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CLINICAL ARTICLE

Obstetrics

Acceptability of ENG-releasing subdermal implants among postpartum Brazilian young women during the COVID-19 pandemic

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Abstract

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Objective: To evaluate etonogestrel (ENG)-implant acceptance during the immediate postnatal period among adolescents and young women during the COVID-19 pandemic, and to compare variables according to choice and discuss possible implications of this measure during the pandemic period.

Methods: A cross-sectional study was designed. All women aged up to 24 years, who delivered between April 25, 2020, and June 24, 2020, at Women's Hospital, University of Campinas, São Paulo, Brazil were considered. The ENG-implant or other contraceptive methods were offered prior to hospital discharge. The participants were split into two groups: (1) those who chose the ENG-implant and (2) those that refused the implant. Descriptive, bivariate, and multivariate analyses were performed.

Results: 151 women were included, with 76.2% selecting the ENG-implant. The average age was 19.5 years; 73.2% of pregnancies were unplanned, 32.5% already had a previous pregnancy, 74% were single, and 75.5% were not in full time education. Further, 70.5% had previously used contraceptives, with 89.1% unsatisfied with their previous method that opted for the ENG-implant (P = 0.07).

Conclusion: Offering the ENG-implant to youths during the immediate postnatal period is evidence-based care, and contraceptive provision is an essential health promotion tool, even during a pandemic. Thinking quickly about public policies in times of crisis is important to guarantee sexual and reproductive rights.

KEYWORDS

contraception, COVID-19, ENG-implant, postpartum, subdermal implant, young women

1 | INTRODUCTION

Over the past 12 months, the coronavirus disease 2019 (COVID-19) pandemic has resulted in a public health emergency which has imposed a new reality on healthcare systems worldwide, with the first Brazilian case confirmed in February 2020.^{1,2}

Reduced and canceled family planning and postnatal consultations, which are not considered emergency services, were a consequence of the health services' reorganization due to the pandemic, compromising access to postpartum contraceptive methods. Normally, roughly 40% of women requiring postnatal contraception do not have access to contraceptive methods,

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and with the current situation, this number is likely to increase significantly. $^{\rm 3}$

Offering long-acting reversible contraceptive (LARC) methods during the immediate postnatal period, prior to hospital discharge, is paramount when considering the current pandemic.⁴ LARCs are considered the best reversible methods for preventing unplanned pregnancies, which include those that are mistimed, and rapid repeat pregnancies (RRP), defined as pregnancy occurring less than 18 months after a live birth.⁵ When applied during the immediate postnatal period, these methods lead to a significant drop in the rate of RRP compared to other contraceptives.⁶

Strategies to prevent teenage pregnancy are of utmost importance, and this issue remains a public health problem worldwide. Recently, the concept of adolescence has been updated in order to provide a more comprehensive definition, which incorporates the biological growth and social changes that occur from 10 to 24 years of age. This new age group, known as 'young women', is more comprehensive and better adapted to the standards and requirements of a modern society, which leads to improved support, protection, and empowerment.⁷

In general, teenage pregnancy—and more specifically, RRP exposes young mothers and their offspring to a number of health and socioeconomic risks, including increased rates for preterm birth, low birth weight, small for gestational age, and infant and early childhood mortality. In addition, these women are more likely to drop out of school and to earn lower salaries when they do work.^{8,9}

From the beginning of this study, an upward trend in the number of COVID-19 cases was observed in the reference municipality. Figure 1 shows the distribution curve of confirmed COVID-19 cases, according to symptom onset date and 7-day moving averages of cases in Campinas, Brazil, in 2020. The blue rectangle represents the study period and the red rectangle represents the period in which the young women should have returned for postnatal consultations, coinciding with the peak of the pandemic and cancellation of all elective consultations.

The aim of this study was to evaluate the acceptance of the ENG-implant during the immediate postnatal period among young

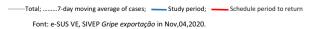


FIGURE 1 Study period and schedule period for the women returning for postpartum review according to number and 7-day moving average of cases in Campinas, Brazil. women, prior to hospital discharge, during the COVID-19 pandemic, as well as to compare some variables according to the chosen contraceptive method (Table 1).

2 | MATERIALS AND METHODS

This study was approved by the Ethics and Research Commission of UNICAMP (CAAE: 92869018.5.0000.5404) and followed the Declaration of Helsinki and Resolution 466/12 of the National Health Council according to the guidelines and regulatory norms of research involving human beings. All participants signed a consent form. If the woman was a minor, counseling and obtaining information was carried out in the presence of the parents or a legal representative. After reading, understanding, and clarifying any doubts, all participants under the age of 18 signed an informed consent form, and a counter signature from their legal representative was also obtained. Participants over the age of 18 years signed their own consent form.

