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Immediate postabortal contraception with the levonorgestrel intrauterine device, Norplant, and traditional methods☆

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Abstract

Women seeking legal first trimester abortion were counseled concerning contraception methods available for use immediately post-abortion. Fifty women each accepted hormonal methods that were available only in the clinic and were novel to the country, the levonorgestrel IUD and Norplant implants, whereas another 50 chose either coitus interruptus or abstinence. All were experienced contraceptors, but larger percentages of women selecting the levonorgestrel IUD or implants had used the pill or IUDs previously, were under age 30, and weighed less than 60 kg compared to the other study participants. In the initial 2–6 weeks postabortion, women using the long-acting hormonal methods resumed sexual activity earlier and experienced more bleeding and spotting days than did other study participants, but their hematocrits were not adversely affected. No clinically significant side effects were noted in any group in the 6 weeks following the abortion. At the end of 1 year of follow-up, women using the hormonal methods had experienced no pregnancies and had high rates of continuation. IUD and implant participants had greater weight gain than did the other participants, but their mean weight remained below that of participants using traditional methods. No significant between-group differences in levels or changes in levels from admission were noted in hematocrit and blood pressure. The women found the levonorgestrel implants and IUDs easy and safe to use and highly effective. Bleeding disturbances, including amenorrhea, were the principal features the women disliked. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

Family planning (FP) programs have not only greatly increased contraceptive availability during the last four decades, but also have helped increase demand for them. Still, an estimated 46 million women throughout the world, lacking adequate, effective contraception, have induced abortions each year [1]. Similarly, despite a 35-year-old FP program with increased levels of contraceptive use, nearly 300,000 abortions are performed each year in Turkey [2]. Abortion is usually the result of contraceptive method failure or of inadequacies in the FP service [3]. After abortion, both the client and the health care personnel are highly motivated to start contraceptive use. Therefore, postabortal

contraception provides a unique opportunity for couples to be enrolled into FP services. It is crucial to start an effective contraceptive method at the time of abortion because in about half of the women ovulation occurs within 2–3 weeks after first trimester pregnancy termination [4]. In addition, not all women return for postabortal checkup examinations, especially in developing countries where transportation is a problem and people are not in the habit of visiting health facilities when there is no “apparent problem”. Immediate postabortal contraception seems to be acceptable, with 80% [3,5] of women continuing to use their method at the end of 6 months.

Giving the client a wide range of contraceptive choices is one of the cornerstones of quality of care, and effectiveness, in FP services. Another important point is to give clear and correct information about contraceptives, whether adopted postpartum, postabortion, or at other times, and information concerning the likely events that would take place during their use [6]. Therefore, it is essential to have data on the efficacy, safety, and acceptability of the postabortal use of all contraceptive methods. During the last two decades, a

☆ Mirena is the registered trademark of Leiras Pharmaceuticals for the IUD releasing 20 µg/day of levonorgestrel, and Norplant is the registered trademark of the Population Council for capsule implants releasing levonorgestrel.

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number of studies, using mostly immediate postabortal insertion of different copper IUDs, have shown that copper IUDs are safe and effective when inserted at the time of abortion [7–10]. There are fewer studies with OCs [11] and even fewer with Norplant [12] and levonorgestrel (LNG) IUD [13] being started at the time of abortion. We have scant quantitative information on events such as amount and duration of bleeding, spotting, pain, and other side effects and complications that may occur when starting these contraceptives immediately after the abortion procedure [14]. The study presented below represents an attempt to increase our knowledge of the side effects and acceptability of two different long-acting steroidal methods initiated immediately postabortion.

