The levonorgestrel intra-uterine system: Therapeutic application in family planning

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Summary

Objective. *To assess the non-contraceptive benefits of the levonorgestrel intra-uterine system 12 months following insertion in a family planning setting.*

Design. *Postal questionnaire survey.*

Setting. *Family planning clinics at the Ulster and Bangor Hospitals.*

Subjects. *Eighty-six consecutive subjects fitted with the levonorgestrel intra-uterine system.*

Results. *Response rate 87.3%. Outcome measured in terms of compliance, satisfaction and menstrual symptomatology. Reasons for insertion were as follows: 21.7% contraception only; 65.2% menorrhagia, 24.6% dysmenorrhoea and 1.4% premenstrual syndrome. Duration of menses was 8.25 days pre-insertion and 2.41 days at 12 months. Of the subjects, 59.4% experienced at least one hormonal side effect; 10.1% of systems were removed within 12 months. At 12 months 86.9% of women were satisfied and 9.8% of women planned to discontinue.*

Conclusion. *The levonorgestrel intra-uterine system was acceptable to almost 80% of women after 12 months, with significant reduction in duration of menses. Family planning clinics are an ideal setting to implement the guidelines for the initial management of menorrhagia.*

Key words

benefits, compliance, family planning clinic, levonorgestrel intra-uterine system, LNG-IUS, menstrual symptomatology, satisfaction

Key message points

- This survey was conducted to establish whether the non-contraceptive benefits of the LNG-IUS on menstrual function could be achieved in local family planning clinics.
- Patient outcome was measured in terms of compliance, satisfaction and menstrual symptomatology 1 year following insertion of the LNG-IUS.
- The levonorgestrel intra-uterine system was acceptable to almost 80% of women after 12 months, with significant reduction in duration of menses.
- Family planning clinics are an ideal setting to implement the guidelines for the initial management of menorrhagia.

Introduction

The levonorgestrel intra-uterine system (Mirena^{R} LNG-IUS) was first licensed for contraceptive use in the UK in May 1995. It's convenience, combined with annual pregnancy rates of 0.16 per 100 women-years[1] and rapid reversibility of action[2] makes it an ideal contraceptive. More recently the additional non-contraceptive benefits have been highlighted by the RCOG in the Guidelines for the Initial Management of Menorrhagia. Yet, despite the apparent clinical benefits, Murty et al found that cost and supply influenced clinical practice when introducing it into a UK family planning service.[3] This has also been the experience in the Northern Ireland region, where the supply to hospital family planning clinics has been limited and there has been reluctance by some general practitioners (GPs) to supply the system given the high initial cost and uncertainty about its suitability.

This survey was undertaken to establish whether the non-contraceptive benefits of the LNG-IUS on menstrual function could be achieved in local family planning clinics. Patient outcome was measured in terms of compliance, satisfaction and menstrual symptomatology after 1 year following insertion of the LNG-IUS.

Method

All subjects were recruited from two hospital family planning clinics organised by the Ulster Community and Hospitals Trust. Subjects considered to be suitable for the LNG-IUS had counselling and then returned for a second visit at the next period to have the system fitted. Supplies were obtained from family planning stocks or from the chemist if the GP had supplied a prescription.

A standard technique was used and all women received mefenamic acid 500 mg on the night and morning prior to insertion. Instillagel was applied to both the endocervical canal and anterior cervical lip prior to insertion.

A pilot questionnaire of explanation and SAE for return was posted to 12 subjects to assess the design of the questionnaire. Postal questionnaires with a covering letter of explanation and SAE for return were sent to 86 consecutive subjects in the main survey. Four weeks later non-respondents were contacted by telephone and a second questionnaire with covering letter and SAE for return was posted. The questionnaire comprised questions on age, parity, previous contraception, reason for insertion of LNG-IUS, iron supplementation, pain on insertion, menstrual function, side effects, satisfaction, future pregnancies and future contraception. Non-respondents and respondents were compared with respect to age. Validation of the questionnaire was carried out by reviewing the clinical charts of 15 subjects and comparing the postal questionnaire responses with those documented at the time of family planning review at three and 12 months following insertion.

To ensure confidentiality, data were transferred to computer using numerical coding and analysis was carried out using the Statistical Package for the Social Services (SPSS). Statistical analysis was carried out using an independent sample 't' test and Mann Whitney U tests for statistical significance, $p < 0.05$ denoting statistical significance.

Results

The pilot response rate was 66.7% (8/12) following one posting. Questionnaires were well completed with no changes to the format required.

Eighty-six subjects were included in the first posting of the main survey. Seven of these subjects were ineligible as questionnaires were returned marked 'wrong address' and these patients were lost to follow-up. The overall response rate following two postings in the main survey was 87.3% (69/79). The age range of the subjects was 25-51 years, and mean parity was 2.54 (range 0-5). One subject had a previous history of miscarriage. Respondents and non-respondents showed no significant difference in age using Fisher's Exact Test $X^2 = 2.84$, p = 0.06.