We conducted a cross-sectional study at the Women's Hospital, University of Campinas Medical School, Campinas, São Paulo, Brazil. The aforementioned public hospital is a tertiary referral unit with an average of 200 births per month.

All women up to 24 years of age, who gave birth at the study center between April 25 and June 24, 2020, underwent appropriate counseling regarding effectiveness, characteristics, possible side effects, and shelf life for all contraceptive methods used in the postnatal period. All women were offered the ENG-implant (Implanon NXT; Merck Sharp & Dohme Corp., Kenilworth, NJ, USA) prior to hospital discharge, or other routine contraceptive methods, including the copper IUD (immediate postpartum or after 40 days), depot medroxyprogesterone acetate (DPMA), or the desogestrel progesterone-only-pill (POP), to initiate up to 40 days postpartum. The subdermal implant is not routinely available in Brazilian public hospitals due to its high cost.

The sample was intentional, comprising all young women up to 24 years of age that gave birth in our hospital during the study period. Exclusion criteria were those who chose not to use any contraceptive method or presented a category 3 or 4 contraindication for the use of the ENG-implant according to the World Health Organization (WHO) Eligibility Criteria: past or current breast cancer, systemic lupus erythematosus with positive antiphospholipid antibodies, current or history of ischemic heart disease, history of cerebrovascular accident, hepatocellular adenoma, hepatoma, and severe cirrhosis.¹⁰

Insertion of the subdermal implant and guidance regarding its use were performed by gynecologists with expertise in their placement. The implant was inserted with the woman in the supine position, and the medial aspect of the upper arm exposed (the left arm if right-handed, and the right arm if left-handed), approximately 6-8 cm above the elbow crease, posterior to (below) the sulcus between the biceps and triceps muscles. Using an appropriate aseptic technique, local anesthetic (2 ml of 1% lidocaine) was applied, and the implant was placed in the subdermal connective tissue via its

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TABLE 1Sociodemographic, obstetrics and gynecological characteristics of postpartum young women according to ENG-implantacceptance.

	Accept ENG-implant						
	Yes		No	_			
	(n)	%	(n)	P value (n)	PR (CI 95%)		
Age (years)				0.9513			
<20	57	77.0%	17		1.01 (0.84-1.2		
20-24	59	76.6%	18		ref		
Skin color				0.0135			
Missing	1		0				
White	36	65.5%	19		ref		
Non-white	79	83.2%	16		1.27 (1.03-1.5		
Marital status				0.6492			
Without partner	48	75.0%	16		0.96 (0.80-1.1		
With partner	68	78.2%	19		ref		
Student				0.0473			
No	92	80.7%	22	2.1.2	1.24 (0.97-1.60		
Yes	24	64.9%	13		ref		
School level	21	01.770	10	0.2574*			
None	0		1	0.2374			
Elementary	17	81.0%	4		1.05 (0.84-1.3		
High school	99	76.7%	30		ref		
BMI (kg/m ²)	77	/0./%	30	0.1776	rei		
	,		,	0.1776			
Missing	6	05.0%	6				
Underweight	20	95.2%	1		1.27 (1.06–1.5		
Normal	39	75.0%	13		ref		
Overweight	34	81.0%	8		1.08 (0.71-1.6		
Obese	17	70.8%	7		0.94 (0.59-1.5		
Number of pregnancies				0.7913			
1	79	77.5%	23		ref		
2 or more	37	75.5%	12	0.97	(0.61–1.55)		
Previous miscarriage				1.0000*			
No	102	76.7%	31		ref		
Yes	14	77.8%	4	0.97	(0.61–1.55)		
Menstrual model				0.6694			
Missing	0		2				
Regular	75	78.9%	20		ref		
Irregular	41	75.9%	13	0.96	(0.61–1.52)		
Previous contraception				0.0657			
Missing	0		2				
Yes	86	81.9%	19		1.20 (0.96-1.5		
No	30	68.2%	14		ref		
Planned pregnancy							
Missing	8		9	0.0215			
Unplanned pregnancy	86	84.3%	16		1.28 (0.99–1.6		
Planned pregnancy	21	65.6%	10		ref		
Satisfaction with previous contraceptive me		00.070	11	0.0225	101		

TABLE 1 (Continued)

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	Accept ENG-implant						
	Yes	Yes					
	(n)	%	(n)	P value (n)	PR (CI 95%)		
Missing	5		8				
Satisfied	35	71.4%	14		ref		
Unsatisfied/indifferent	49	89.1%	6		1.25 (1.02–1.52)		
Newborn weight (g)				1.0000*			
Missing	6		1				
<2500	13	76.5%	4		1.00 (0.76-1.33)		
≥2500	97	76.4%	30		ref		
Gestational age at birth (wks)				0.7730*			
Missing	4		1				
<37	14	73.7%	5		0.95 (0.72–1.27)		
≥37	98	77.2%	29		ref		
Locale of ANC				0.5899*			
Study center	40	0.81633	9		1.10 (0.92–1.32)		
Other	74	74.0%	26		ref		
Did not attend	2	100.0%	0				

Bold values indicates statistical significance.