2. Materials and methods

Beginning immediately postabortion, we observed 150 women in a prospective, cohort study. Fifty each decided to use LNG IUD (Levonova, Leiras Pharmaceuticals, Turku, Finland) or Norplant (Wyeth-Ayerst Laboratories, Philadelphia, PA, USA) as their postabortion contraceptive and who had immediate postabortion insertions. The remaining 50 women, who wanted to rely on withdrawal [coitus interruptus (CI)] or to postpone using contraception for a while after the abortion procedure formed a comparison group. The study was conducted at the Woman and Child Health Training and Research Unit of Medical School of Istanbul, where abortion services are provided comprehensively with FP services, annual checkups for women, and well-baby care. At the clinic all women applying for abortion receive pre-abortion counseling, which includes information about the procedure as well as postabortion contraception. Contraceptive devices and funding for the study were provided by the Population Council, New York.

The study was conducted in two stages. A pilot study, from January through June 1995, included a total of 45 women: 15 in each contraceptive arm (LNG IUD, Norplant, and withdrawal or postponement of contraception). This was followed by enrolment in the main study, conducted during April 1996 to June 1997, which included 105

women, 35 in each contraceptive arm. One-year follow-up was concluded in mid-year 1998.

All women presenting with an unwanted pregnancy of 10 weeks (which is the legal cut-off point for voluntary termination of pregnancy) or less had a counseling session during which information about both the procedure and the available contraceptive methods were presented. After women made their choices, they were asked to participate in the study if their choices fit the options available in the study. Standard checklists to exclude women with contraindications such as systemic diseases or genital tract problems, such as pelvic inflammatory disease, since last pregnancy or the existence of uterine fibroids were used for recruitment. All participants who were eligible signed a written informed consent in Turkish. The study was approved both by the local Ethical Committee of the study institution and the Central Ethical Committee of Ministry of Health of Turkey as well as the Institutional Review Board of the Population Council.

Women had the standard abortion procedures offered at the clinic, that is, primarily manual vacuum aspiration under local anesthesia, or occasionally dilatation and evacuation by using an electrical vacuum aspirator. All the procedures were conducted by two of the investigators. The LNG IUDs were inserted just after the evacuation of the uterus, and Norplant implants were placed before the clients left the procedure room, usually within 15 min. Before the participants left the clinic, they were given a standard package, which included four tablets of 500 mg Paracetamol, 10 standard pads for bleeding hygiene, and a menstrual diary. They were told to use the analgesics and pads whenever they needed to. They were advised to buy the same type of analgesics or pads if the ones provided were not sufficient. Antibiotics and uterotonics were rarely prescribed. Women were advised to abstain from vaginal intercourse for 2 weeks. The expected side effects and the signs of possible complications of abortion were explained, and women were told to return immediately to the clinic if any one of them occurred. All the participants were asked to return at 2 weeks, 6 weeks, 6 months, and 1 year after the abortion and at any time they felt a need to consult with medical staff.

At admission and follow-up, physical as well as pelvic

Table 1
Demographic characteristics of study participants (means \pm SD or %)

	LNG IUD	Norplant	Withdrawal/ abstinence	F	p-value
Age	28.8 \pm 5.6	27.9 \pm 5.1	33.7 \pm 6.3	15.10	<0.05
School years	7.0 \pm 3.7	7.3 \pm 4.2	6.4 \pm 4.8	0.36	NS*
Pregnancies	4.4 \pm 2.6	4.0 \pm 1.9	4.9 \pm 2.8	1.63	NS
Deliveries	2.2 \pm 1.4	2.0 \pm 1.2	2.3 \pm 1.4	0.34	NS
Abortions	1.0 \pm 1.4	0.8 \pm 1.1	1.1 \pm 1.6	0.86	NS
12 months since last pregnancy	48%	46%	16%	13.84	<0.05
Wants more children	26%	30%	22%	0.83	NS

* NS: not significant.

