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ORIGINAL RESEARCH ARTICLE

Pain during medical abortion in early pregnancy in teenage and adult women

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Abstract

Introduction: Women experience pain during medical abortion, yet optimal pain management remains unclear. We studied the pain experience and need of analgesics during early medical abortion (≤63 days of gestation) among teenage and adult women. We also assessed predictive factors of severe pain.

Material and methods: We recruited 140 primigravid women: 60 teenagers and 80 adult women aged between 25 and 35 years old. The group of teenagers included 19 women under the age of 18 years old (minors). The abortion was performed with mifepristone (200 mg) followed by vaginal misoprostol (800 μg), mainly self-administered at home for adults. Minors were hospitalized during misoprostol administration. Pain medication consisted of ibuprofen 600 mg and paracetamol 1000 mg, first doses taken simultaneously with misoprostol and repeated, if needed, up to three times daily. Additional opiates (mainly tramadol or oxycodone) were administered at hospital if needed. Pain was measured using the visual analogue scale (VAS, 0-100 mm).

Results: The maximal pain VAS (median, interquartile range) was 75 (54-91). Of all the women, 57.7% experienced severe pain (VAS ≥70) during abortion care and 93.5% of women needed additional analgesics in addition to prophylactic pain medication. Teenagers needed additional analgesics more often than adults (5 [3-8] vs 3 [2-6] times, $P = .021$); 38.0% of all teenagers (64.7% of the minors) received additional opiates compared with 7.9% in adult women. Severe pain (VAS ≥70) was associated with history of dysmenorrhea (adjusted odds ratio [OR] 2.60 [95% confidence interval [CI] 1.21-5.59, $P = .014$]), anxiety at baseline (2.64 [1.03-6.77], $P = .044$) and emesis during abortion (5.24 [2.38-11.57], $P < .001$). Hospital administration of misoprostol did not lower the risk for severe pain experience (OR 0.84 [95% CI 0.34-2.05], $P = .694$). Satisfaction with care was high in study population (median VAS 91 [interquartile range 79-97]) and was not associated with the use of narcotic analgesic or place of misoprostol administration.

Abbreviations: CI, confidence interval; GHQ, General Health Questionnaire; OR, odds ratio; RCOG, Royal College of Obstetricians and Gynaecologists; VAS, visual analogue scale; WHO, World Health Organization.

Conclusions: Pain intensity was high both in teenage and adult women undergoing medical abortion, yet satisfaction on care was high. More effective analgesics than ibuprofen and paracetamol should be offered to all women undergoing early medical abortion, especially to those with history of dysmenorrhea. Also, routine use of antiemetics might be advisable.

KEYWORDS

first-trimester abortion, induced abortion, medical abortion, pain, teenager

1 | INTRODUCTION

Abortion methods have rapidly changed from surgical to medical in several countries. In 2017, the medical method by means of mifepristone followed by misoprostol was used in 75%-97% of all abortions in the Nordic countries and in Scotland.[1,2] Moreover, medical abortion is as effective and safe for adolescents as for adult women.[3]

Most patients undergoing medical abortion experience abdominal pain and, in every fourth woman, even severe pain.[3-7] Predictive factors for severe pain include young age, nulligravidity, advanced gestational age, anxiety and history of dysmenorrhea.[4-6,8,9] However, little is known on pain experience among teenage women undergoing medical abortion. A history of abortion might also be a risk factor for severe pain, even if it has no effect on the need for analgesics.[9,10] Still, fear of pain might be one reason women prefer surgical abortion over the medical one.[11,12]

The overall need for analgesics during medical abortion in early pregnancy has been reported to vary between 68 and 91%, and 2-29% of women need additional narcotic analgesics.[5,7,13,14] Nonsteroidal anti-inflammatory drugs are widely used and they do not decrease the efficacy of medical abortion.[10,15,16] Ibuprofen and paracetamol both decrease the pain score during early medical abortion, ibuprofen being more effective.[10] Furthermore, prophylactic administration of nonsteroidal anti-inflammatory drugs reduces the need for additional pain medication and opiates.[15-17] Yet, regular use of ibuprofen during medical abortion only increases the number of tablets used without any effect on the pain experience.[4,15,17]