Abbreviations: ANC, antenatal care; CI, confidence interval; ENG, etonogestrel; PR, prevalence ratio.

*Fisher exact test.

own application device.¹¹ Position of the implant was confirmed by palpation of the insertion site. Following insertion, occlusive dressings were applied, and the user card filled-out and given to the patient. Individuals who opted for other contraceptive methods were prescribed to initiate these by 40 days postpartum.

After the choice, participants were divided into two groups:

- Implant—the first group composed of individuals who chose the ENG-implant, or;
- No-implant—the second group composed of those that refused the implant. The sample was intentional, comprising all individuals that gave birth during the study period.

Data regarding age, skin color, marital status, schooling, body mass index (BMI, calculated as weight in kilograms divided by height in meters squared), previous menstrual period pattern, parity, comorbidities, location and number of antenatal consultations, previous contraceptive method used and satisfaction with said method, unplanned pregnancy, mode of childbirth, newborn weight, and Apgar score were collected and evaluated.

Data were collected by trained gynecologists through questions asked directly to individuals and some information was obtained from medical records. They were grouped in a collection form elaborated specifically for this study and organized in tables on the Epilnfo[™] physical base, with manual review and double typing. An identification number was assigned to each woman, to avoid mixing data. Completed forms were reviewed and the data were entered into a database by two different individuals (MMB, ADS) so as to avoid data loss and typing errors. All data collected will be stored for a maximum of five years, maintaining appropriate confidentially, under the responsibility of the primary researcher (MMB).

The sample profile was described using frequency analysis for categorical variables. The mean and standard deviation were used to describe continuous variables. Characteristics from both groups were compared using the Student *t*-test when the variable followed a normal distribution or the Mann–Whitney *U* test for variables where normality was not achieved. Qualitative variables were represented as a percentage and groups compared using the Chi-squared test. The logistic regression with Cox adjusted was used to multivariate analysis to those variables that presented *P* < 0.05 in the bivariate analysis. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement items were followed and confirmed in this manuscript.¹²

3 | RESULTS

From April 25 to June 24, 2020, 172 females aged up to 24 years gave birth. All were invited to participate in this study, with 21 participants refusing, resulting in a total of 151 individuals for inclusion in the study. None of the individuals who participated presented any exclusion criteria and 115 individuals accepted the ENG-implant (Figure 2).

The implant acceptance rate was 76.2%. The participant average \pm SD age was 19.5 \pm 2.7, and five were under 15 years old. Overall, 32.5% were multigravidas, 74.0% were single, 25.8% reported the pregnancy being planned, 57.5% were non-white, and 75.5% had

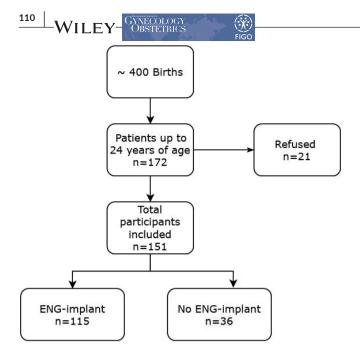


FIGURE 2 Flowchart of participating subjects.

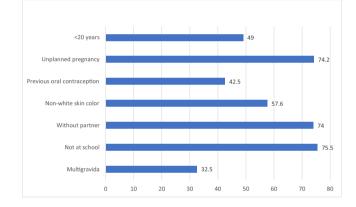


FIGURE 3 Characteristics of participating postpartum subjects.

dropped out of school. Use of oral contraceptives was reported by 42.5% of participants who had used contraceptives prior to pregnancy, while 29.5% did not previously use any contraceptive methods. Almost half were overweight or obese, 62.9% had a vaginal birth, 83.4% at term, and 88.2% gave birth to newborns weighing more than 2500 g. The average number of antenatal consultations was eight, while two women did not receive any antenatal care. Some of the general characteristics of the sample are shown in Figure 3.

Of the participants who chose the ENG-implant, the majority had previously used other contraceptive methods, with 65.2% being dissatisfied with their previous methods used. Only one individual had used an IUD previously, while almost half had used oral contraceptive methods.