Table 2
Contraceptive experience at admission

	LNG IUD (%)	Norplant (%)	Withdrawal/abstinence (%)	F	p-value
Used contraception previous month	82	78	82	0.34	NS*
Experience with oral contraceptive	40	62	16	22.18	<0.05
Experience with IUDs	32	36	25	3.34	NS
Experience with condoms	22	26	14	2.28	NS

** NS: not significant.

examinations were performed. Blood for measuring hematocrit was drawn at admission, 6th week, 6th month and 12th month visits. A Papanicolaou smear was done at admission and at 12th month visit. Menstrual diaries were collected at 2nd and 6th week visits. During the follow-up visits, women/couples who were dissatisfied with their current contraceptive were counseled to switch to other methods. Women who became pregnant or switched to other methods during the course of the study were followed until the end of the 12 months. Women not returning for a visit were considered as lost to follow-up after attempts to encourage a return, including phone calls and home visit by the study nurse, failed. Each woman who terminated use was scheduled for a post-termination visit 6 weeks subsequent to termination to determine the pregnancy status. Implants and IUDs were left in place after the termination of the study if the women wanted to continue, and they were advised to return annually for checkups.

After completion, study forms were sent to the Population Council, Center for Biomedical Research, New York, for data entry and analysis. Data entry was done by using Excel, and data were analyzed with Statistica (StatSoft, Inc, Tulsa, Oklahoma). Chi-square tests, paired t tests, ANOVA, and life table analyses were used, as appropriate.

3. Results

Recruitment of LNG IUD and of Norplant users was completed in 12 and 13 months, respectively, but required 18 months for other participants. All 3 groups of women had similar numbers of pregnancies, children, and abortions; women selecting withdrawal or participants who postponed

contraceptive choice were, on average, more than 5 years older than the implant and IUD participants (Table 1, $p < 0.0001$). Eighty percent of all women said they had practiced contraception during the month they got pregnant (Table 2, $p > 0.05$). The most widely used method during the month of conception was withdrawal (57%), followed by condoms (5%). Contraceptive experience varied by method selected. Women who chose IUDs or implants were two to four times as likely to have had experience with oral contraceptives as were participants who did not select a modern technology after abortion (Table 2, $p < 0.001$). Although the proportions of IUD and implant participants who had earlier experience with IUDs or condoms appeared to be greater than those of women not selecting a modern technology, these differences did not prove to be significant ($p > 0.05$). Physical and pelvic examinations did not show significant between-group differences apart from body weight, which was lower in the (younger) group of women who adopted the new long-acting methods (Table 3, $p < 0.05$). Gestational ages were also similar.

All pregnancies were terminated without complications. Only one woman was prescribed uterotonics; no one required antibiotics. Frequently stated reasons for selecting the LNG IUD were high efficacy (34%) and lighter periods (26%); for Norplant, it was ease of use (20%) followed by fear of side effects of other methods (16%). Women who selected to practice withdrawal or postponed contraceptive choice did so primarily because they said they needed time to think about their choice (32%) or their partner preferred withdrawal (18%).

At the 2nd week visit, women using the LNG IUD reported significantly more days of bleeding, but neither the

Table 3
Physical exam and laboratory tests at admission (mean \pm SD)

	LNG IUD	Norplant	Withdrawal/abstinence	F	p-value
Weight (kg)	62.5 \pm 11.0	59.0 \pm 10.4	64.5 \pm 11.9	3.15	<0.05
Blood pressure					
Systolic (mm Hg)	112.2 \pm 9.7	109.3 \pm 11.2	113.2 \pm 11.8	1.70	NS*
Diastolic (mm Hg)	71.6 \pm 9.2	69.1 \pm 8.1	70.8 \pm 9.2	1.13	NS
Hematocrit (%)	35.9 \pm 4.5	35.9 \pm 4.4	35.3 \pm 4.1	0.38	NS
Gestational age (days)	51.4 \pm 9.8	54.2 \pm 13.2	49.4 \pm 7.1	2.71	NS

* NS: not significant.