Pain and the use of analgesics are often poorly reported in studies on medical abortion and variation of medical methods makes the comparison of pain experience difficult.[18,19] Though pain is a known adverse effect of medical abortion, guidelines on pain management are limited. The World Health Organization (WHO), the International Federation of Gynecology and Obstetrics (FIGO), the American College of Obstetricians and Gynecologists (ACOG), and the Royal College of Obstetricians and Gynaecologists (RCOG) recommend that women undergoing medical abortion should be routinely offered analgesics but only the use of nonsteroidal anti-inflammatory drugs is mentioned.[20-23] A recent survey showed that there is a large variation in the analgesics used among abortion providers.[24]

Key message

More than half of women experience severe pain during medical abortion. Severe pain was associated with history of dysmenorrhea, anxiety at baseline and emesis during abortion. Prophylactic use of ibuprofein and paracetamol alone is not adequate for pain management.

In this prospective study, we assessed the pain experience, the need for analgesics, and adequacy of the combination of ibuprofen and paracetamol during medical abortion in early pregnancy. All these factors were evaluated among teenage and adult women. Also, we studied the predictive factors of severe pain and the need for additional pain medication, and assessed the acceptability of medical abortion and patient satisfaction in relation to pain experienced in the study cohort.

2 | MATERIAL AND METHODS

This prospective study was conducted at the Department of Obstetrics and Gynecology of the Helsinki University Hospital between 7 March 2016 and 31 August 2018. Women requesting early medical abortion (up to 63 days of amenorrhea) were invited to participate in the study. The inclusion criteria were age between 15-19 or 25-35 years, first singleton pregnancy, and no allergy for analgesics used in the study. Women seeking abortion due to fetal abnormalities or maternal health conditions were excluded, as were women with a history of opioid addiction. Women volunteering for the study received written and verbal information on the study and signed an informed consent form. All women attending a follow-up were included in the analysis. Furthermore, we made analysis of minors (aged 16-17 years) and late teens (aged 18-19 years) separately for some of the results.

Medical abortion was carried out according to the Finnish national guideline as follows: mifepristone (200 mg) was administered orally at the outpatient clinic (day 1) followed by misoprostol (0.8 mg) administered vaginally (or orally in cases of heavy bleeding) at 48-72 hours later (day 3 or 4). Patients ≥18 years old primarily

self-administered misoprostol at home. Minors (<18 years old) were managed for the first 4-6 hours after misoprostol administration at the outpatient clinic according to local guidelines.

Clinical examination and determination of the duration and status of the pregnancy by vaginal ultrasound were performed at the outpatient clinic. Women participating in the study filled out a questionnaire, including background information and standardized questionnaire on anxiety and depression [General Health Questionnaire 12 (GHQ–12)]. We used GHQ scoring and a threshold limit of 6/12 as indicator of anxiety when analyzing the GHQ–12 questionnaire.[25]

Abortion-related pain was recorded in a paper diary in which women were asked to estimate the intensity of pain and emesis every time additional analgesics were needed and to record the use of analgesics. Follow-up visits were scheduled in 2-4 weeks, during which the outcome of abortion was verified by means of ultrasound, and women completed questionnaires on satisfaction, memory of pain, adequacy of the analgesics used, and willingness to choose medical abortion again if needed.

Intensity of pain, emesis during the current pregnancy and patient satisfaction were measured using a 0- to 100-mm visual analogue scale (VAS), where patients mark the point on a 100 mm line, which describes best the intensity of her pain, emesis, or satisfaction (0 meaning no pain or emesis, and 100 as the worst imaginable pain or emesis). Regarding the intensity of pain, VAS 0-40 was considered mild or tolerable pain, and VAS ≥70 severe pain.[26] We assumed that pain was tolerable (VAS ≤40) among women who returned an empty pain diary due to no need for additional pain medication. Reported use of pain medication during menses was used as an indicator of history of dysmenorrhea.