All the women (100%; 69/69) requested reliable contraception. Table 1 illustrates the reasons for insertion of the LNG-IUS: 21.7% (15/69) contraception only, 65.2% (45/69) menorrhagia, 24.6% (17/69) dysmenorrhoea, 1.4% (1/69) pre-menstrual syndrome.

Table 1 *Reason for LNG-IUS insertion*

Reason for insertion*	Number+	Percentage (%)
Contraception only	15	21.7
Menorrhagia	45	65.2
Dysmenorrhoea	17	24.6
Pre-menstrual syndrome	1	1.4

* 100% requested reliable contraception
+ Total 69 women

With respect to family, 76.8% (53/69) declared their family complete; 10.1% (7/69) declared their family not complete and 13.0% (9/69) declared unsure.

Of the subjects, 44.9% (31/69) had an existing copper device; 34.8% (24/69) had not previously used an IUD.

Table 2 illustrates menstrual outcome using an independent sample 't' test for statistical analysis. The pre-insertion mean duration of menses was 8.25 (95% CI 6.93-9.57 days), which was reduced to 4.00 days (95% CI 2.66-5.34) at 3 months (p = 0.000), and to 2.41 days (95% CI 0-4.82) at 12 months (p = 0.000). The median duration of inter-menstrual spotting was 0.95 days (95% CI 0.52-0.94) prior to insertion; 2.19 days (95% CI 1.03-3.35) at 3 months (p = 0.049), and 1.84 (95% CI 0.7-2.98) at 12 months (p = 0.223). At 12 months 24.6% (15/61) of subjects had amenorrhoea.

Table 2 *Menstrual outcome*

Time	Menses (days)*	Inter-menstrual bleeding (days)*	Pads/tampons*
Pre-insertion	8.25	0.95	28.35
3 months	4.0 (p = 0.000)	2.19 (p = 0.049)	12.31 (p = 0.000)
12 months	2.41 (p = 0.000)	1.84 (p = 0.223)	5.02 (p = 0.000)

* Analysis: an independent samples 't' test, using a one tailed test.

The pre-insertion mean number of pads/tampons was 28.35 (95% CI 18.71-37.99), which fell to 12.31 (95% CI 5.89-18.73) at 3 months (p = 0.000) and to 5.02 (95% CI 2.38-7.40) at 12 months (p = 0.000).

Prior to LNG-IUS insertion, 20.2% (14/69) of subjects were taking oral supplements for heavy periods and 15.9% (11/69) had taken time off work during their period.

Table 3 illustrates the side effects experienced. It can be seen that 59.4% (41/69) had at least one hormonal side effect and that the side-effects were as follows: breast tenderness 57.9% (40/69); mood changes 39.1% (27/69); backache 34.8% (24/69); acne 17.4% (12/69); others 18.8% (13/69); inter-menstrual spotting > 4 days at 12 months 6.6% (4/61). On multivariate analysis mood changes were the only side effect to be associated with non-satisfaction (Mann-Whitney U two tailed test U=369.5 W = 694.500 p = 0.033).

Table 3 *Side effects*

Side effect	Number+	Percentage (%)
Breast tenderness	40	57.9
Mood swings	27	39.1
Headaches	24	34.8
Acne	12	17.4
Inter-menstrual bleeding	4	6.6
Other	13	18.8

+ Total 69 women

Table 4 illustrates patient satisfaction and shows that 86.9% (53/61) of women were satisfied/very satisfied at 1 year. Within the first 12 months 10.1% (8/69) of systems were removed. Reasons for removal were: coil expulsion (n = 2); acne (n = 2); headaches (n = 1); heavy bleeding (n = 2); sterilisation (n = 1). Of the subjects, 9.84% (6/61) planned to discontinue after 1 year. Four of these women had inter-menstrual spotting > 4 days duration and one woman had amenorrhoea.

Table 4 *Subject satisfaction with the LNG-IUS*

	Number*	Percentage (%)
Very satisfied	42	68.9
Satisfied	11	18.0
Not satisfied	7	11.5
Unsure	1	1.6

* Total number 61

Discussion

This review of the therapeutic application of the LNG-IUS to a UK family planning setting demonstrates that at 1 year 89.9% of women were compliant and 6.25% of women required removal of the system for either hormonal reasons or continued heavy bleeding within the first year. Removal rates for hormonal reasons have been reported as 2.3 per 100 LNG-IUS users compared with 0.1 for Nova-T users after 1 year.[4] In this survey numbers were much smaller than in both of these studies and this may have accounted for the apparently higher removal rates. Whilst we observed that the majority of women experienced transient hormonal side effects and that these were usually multiple, acne and headaches were the only two side effects reported which led to removal of the LNG-IUS. This finding is consistent with that reported by Sivin and Stern[1] who found significantly higher rates of removal in women who experienced either headaches or acne. Women may find these two side effects unacceptable even in the short-term, whilst careful pre-insertion counselling is likely to have ensured that almost 90% of women were still compliant 1 year even when other side effects were common.