Table 4
Experience through the 2nd week visit (mean \pm SD)

Item/Number	LNG IUD	Norplant	Withdrawal/ abstinence	χ^2	p-value
Bleeding days	8.8 \pm 3.7	5.0 \pm 3.2	6.2 \pm 4.6	7.86	<0.05
Spotting days	4.2 \pm 3.4	3.4 \pm 3.2	4.4 \pm 4.5	0.59	NS*
Bleeding and spotting days	13.0 \pm 3.2	8.5 \pm 3.8	10.7 \pm 4.6	10.79	<0.05
Pads used	18.7 \pm 15.2	12.2 \pm 13.8	15.0 \pm 18.7	1.96	NS
Days with pain	3.9 \pm 4.3	2.3 \pm 3.2	3.9 \pm 13.0	0.61	NS
Painkillers	3.7 \pm 5.8	2.7 \pm 2.7	4.2 \pm 13.0	1.51	NS
Acts of intercourse	1.1 \pm 0.3	1.1 \pm 0.2	1.0 \pm 0.2	0.27	NS

* NS: not significant.

number of pads used nor the number of days with spotting were significantly different between the groups (Table 4). Days with pain and the mean number of painkillers used were also similar in all three groups (Table 4). Few women reported fever and/or chills, nausea and/or vomiting, and the proportions did not vary significantly by contraceptive group (not shown). Though advised to abstain from intercourse for 2 weeks, 24% of all study participants reported having intercourse before the end of the 2nd week, with no significant difference among the groups. Six percent had their first intercourse on the 3rd post-procedure day and 17% by the end of first week (data not shown). One woman from each contraceptive group had tenderness during pelvic examination; these participants were prescribed antibiotics and analgesics.

Between the 2nd and 6th weeks, bleeding diminished in all three groups, and the number of days with bleeding did not significantly differ by contraceptive group (Table 5). Women who used LNG IUD or Norplant tended to have more spotting days, a difference that proved significant. As a result, the total number of bleeding or spotting days also proved significantly higher in the groups using IUDs or implants. However, no significant differences in the num-

bers of pads used, days with pain, or numbers of painkillers taken were found. Blood pressure and hematocrit levels were also similar (Table 5). By the 6th week, the great majority of the women in each group had had intercourse. At the 6th week visit, about half or more of women in each group voiced no complaints about their method (48%, 44.9%, 69.4% for LNG IUD, Norplant, and withdrawal/postponement group, respectively). A perception of abdominal distention was the most common complaint (6%) of LNG IUD users, headache (10%) of Norplant users. LNG IUD users stated effectiveness (33%), Norplant and withdrawal users (33% and 24%, respectively) cited safety as their main reason for liking their method.

Norplant and LNG IUD participants had high continuation rates, at 6 months (98 and 94/100, respectively, vs. 72/100 for others) and 12 months (96 and 90/100, respectively, vs. 59/100 for others; $p < 0.01$). There were no pregnancies in either group of women using the long-acting contraceptives, but there were three pregnancies in the first year among other women, a rate of 8/100. The main reason for discontinuing the LNG IUD was expulsion, partial and complete (two cases). Two women discontinued Norplant use in the first year because of bleeding problems. Personal