Analgesics used in this study were 600 mg of ibuprofen and 1000 mg of paracetamol (acetaminophen), both administered orally. This is according to local practice. First, prophylactic doses of both analgesics were to be taken simultaneously with misoprostol and repeated later whenever needed, both up to three times daily. All patients were provided with 10 tablets of both analgesics, but not narcotic analgesics for home use. Narcotic analgesics were mainly given at hospital outpatient clinic if needed. Administration route and doses (oral or intramuscular) were decided case by case at hospital, and opiates used were tramadol or oxycodone. None of women was provided narcotics for home use by the investigators.

The main outcome measures were pain during medical abortion and the need for analgesics. Secondary outcome measures were emesis and satisfaction with the treatment. We determined the need for analgesic by counting times and types of analgesics taken during medical abortion. We assessed predictive factors for severe pain experience.

2.1 | Statistical analyses

Sample size was that of convenience and was based on the expected number of induced abortions among teenage women over 1 year. It was assumed that half of all women eligible for the study would be willing to participate. Therefore, the aim was to recruit at least 60 teenagers and a similar group of adults as a reference group.

We used IBM SPSS version 25 for Mac (IBM Corp.) for analyses. Comparisons were performed using nonparametric tests, Pearson's chi-squared test, and Mann-Whitney *U* test as appropriate. We used logistic regression for calculating odds ratios. All statistical tests were two-tailed. A *P*-value <.05 was considered to be statistically significant.

2.2 | Ethical approval

We obtained an approval from the ethics committee of Hospital system of Helsinki and Uusimaa (HUS320/13/03/03/2015) as well as from the Finnish Medical Agency. The EudraCT registration number of the study is 2015-005657-12, and that of www.clinicaltrials.gov registration is NCT02678897.

3 | RESULTS

A total of 140 women were recruited. Altogether, eight (5.7%) women failed to attend the follow-up visit and were excluded from the analysis (Figure 1). In all, 132 women (56 teenagers [19 minors] and 76 adult women) were included in the analysis. Data

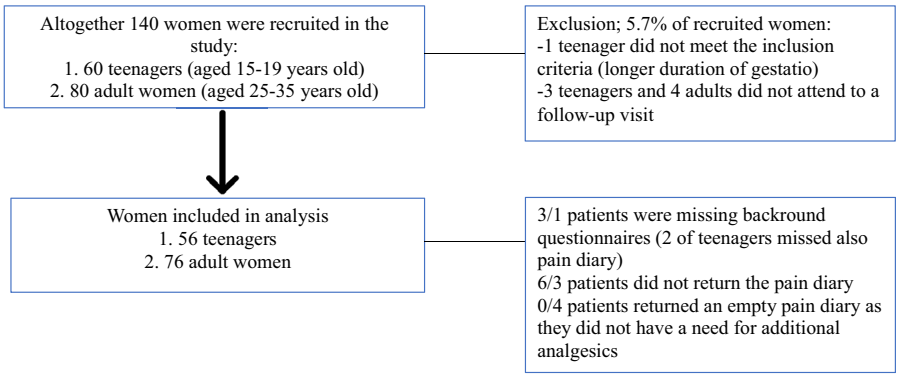

FIGURE 1 Study flow [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 1 Descriptive data of all women comparing teenagers and adult women. Results are median (IQR) unless stated otherwise