Non-white women presented a high chance of accepting the ENG-implant (OR 1.27 [Cl 95%: 1.03–1.57, P = 0.01]), while nonstudents presented a acceptance rate of 80.7% including 64.9% of students (OR 1.24 [Cl 95%: 0.97–1.60], P = 0.05). Young women who accepted the ENG-implant were more likely to be unsatisfied/ indifferent with their previous contraceptive method (OR 1.25 [Cl:1.02–1.52], P = 0.02) when compared to those satisfied with their previous method, and a history of unplanned pregnancy was associated with a high prevalence of acceptance when compared to those with planned pregnancy (OR 1.28 [Cl: 0.99–1.67], P = 0.02). The multivariate analyses do not converge, possibly due to interaction between variables, and all of them presented a non-significant prevalence ratio (data not shown).

4 | DISCUSSION

Our study showed a high acceptance rate of the ENG-implant in young women who had just given birth, although this contraceptive method is not offered as routine in the Brazilian public health service due to cost. More than any difference between the young women who accepted or not to use the implant, we would like to highlight the general characteristics of the population studied, which is composed of young women with a mean age of less than 20 years of age, with an unplanned pregnancy, out of the educational system, without a partner and who are non-white. These characteristics are indicators of social vulnerability, which is added to the current early pregnancy and the fact that a quarter of these individuals already have more than one child.

The acceptance of ENG-implant in the postpartum period, before discharge, is still little being explored.¹³ A study involving 127 women found an acceptance rate of 42% for ENG-implant versus non-hormonal methods,¹⁴ a rate lower than the one we found, but the authors included an overweight or obese older population.

When compared with other contraceptive methods, LARCs are highly effective in preventing RRP, particularly when started during the postnatal period.⁴ The immediate postnatal period is the ideal time to start using LARCs, as women who have just given birth are more motivated to uptake contraception.¹⁵ In our sample, most women reported previous use of some contraceptives, however, many were not satisfied with their method. Only one participant had used an IUD, while almost half had used oral contraceptives.

Additionally, women who do not exclusively breastfeed may resume ovulation as soon as 21 days after delivery, and a large proportion (57%) have unprotected sexual intercourse before their 40-day postpartum check-up.¹⁶ The percentage of women who do not attend their postpartum consultation is also high (40%), which often leads to further unplanned pregnancy and RRP.^{17,18} Implant insertion is quick and safe, unlikely to interfere with breastfeeding, and should be an option to all eligible and interested postpartum women.¹⁹

Important influencing factors that increase the rate of young people opting for LARCs are antenatal and postpartum education. Multidisciplinary group guidance held during antenatal care and the postpartum period are important health promotion tools that are easy to apply and do not require high levels of funding.²⁰ Age-appropriate language, images, and graphics are essential for explaining to young

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All authors contributed to the overall study design and specific methodologies. TH, ADS and MMB inserted the ENG-implants. MMB and FGS wrote the first draft. In a meeting, the article was discussed and suggestions from LB and CRTJ were incorporated. All authors contributed to approved of the final version for submission.

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free-choice, which in turn leads to better adherence.²¹ The acceptance rate of ENG-implants among women who had their antenatal care at the study center was high, more than 80%, where educational groups of contraceptive methods are routinely held.

Our study sample showed a positive association for ENGimplant acceptability among non-white women as described previously.²² It has also been suggested that cultural differences between ethnicities could influence the choice of contraceptive methods, however, this relationship has not been proven.²³ The issue of guiding and choosing the method of contraception in relation to vulnerable groups cannot be seen in a simplistic way, and it is important to remember the structural racism that may interfere with the provision of contraceptive methods by healthcare providers.²⁴

Our study has some limitations. The sample was intentional, due to ENG-implants not being offered routinely. Therefore, the difference between the number of women in the two groups—those who accepted the ENG-implant and who did not—may not be representative. It was not possible to perform long-term follow-up of these women due to the restrictions imposed at the hospital during the pandemic.

ENG-implant during the postnatal period generates a high cost. Removing this barrier significantly increases the preference for LARCs, mainly the ENG-implant.²⁵ Family planning remains an essential health activity during the pandemic, especially in Brazil where there are high rates of early pregnancy and a lack of access to contraception. Offering the ENG-implant to young women during the immediate postnatal period is vital for reducing the incidence of unplanned pregnancy and RRP.²⁶ Despite the limited number of implants, we were able to offer an effective method of contraception in a period with many difficulties and restrictions. The wider acceptance of the ENG-implant among young women must be considered and expanded. Further studies are required to assess methods for making the implementation of ENG-implants feasible and routine in the immediate postnatal period. This may be achieved through public policies that value and prioritize female sexual and reproductive health, with reduced costs and greater accessibility.²⁷

Interventions such as those carried out in our study are small and will not have a large-scale impact; however they are a way of pointing out the need to implement measures to improve quality assistance to young women, guaranteeing access to effective contraceptive methods and thereby their right to planned pregnancy.

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CONFLICTS OF INTEREST

LB received an honorarium from MSD as a member of the Board. The other authors do not have any conflicts of interest.

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