Table 5
Sixth week visit

Item/Number	LNG IUD	Norplant	Withdrawal/ abstinence	F	p-value
Bleeding days	5.0 \pm 5.0	6.3 \pm 5.7	5.7 \pm 6.7	0.44	NS*
Spotting days	6.8 \pm 5.2	5.7 \pm 6.6	2.5 \pm 3.2	5.24	<0.05
Bleeding and spotting days	11.8 \pm 6.1	12.0 \pm 7.7	8.2 \pm 7.5	2.69	NS
Pads used	6.8 \pm 7.0	9.3 \pm 9.1	9.9 \pm 9.9	1.50	NS
Painful days	1.5 \pm 3.1	1.1 \pm 3.2	0.6 \pm 1.5	1.37	NS
Painkillers	0.4 \pm 1.1	0.3 \pm 1.3	0.6 \pm 1.6	0.41	NS
Had intercourse (%)	91.7	93.8	89.4	² =0.60	NS
Acts of intercourse	1.9 \pm 0.4	1.9 \pm 0.3	1.8 \pm 0.4	0.52	NS
Days to sex	16.4 \pm 5.7	16.3 \pm 5.4	20.3 \pm 10.0	3.95	<0.05
Hematocrit (%)	37.4 \pm 5.0	37.1 \pm 4.8	36.6 \pm 4.2	0.28	NS
Change in hematocrit (%)	1.2 \pm 4.2	1.0 \pm 3.8	1.7 \pm 4.3	0.31	NS
Blood pressure					
Systolic (mm Hg)	111.0 \pm 9.9	111.9 \pm 10.2	111.9 \pm 9.4	0.11	NS
Diastolic (mm Hg)	69.9 \pm 8.4	69.1 \pm 7.6	71.3 \pm 8.8	0.90	NS

* NS: not significant.

Table 6
Mean changes from baseline to 1 year

	LNG IUD	Norplant	Withdrawal/ abstinence	F	p-value
Weight (kg)					
Level	65.0 ± 11.4	62.2 ± 10.2	67.4 ± 9.5	2.09	NS*
Change	2.6 ± 3.6	2.5 ± 3.5	0.4 ± 3.0	4.11	<0.05
Systolic PG (mm Hg)					
Level	109.5 ± 11.7	112.1 ± 11.7	112.9 ± 12.4	0.80	NS
Change	-2.6 ± 12.1	2.8 ± 14.3	-1.4 ± 14.1	1.91	NS
Diastolic BP (mm Hg)					
Level	67.9 ± 8.71	69.3 ± 8.7	69.6 ± 9.99	0.42	NS
Change	-3.4 ± 9.1	0.1 ± 9.2	-2.1 ± 12.0	1.42	NS
Hematocrit (%)					
Level	39.1 ± 3.2	38.9 ± 3.2	39.2 ± 3.3	0.07	NS
Change	3.2 ± 4.5	2.7 ± 4.7	3.0 ± 4.6	0.12	NS

* NS: not significant; BP: blood pressure.

reasons, followed by pregnancy, dominated the reasons for discontinuation among the participants in the third arm of the study. A large number of the "personal" reasons appeared to be the desire to change to a more effective or suitable method of contraception. High continuation rates of the two hormonal methods persisted after the study was completed; 61.3% for LNG IUD and 60.8% for Norplant users versus 34.1% for traditional method users at 36 months.

One year after the procedure, levels and changes in blood pressure and hematocrit levels were similar in the three contraceptive groups (Table 6). Women using the hormonal methods had gained more weight than did the CI group (Table 6, $p < 0.05$), but their mean weight remained somewhat below, although not significantly different from, the mean weight of the third contraceptive group who were older (Table 6).

3.1. Satisfaction with the methods

At their last contact with the clinic in the year following the abortion, participants were asked open-end questions as to what they liked most and disliked most about the method they had been using since the abortion. For this analysis, the comparison participants were limited to the group who were practicing CI. We found, for both likes and dislikes, the views of the IUD and implant groups were statistically similar, but as would be expected, markedly different from the attitudes and perceptions of the withdrawal group (Tables 7 and 8, $p < 0.001$). The prime attributes of the IUD that were liked were that it was safe and associated with reduced bleeding. Furthermore, participants found this IUD to be easy to use, and they deemed it effective. The implants were seen as easy to use as well as safe and effective. Only a small percentage found nothing to like in the IUD or implants. CI was seen as safe, easy to use, and clean, but more women (15%) found nothing to like about it (Table 7).