	All women n = 132	Teenagers n = 56	Adult women n = 76	*P* value
Age (years)	26 (19-29)	19 (17-19)	28 (27-31)	<.001
BMI (kg/m^2)[a]	22 (21-24)	22 (20-25)	22 (21-24)	.335
Duration of gestation (days)	48 (44-54)	50 (45-57)	48 (44-53)	.074
Reported ovulation pain (VAS)[b]	8 (0-31)	11 (1-38)	6 (0-30)	.301
Reported menstrual pain (VAS)[b]	36 (11-64)	40 (14-63)	33 (10-64)	.679
Emesis in the current pregnancy (VAS)[b]	32 (8-61)	42 (14-69)	26 (0-58)	.089
Anxiety at the time of abortion (GHQ-12)[c]	3 (1-6)	3 (1-6)	3 (1-7)	.473
Proportion of women having GHQ score ≥6, n (%)	31 (26.5)	13 (26.0)	18 (26.9)	.916

[a]Data on weight are missing from three teenagers and eight adult women.

[b]Background questionnaires missing from three teenagers and one adult woman.

[c]Anxiety questionnaire was missing or empty in six teenagers and nine adult women.

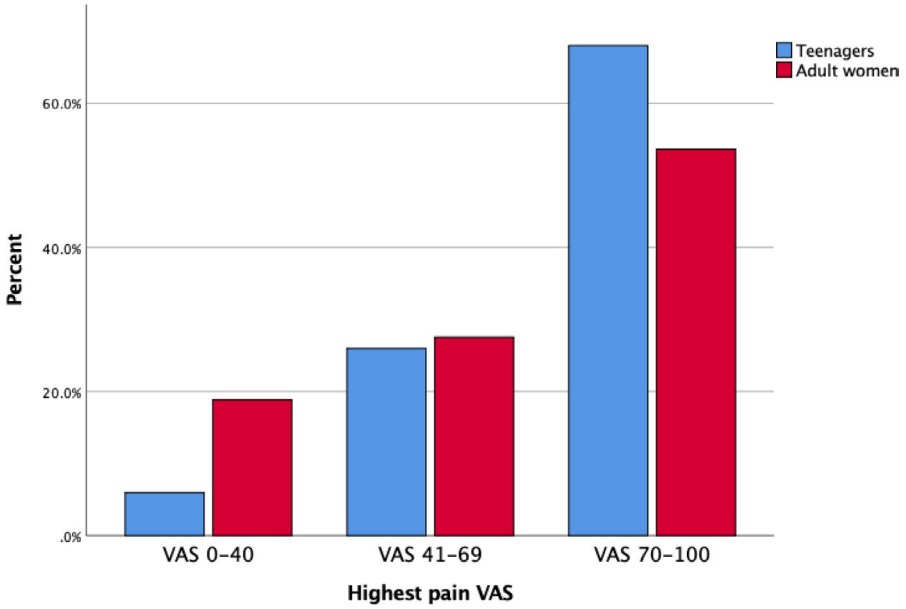

FIGURE 2 Proportions of women experiencing different categories of pain [Color figure can be viewed at wileyonlinelibrary.com]

were partly missing for seven (12.5%) teenagers and four (5.3%) adults. However, there was no difference in the background characteristics between the women replying to all questionnaires and those with some missing data. Thus, the incidence of missing data was assumed to be random and these women were included in the final analyses.

The teenage and adult women were similar in many aspects (Table 1). Teenagers smoked more often (47.3% vs 30.3%, *P* = .047) and were more often in a relationship than adult women were (87.8% vs 50.7%, *P* < .001). Altogether, 60.3% of all women reported analgesic use for menstrual pain, the proportion being similar among teenagers and adult women (67.3% vs 55.4%, *P* = .179). The proportion of women with a history of psychiatric diagnoses was indistinguishable between the two cohorts (teenagers 8.9% vs adults 9.2%, *P* = .956).

