

# An epidemiological survey of symptoms of menstrual loss in the community

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## SUMMARY

**Background:** For the early detection of gynaecological malignancy, guidance based on presenting symptoms exists to aid a general practitioner (GP) in determining who to investigate or refer. The evidence for this advice is based on the prevalence of symptoms in women with gynaecological malignancy or within specialist clinics. There are no studies on the incidence of symptoms within the community.

**Aim:** To provide an estimate of the incidence of self-reported symptoms of menstrual loss in the community population of a single general practice.

**Design of study:** A prospective population-based cohort study of women identified through a baseline postal survey and followed 6 and 12 months later.

**Setting:** An urban general practice with four partners and 10 000 registered patients.

**Method:** A postal baseline survey was undertaken on all women aged 18–54 years on the practice age–sex register. Responders who consented to follow-up were sent further questionnaires at 6 and 12 months. All questionnaires enquired about the presence or absence of symptoms related to vaginal bleeding. Twelve-month cumulative incidence rates were calculated using responders to the baseline, 6-month and 12-month questionnaires.

**Results:** A total of 2435 questionnaires were initially sent out at baseline and 1513 (62%) women replied to all three questionnaires. The 12-month cumulative incidence of symptoms in menstruating women was: menorrhagia 25% (95% confidence interval [CI] = 22 to 29); periods heavier than usual, 21% (95% CI = 18 to 23); change in pattern of cycle, 29% (95% CI = 26 to 32); short cycle 21% (95% CI = 19 to 24); long cycle 15% (95% CI = 13 to 18); intermenstrual bleeding 17% (95% CI = 14 to 19); postcoital bleeding 6% (95% CI = 5 to 8); prolonged period 9% (95% CI = 7 to 11).

**Conclusion:** The development of symptoms of menstrual loss among women in the community is common, in contrast to the rarity of gynaecological malignancy. This raises concern about the usefulness of current guidelines, based on symptoms, advising women when to consult, and for the early detection of gynaecological malignancy in the community and primary care.

**Keywords:** cohort studies; guidelines; gynaecological malignancy; menorrhagia; menstrual cycle; menstruation; questionnaires.

## Introduction

MANY symptoms and illnesses are common in the general population, but only a minority result in consultations in primary care and even fewer in referral on to secondary care.<sup>1,2</sup> This raises difficulties for management guidelines based on secondary care, since, if applied to all symptoms in the community, the workload implications may be large and the yield of serious disease low.<sup>3</sup>

An example is symptoms of menstrual loss, which are common in the community,<sup>4–20</sup> but which may be taken to indicate serious pathology.<sup>21–25</sup> However, no studies exist concerning the incidence of such symptoms. In general, it is recognised that a change in status is more likely to be owing to significant pathology than a symptom that has been present for a long time, although some guidelines regard persistence of intermenstrual bleeding and postcoital bleeding as significant.<sup>21,22</sup> Knowledge of the frequency of change in status and persistence of symptoms in the general population may help to inform women when they should consult primary care and aid the appropriate referral of women for investigation of malignancy. We have, therefore, carried out a study to estimate the incidence and persistence of self-reported symptoms of clinically important vaginal bleeding in the community population of a single general practice.

## Method

The study took place in an urban general practice in England with four partners and a total registered population of 10 000 patients. The practice population resides in an area in the mid-range of deprivation and affluence, with Townsend scores from -3.6 to 5.5. The Townsend score is a grading system derived from census data involving four sociodemographic variables.<sup>26</sup> A positive score reflects greater deprivation.

The design was in two phases: first, a baseline cross-sectional population survey; and, second, a prospective cohort study following responders to the baseline postal survey at 6 and 12 months. All women in the age group 18–54 years registered with the practice were sent the baseline questionnaire. Non-responders were sent a second questionnaire after 2 weeks. Responders to the baseline questionnaire were asked for consent to the sending of 6- and 12-month follow-up questionnaires.

Box 1 gives the definitions of terms related to menstrual loss used in the study and derived from the questionnaire. Menstruating women were defined as those who replied 'yes' to the question 'have you had a period in the last 6 months?' and 'no' to 'are you currently pregnant or have you been pregnant in the last 6 months?'

The instrument used in the questionnaire to determine the women's perception of the heaviness of their menstruation has been validated and used in a previous study.<sup>5</sup>

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**HOW THIS FITS IN**

*What do we know?*

Guidelines for the early detection of gynaecological malignancy are based on symptoms in women with malignancy or within specialist clinics. The incidence of these symptoms in the community is unknown. It is known that for many symptoms in the community the 'iceberg' of symptoms and illness exists.

*What does this paper add?*

The incidence rates of so-called 'abnormal' bleeding are so high in the community that concerns exist about the relevance of current guidelines.