Approximately half of the women using the LNG IUD and half using withdrawal found nothing to dislike about the method, while one third of the Norplant participants re-

ported this. An equal proportion of the Norplant participants, however, expressed a dislike for the bleeding and spotting experienced during method use (Table 8). Twenty percent of the IUD participants also expressed this dislike, and an additional 9% said they disliked the amenorrhea and/or infrequent bleeding experienced while using the IUD. Dislike of side effects experienced or of possible side effects was expressed by 23% and 13% of Norplant and IUD participants, respectively. More than 30% of the women whose contraceptive method was withdrawal expressed doubts about the effectiveness and hence the safety of withdrawal (Table 8); this was their chief dislike or concern.

4. Discussion

At the time of abortion, women are highly motivated to start an effective method of contraception [3], and they are inclined to discontinue their previous method, which has

Table 7
Features participants liked best: percentage distribution

Feature liked best	LNG IUD (%)	Norplant (%)	Withdrawal/ abstinence
Nothing liked	4	6	15
Not sure what liked	2	4	0
Partner liked	4	4	4
Easy to use	17	38	22
Clean	2	0	19
Coitus independent	4	2	0
Safe	20	13	22
Effective	15	13	7
Reduced bleeding	20	9	0
Painless	7	2	0
Other	5	9	11
Total	100	100	100
n	46	47	27

$p = 0.443$, IUD vs implant.

$p < 0.0001$, IUD vs. implant vs. coitus interruptus.

5

Table 8
Features participants disliked most: percentage distribution

Feature	LNG IUD	Norplant	Withdrawal/ abstinence
Nothing disliked	53	34	50
Not effective, not safe	2	0	31
Partner did not like	0	2	8
Bleeding, spotting	20	34	0
Amenorrhea or infrequent bleeding	9	2	0
Breast tenderness	2	0	4
(Fear of) side effects	13	23	8
Not sure	0	4	0
Total	100	100	100
n	45	47	26

$p = 0.108$, IUD vs implant.

$p < 0.0001$, IUD vs implant vs coitus interruptus.

failed, and adopt a more effective method [5]. In concordance with this, we observed high initial acceptance rates both for LNG IUD (nearly 10% of all abortion clients and 20% of IUD acceptors chose the LNG IUD) and Norplant (nearly 5% of all new method acceptors) [15], although neither method was registered in Turkey, both were relatively unheard of and unfamiliar, and the study selection criteria and follow-up requirements of the study restricted their acceptance. Interestingly, women who had (probably negative) experience with other modern methods before tended to choose implants, but women who had tried pills but not IUDs tended to select an LNG IUD. In addition to this high initial acceptance, both new methods had very high continuation rates and no failures, whereas the failure rate of withdrawal was high and led to new abortions.

The LNG IUD, being a foreign body, caused longer bleeding in the postabortion period, but this did not cause a significant increase in the number of pads used or a decrease in hematocrit. Changes in hematocrit measurement of approximately 3% were similar for all three groups during the entire study period (Table 6). In the long run, the only negative change that was found to be related to the hormonal methods was weight gain, but the participants remained, on average, below the weight of the participants not using hormonal methods, and there were no terminations because of weight gain. Most of the acceptors of hormonal methods were satisfied with their method, finding them easy to use, safe, and effective, and in the case of the LNG IUD, appreciating the reduced bleeding associated with the device. Continuation rates for these two methods were quite high both at 1 year and in the longer run [15], whereas the lower continuation rate found among women using CI reflects both an elevated pregnancy rate and an abandonment of the method in fear of experiencing unintended pregnancy again while practicing the method.

Although conducted in a relatively small group of acceptors, this study shows that both the LNG IUD and Norplant might have high acceptability as postabortion contraceptives with few failures. The ability to initiate use of these

methods at the time of abortion without serious health risks and major side effects adds to their values as postabortion contraceptives, especially in developing country settings or wherever transportation is a problem for the clients. One must keep in mind, however, that both these methods are expensive and cost-effectiveness analysis may be necessary to persuade decision makers to make them widely available.

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