The maximal pain VAS during abortion (median, interquartile range) was 75 (54-91) in the study population and was similar in both subgroups (teenagers 79 [63-93] and adults 73 [50-90], *P* = .107). Moreover 57.7% of all women experienced severe pain (VAS ≥70) during abortion care (Figure 2). Only 13.8% of all women reported pain as tolerable during abortion (VAS <40). The most intensive pain was reported at 2.3 (1.1-5.0) and 3.4 (1.1-6.0) hours after misoprostol administration (*P* = .451) in teenage and adult groups, respectively. The memory of pain, asked at the follow-up visit, correlated with maximal pain VAS reported at the time of abortion being 73 in all women (78 [62-90] in teenagers and 70 [46-83] in adult women, *P* = .052). Table 2 presents the outcome measures on pain and need of analgesics among teenagers and adult women.

TABLE 2 Comparison between teenage and adult women in various outcome measures. The results are n (%) unless stated otherwise

	Teenagers (n = 56)	Adult women (n = 76)	*P* value
Severe pain VAS ≥70[a]	34 (68.0) - Minors 11 (64.7) - 18- to 19-year-olds 23 (69.7)	37 (50.7)	.056
Mild/tolerable pain VAS ≤40[a]	1 (2.0)	16 (21.9)	.002
Need of additional analgesics[a]	48 (96.0)	67 (91.8)	.351
Given additional narcotic analgesics[a]	19 (38.0) - Minors 11 (64.7) - 18- to 19-year-olds 8 (24.2)	6 (7.9)	<.001
Misoprostol administration			
At hospital	24 (42.9)	2 (2.6)	
At home	32 (57.1)	74 (97.4)	<.001
Additional narcotics used:			
Misoprostol administered at home	3 (10.7)	2 (2.8)	
vs in hospital[a,b]	14 (63.6) (*P* < .001)	1 (50) (*P* = .001)	
Onset of pain before misoprostol administration[a]	19 (38.8)	32 (45.8)	.452
Reported emesis during medical abortion at any time[a]	34 (68.0)	35 (47.9)	.028
Satisfaction on care VAS (median, IQR)	91.0 (79.5-96.8)	92.0 (78.3-97.5)	.572
Analgesia reported as adequate (Yes, %)	43 (81.1)	51 (67.1)	.078
Would you choose medical abortion again? (Yes, %)	49 (89.1) - Minors 18 (94.7) - 18- to 19-year-olds 31 (86.1)	70 (92.1)	.555

[a]Pain diary was missing from six teenagers and three adult women and thus the information of these was missing.

[b]Narcotic analgesics were mainly given at hospital orally or intramuscularly. Two teenagers and three adult women reported use of their own tablets containing combination of paracetamol and codeine.

A total of 38.7% of women reported the onset of pain before misoprostol intake. The duration of pain (defined as the last recorded VAS measurement after misoprostol administration) was longer among teenagers (52.3 [23.4-99.2] hours) than adult women (24.4 [5.3-68.3] hours, *P* = .007). Only 39.3% of all women did not report pain beyond 24 hours after misoprostol administration, the count being higher among adult women (48.0% vs 26.5% in teenagers, *P* = .018). Conversely, 29.5% of women reported pain still continuing 72 hours after misoprostol administration, whereas 11% of the adult women and none of teenagers reported pain only before misoprostol administration.

Most teenagers and adult women needed analgesics (96.0% vs 91.8%, *P* = .351) in addition to the prophylactic pain medication (Table 2). The teenagers needed analgesics more often (5.0 [3.0-8.3] vs 3 [2.0-5.5] times, *P* = .007) and were also more likely to receive additional narcotic analgesics compared with adult women (OR 6.84 [95% CI 2.49-18.82], *P* < .001). Altogether, 16.3% of women received additional narcotic analgesics; the proportion among minor women was as high as 64.7%. Two teenagers and three adult women reported use of their own tablets containing a combination of paracetamol and codeine.

