Mutihir TJ, Utoo PM. (2010) Knowledge, attitude and Practice of Family planning methods among women attending antenatal clinic in Jos, North-Central Nigeria. Nig J Med, 19(2): 214-218.