Menorrhagia was defined as 'heavy' menstruation that corresponded with a response to the question 'over the past 6 months how do you regard your periods?', of 'fairly heavy', 'very heavy' or 'variable' as opposed to 'very light', 'fairly light' or 'neither heavy nor light'. The question concerning periods heavier than usual was derived from a previous study<sup>6</sup> and modified to include an additional question concerning a changed pattern of cycle. Questions regarding bleeding within 3 weeks or more than 5 weeks from the previous period, and concerning a period lasting 10 days or more, were derived from the World Health Organisation's proposed definitions for 'clinically important bleeding patterns' in women aged 20–40 years.<sup>7</sup> The questions concerning bleeding between periods and bleeding during or after sexual intercourse were derived from clinical guidelines.<sup>21-23</sup> If a woman reported either of the latter two symptoms she was requested to record if it had occurred once, twice or three or more times in the previous 6 months.

Questions were also asked concerning consultation with primary and secondary care, hormonal contraception, female hormone use and contraceptive coil use. The ques-

tionnaires were piloted for comprehension and completion prior to the study.

Responders who only partially completed the questionnaires were contacted by telephone (three attempts were made), or if they did not have a telephone, a photocopy of the missing items was sent to them.

*Calculation of incidence rates*

All women who responded to the baseline questionnaire and consented to follow-up were sent a 6-month and 12-month questionnaire. The study population for incidence rates consisted of women who replied to all three questionnaires and were menstruating at baseline and not pregnant currently or in the previous 6 months at all three time points.

Cumulative incidence for each symptom was calculated as follows. All women in the baseline survey who were amenorrhoeic, pregnant or post-pregnancy (Box 1) were excluded. From the remaining menstruating women, all women who were free of the particular symptom at baseline were identified. This group at risk of developing the symptom of menstrual loss formed the denominator for calculation of the cumulative incidence of the symptom. All women who reported the presence of the symptom at either 6 months or 12 months were defined as incident cases, and cumulative incidence was defined as the proportion of the denominator represented by incident cases.

In the calculation of the persistence of the symptoms of intermenstrual and postcoital bleeding, the study population was that used for incidence rates. The proportion of women who replied 'yes' to the symptom at both baseline and 6 months was calculated.

*Calculation of prevalence rates*

In order to allow comparison with other studies, baseline prevalence rates were calculated using responders to the baseline questionnaire. The denominator population used

Box 1. Questions used in the survey and terms used in the text.

Questions	Response	Term
• 'Have you had a period in the last 6 months?' and 'Are you currently pregnant or have you been pregnant in the last 6 months?'	'Yes' and 'No'	Menstruating woman
• 'Have you had a period in the last 6 months?'	'No'	Amenorrhoea
• 'Are you currently pregnant?'	'Yes'	Pregnancy
• 'Have you had a period in the last 6 months?' and 'Are you currently pregnant or have you been pregnant in the last 6 months?' and 'Are you currently pregnant?'	'Yes' and 'Yes' and 'No'	Post-pregnancy woman
• 'Over the past 6 months how do you regard your periods?'	'Heavy'	Menorrhagia
• 'Have your periods been heavier than usual?'	'Yes'	Periods heavier than usual
• 'Has the pattern of the cycle of your periods changed from usual recently?'	'Yes'	Pattern of cycle changed
• 'Over the last 6 months have you had a period within 3 weeks (21 days) of the start of the previous period?'	'Yes'	Short cycle
• 'Over the last 6 months have you had a period which was more than 5 weeks (35 days) from the start of the previous period?'	'Yes'	Long cycle
• 'Over the last 6 months have you bled between periods?'	'Yes'	Intermenstrual bleeding
• 'Over the last 6 months have you bled during or after sexual intercourse (making love) when you were not on a period?'	'Yes'	Postcoital bleeding
• 'Over the last 6 months have you had a period lasting 10 days or more?'	'Yes'	Prolonged period

Table 1. Prevalence at baseline of symptoms of menstrual loss.