Misoprostol was more often administered at hospital to teenagers than to adult women (n = 24, 42.9% vs n = 2; 2.6%, *P* < .001) due to local guidelines. Also, hospital administration of misoprostol was associated with higher use of additional narcotic analgesics (OR [adjusted for age group] 12.92 [95% CI 3.69-45.27], *P* < .001). Neither the proportion of women experiencing severe pain (VAS ≥70, 54.2% vs 61.1%, *P* = .539) nor the proportion reporting pain as tolerable (VAS <40, 8.3% vs 15.2%, *P* = .387) differed between the women managed at the hospital compared with at home. Both women treated at home and at hospital were very satisfied with the care (median VAS 91 [interquartile range 78-97] vs 92 [86-98], *P* = .193).

The risk factors of severe pain (VAS ≥70) during medical abortion were evaluated in all women (Table 3). A history of dysmenorrhea was associated with severe pain (adjusted OR 2.60 [95% CI 1.21-5.59], *P* = .014), as were reported emesis at any time during medical abortion (adjusted OR 5.24 [95% CI 2.38-11.57], *P* < .001)

TABLE 3 Predictors and associated factors of severe pain experience (pain VAS max. ≥70) in all women. Results of the regression analyses

Variable	Pain max. VAS ≥70 OR (95% CI)	*P* value	Pain max. VAS ≥70 Adjusted OR[a] (95% CI)	*P* value
Group				
Teens	2.07 (0.98-4.38)	.058		
Adults	1			
Dysmenorrhea[b]	2.74 (1.29-5.84)	.009	2.60 (1.21-5.59)	.014
No dysmenorrhea	1			
BMI				
<25 kg/m^2	1	.360		
>25 kg/m^2	1.56 (0.60-4.06)			
Anxiety at baseline				
Yes	2.50 (0.99-6.32)	.053	2.64 (1.03-6.77)	.044
No	1			
Smoking				
Yes	0.72 (0.34-1.52)	.393		
No	1			
Relationship status				
Single	0.62 (0.29-1.32)	.211		
In relationship	1			
Emesis during abortion				
Yes	5.65 (2.58-12.32)	<.001	5.24 (2.38-11.57)	<.001
No	1			
Sufficient pain medication				
No	9.00 (2.92-27.71)	<.001	12.53 (3.86-40.73)	<.001
Yes	1			
Place of misoprostol administration				
Hospital	0.84 (0.34-2.05)	.694		
Home	1			

[a]Adjusted for age group.

[b]That is, reported use of pain medication for menstrual pain. Reported menstrual pain was significantly higher in women who reported use of pain medication during menses (VAS 57.0 [34.3-69.8]) than in women with no such use (VAS 10.0 [0.0-23.3], *P* < .001).

and anxiety (adjusted OR 2.64 [95% CI 1.03-6.77], *P* = .044). A history of dysmenorrhea was associated with a higher number of analgesics needed (5 [3-9] vs 2 [1-5], *P* < .001). The odds of reporting emesis were higher if narcotic analgesics were used (OR 3.04 [95% CI 1.12-8.26], *P* = .029).

The satisfaction with care was high among all women (median VAS 91 [interquartile range 79-97]) and was similar among teenagers and adult women (Table 2). Administration vs no administration of narcotic analgesics (VAS 96 [90-99] vs 91 [78-97], *P* = .060) or the place of misoprostol administration (hospital VAS 92 [86-98] vs home 91 [78-97], *P* = .211) had no effect on satisfaction. Pain medication was assessed as adequate by 72.9% of all women, and 90.2% would choose medical abortion again in case of new abortion. Satisfaction with care did not differ significantly whether pain medication was assessed as adequate or not (VAS 92.0 [82.8 vs 97.0] vs 82.0 [68.0-97.0], *P* = .069).

4 | DISCUSSION

Maximal pain during early medical abortion is high, among both teenagers and adults. However, the maximal pain is less often mild or tolerable (VAS ≤40) among teenagers. The majority of women needed pain medication in addition to prophylactic ibuprofen and paracetamol, and most of the teenagers managed at the outpatient clinic received narcotic analgesics. Severe pain was associated with emesis during medical abortion, anxiety and reported history of dysmenorrhea. Nevertheless, the great majority of the women were satisfied with the treatment, and more than three of five evaluated pain medication as adequate.