In this survey 65.2% of women complained of heavy periods. Chimbira et al[5] have previously noted that only 40% of women complaining of menorrhagia have a > 80 mls blood loss per cycle when it is objectively measured. We did not objectively measure menstrual blood

loss, but quantified loss by the number of sanitary pads and the duration of menstrual bleeding as these are clinical means that often determine whether treatment is initiated. At both three and 12 months blood loss was significantly reduced in terms of both the number of bleeding days and the need for sanitary pads. However, 4.4% of women with heavy periods continued to bleed heavily and required the LNG-IUS to be removed within 1 year. Irvine et al[6] have reported a reduction in bleeding at 3 months of 94%; Tang and Lo[7] reported a 95% reduction at 6 months and Andersson and Rybo[8] reported a 97% reduction at 12 months. In each of these three studies the LNG-IUS was used in cases of objectively proven menorrhagia. Improved quality of life was reported in our survey: women who had previously required iron supplementation or who had taken time off work were no longer doing so at 12 months. Women with inter-menstrual bleeding did not request removal of the LNG-IUS within the first 12 months. However, at 12 months all four women who still experienced inter-menstrual bleeding of more than 4 days duration in each cycle planned to discontinue use at this time.

Amenorrhoea at 1 year was reported by almost 25% of women, but only one of these women planned to discontinue use. Termination rates due to amenorrhoea are very variable. Andersson et al[2] reported a termination rate of 1.5 per 100 years because of amenorrhoea at the end of the first year when comparing the Nova-T IUD and the LNG-IUS; 11.6 per 100 was reported by Luukkainen et al[9] at 5 years and 4.4 per 100 years by Sivin and Stern.[1] Low discontinuation due to amenorrhoea in our survey may have reflected the lifestyle improvement for those women who had previously complained of heavy periods, and counselling prior to insertion may have provided the reassurance that amenorrhoea did not signify pregnancy.

This survey demonstrated that 86.9% of women were either satisfied or very satisfied after 1 year. Whilst the LNG-IUS is as yet unlicensed for menorrhagia in the UK, it may be prescribed on a named-patient basis for this purpose and it has been included as an RCOG Category A recommendation in the initial management of menorrhagia. We have illustrated the acceptability of the LNG-IUS both in terms of patient compliance and improvement in menstrual symptoms when used in a family planning clinic in accordance with the recent RCOG guidelines.

Conclusion

Family planning doctors are in an ideal situation to implement the RCOG Guidelines for the initial management of menorrhagia, given their experience in both pelvic assessment and insertion of IUCDs. The overall acceptability of the LNG-IUS to the community surveyed may encourage GPs to provide funding and thus improve supply, and some may also consider directly referring patients with menorrhagia to the family planning clinic for fitting of a LNG-IUS when clinically indicated.

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References

1 Sivin I, Stern J. Health during prolonged use of levonorgestrel 20 µg/d and Copper Tcu 380Ag intrauterine contraceptive devices: a multicentre study. *Fertility and Sterility* 1994; **61 (1)**: 70–77.

2 Andersson K, Batar I, Rybo G. Return to fertility after removal of a levonorgestrel releasing intrauterine device and Nova-T. *Contraception* 1992; **46**: 575–584.

3 Murty J, Barron A, Searle E. Auditing the introduction of a new product to a family planning service. *Br J Family Planning* 1998; **24**: 24–25.

4 Andersson K, Odlind V, Rybo G. Levonorgestrel-releasing and copper releasing (Nova T) IUDs during five years of use: A randomised comparative trial. *Contraception* 1994; **49**: 56–72.

5 Chimbira TH, Anderson AB, Turnbull AC. Relation between measured menstrual blood loss and patient's subjective assessment of loss, duration of bleeding, number of sanitary towels used, uterine weight and endometrial surface area. *Br J Obstet Gynaecol* 1980; **87**: 603–609.

6 Irvine GA, Campbell-Brown MB, Lumsden MA, et al. Randomised comparative trial of levonorgestrel intrauterine system and norethisterone for treatment of idiopathic menorrhagia. *Br J Obstet Gynaecol* 1998; **105(6)**: 592–598.

7 Tang GW, Lo SS. Levonorgestrel intrauterine device in the treatment of menorrhagia in Chinese women: efficacy versus acceptability. *Contraception* 1995; **51**: 231–235.

8 Andersson JK, Rybo G. Levonorgestrel-releasing intrauterine device in the treatment of menorrhagia. *Br J Obstet Gynaecol* 1990: **97**; 690–699.

9 Luukkainen MD, Allonen H, Haukamaa M, et al. Five years experience with Levonorgestrel-releasing IUDs. *Contraception* 1986; **33 (2)**: 139–148.