Our study confirms that a history of dysmenorrhea is a predictive factor for severe pain during medical abortion.[4,8,15] We found no difference in the pain intensity between teenagers and adult women, but the consumption of analgesics was higher among teenagers,

which indicates that young age is also associated with experiencing stronger pain. One-third of women reported pain beyond 72 hours after misoprostol administration. Also, anxiety at baseline and reported emesis were associated with severe pain. The occurrence of emesis is likely to be partly explained by the use of narcotic analgesics. Due to difficulty in predicting the occurrence of emesis, we propose that all women undergoing medical abortion should be routinely administered antiemetic medication, especially if narcotic analgesics are needed.

The pain observed in the present study was more intense than that seen in most previous studies in medical abortion regimens containing various combinations of mifepristone and misoprostol.[5,8] Similarly, the onset of pain before misoprostol administration was more frequent (38.7%) than reported previously (11%).[27] As the most intense pain often occurs soon after misoprostol intake, there is a place for prophylactic pain medication to be used at the time of misoprostol administration as recommended by the WHO and RCOG guidelines on abortion care.[20,21] Moreover, the wide variation in the duration of pain calls for individualization of pain management.

Surprisingly, more than three of five women assessed the combination of ibuprofen and paracetamol as adequate. The higher use of additional narcotic analgesics among teenagers is likely to be due to their hospitalization during misoprostol administration. The hospital care during misoprostol administration was associated with more frequent use of narcotic analgesics but not with severe pain experience. As the reported pain was often severe, we assume that the use of narcotic analgesics, especially among teenagers, was well justified.

The satisfaction with care was high and 9 of 10 women would choose medical abortion again. Factors affecting patient satisfaction are diverse. Neither place of misoprostol administration nor use of narcotic analgesics seems to have an effect on patient satisfaction. We assume that good patient satisfaction is likely to be due to women's trust in the care, interaction between patients and healthcare providers and clear, understandable instructions. It is also notable that the study patients had an additional follow-up visit at the outpatient clinic, which might have had a positive effect on the overall satisfaction.

Studies on medical abortion among teenagers are scarce, which makes our study important. Local practice, where minors are hospitalized at the time of misoprostol intake and adult women are not, limits our study for several reasons. First, this had an effect on frequency of narcotic use and might also have had an influence on overall pain medication use, as women probably had easier access to pain medication in the hospital care. Still, women were not provided any narcotic analgesic for home use when misoprostol was administered at home. Second, it might have had an effect on patient selection. This must be kept in mind when comparing results of teenagers and adult women in our study. Also, our relatively small sample size limits the power of our study. The adult comparison group consisted of women aged 25-35 years. This was done for the sake of clarity but may also be seen as a shortcoming. The results are mainly based on self-reporting using a study diary, and due to this we might have overlooked some information. Additionally, the period of recruitment took longer than expected, probably due in part to decreasing abortion rates, especially among teenagers.[1]

5 | CONCLUSION

Most women experience severe pain during medical abortion. As only one of five adults and almost none of the teenagers reported pain as mild or tolerable, it is obvious that the combination of ibuprofen and paracetamol used in our study was not sufficient. A history of dysmenorrhea and emesis during abortion care were risk factors for severe pain. As most women experienced the worst pain within a few hours after misoprostol administration, administering pain medication at the time of misoprostol is likely to be valuable. Providing women with a small package (eg 10 tablets) of a weak opioid such as tramadol to be administered at home might be advisable, especially for young women and women with a history of dysmenorrhea. Furthermore, providing antiemetic medication might be valuable. Pain management during medical abortion needs to be improved further, and studies on optimizing pain medication are needed.

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CONFLICT OF INTEREST

OH has served on advisory boards for Bayer Healthcare, Gedeon Richter, HRA-Pharma and Sandoz AG, and designed and lectured at educational events connected with these companies. The other authors report no conflict of interests.

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