	Age 18–24 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 25–34 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 35–44 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 45–54 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Total <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI
Menorrhagia	218 (46.8) 40.3 to 53.4	390 (43.1) 38.3 to 48.0	479 (59.9) 55.5 to 64.2	338 (53.0) 47.6 to 58.2	1425 (51.6) 49.1 to 54.2
Periods heavier than usual	218 (16.1) 11.8 to 21.5	390 (17.7) 14.2 to 21.8	479 (29.2) 25.3 to 33.5	338 (23.1) 18.9 to 27.9	1425 (22.6) 20.4 to 24.8
Pattern of cycle changed	217 (22.1) 17.1 to 28.1	389 (21.3) 17.6 to 25.7	480 (30.2) 26.3 to 34.5	338 (52.7) 47.3 to 57.9	1424 (31.9) 29.5 to 34.3
Short cycle	217 (14.7) 10.6 to 20.1	391 (14.1) 11.0 to 17.9	479 (29.6) 25.7 to 33.9	338 (34.3) 29.5 to 39.5	1425 (24.2) 22.1 to 26.5
Long cycle	217 (21.7) 16.7 to 27.6	390 (17.2) 13.8 to 21.2	480 (16.5) 13.4 to 20.0	338 (36.4) 31.4 to 41.6	1425 (22.2) 20.1 to 24.4
Intermenstrual bleeding	217 (12.9) 9.1 to 18.0	391 (14.8) 11.7 to 18.7	480 (13.3) 10.6 to 16.7	338 (13.3) 10.1 to 17.4	1426 (13.7) 12.0 to 15.6
Postcoital bleeding	216 (7.4) 4.6 to 11.7	391 (6.9) 4.8 to 9.9	478 (8.6) 6.4 to 11.4	338 (2.1) 1.0 to 4.2	1423 (6.4) 5.2 to 7.8
Prolonged period	217 (6.0) 3.5 to 10.0	391 (7.2) 5.0 to 10.2	480 (8.8) 6.5 to 11.6	338 (14.2) 10.9 to 18.3	1426 (9.2) 7.8 to 10.8

<sup>a</sup>Number of menstruating women responding to baseline questionnaire. <sup>b</sup>Percentage with symptom.

was all menstruating women (Box 1) except for the calculation of prevalence of menstruating, amenorrhoeic, pregnant and post-pregnancy women, where the denominator was all women.

In the calculation of the number of times intermenstrual and postcoital bleeding had occurred in the 6 months prior to the baseline survey, the study population was menstruating women (Box 1) who responded to the baseline questionnaire. The proportion of women who replied one, two or three or more times was calculated.

### Analysis

Analyses were performed using SPSS 11.0 for Windows, and 95% confidence intervals (CIs) calculated using the Wilson method<sup>27</sup> and computer software for calculating confidence intervals.<sup>28</sup> Trends in rates by age were assessed using the  $\chi^2$  test for trend.

## Results

### Baseline survey

A total of 2435 questionnaires were sent out at baseline and 1861 women replied, giving a response rate of 76%. At baseline the mean age of responders was 38 years (standard deviation = 10.4 years). Non-responders at baseline were slightly younger than responders (mean difference = 3.6 years, 95% CI = 2.6 to 4.6).

The proportion of women who were menstruating was 77% (95% CI = 75 to 79), ranging from 88% at age 18–24 years to 57% at age 45–54 years. The prevalence of women who were amenorrhoeic was 20% (95% CI = 19 to 22) ranging from 7% at age 18–24 years to 43% at age 45–54 years. The prevalence of pregnant women was 1.6% (95% CI = 1.1 to 2.3), peaking at 4% at the age 25–34 years. The prevalence of post-pregnancy women was 2.0% (95% CI = 1.5 to 2.7), with a peak of 6% at ages 25–34 years.

The prevalence for starting or stopping hormonal contra-

ception, female hormones or the contraceptive coil in the previous 6 months was 14% of menstruating women.

The prevalences of all other symptoms are presented in Table 1.

The prevalence of menorrhagia as a proportion of menstruating women was 52% with a slight increase with age ( $P = 0.002$ ). Frequency of other symptoms ranged from 6% of menstruating women for postcoital bleeding to 32% for a change in the pattern of the cycle. All symptoms showed a significant increase with age except intermenstrual bleeding ( $P = 0.85$ ) and postcoital bleeding (significant decrease with age,  $P = 0.02$ ).

### Prospective cohort study

The baseline non-responders ( $n = 549$ ), women who had left the list during the subsequent 6 months ( $n = 25$ ), women who had mail returned as undelivered mail/moved house/addressee unknown ( $n = 23$ ), non-consenters to follow-up ( $n = 73$ ) and women with learning difficulties ( $n = 2$ ) were excluded from the 6-month follow-up mailing. One thousand, seven hundred and sixty-three women were sent a 6-month questionnaire and 1617 (92%) replied. Excluded from the 12-month follow-up mailing were women excluded from the 6-month mailing, women who had left the list during the subsequent 6 months ( $n = 21$ ) and women for whom the 6-month mailing was returned as undelivered mail/moved house/addressee unknown ( $n = 7$ ). One thousand, seven hundred and thirty-four women were sent a 12-month questionnaire and 1593 women replied, giving a response of 92%. Six women had the 12-month questionnaire returned as undelivered mail/moved house/addressee unknown. A total of 1513 women replied to all three questionnaires (62% of the original study population).

Non-responders at 6 months and at 12 months were younger than responders ( $P < 0.001$ ) and less likely to be married or cohabiting ( $P < 0.01$ ).

Table 2. Twelve-month cumulative incidence of symptoms of menstrual loss.

	Age 18–24 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 25–34 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 35–44 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Age 45–54 years <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI	Total <i>n</i> <sup>a</sup> (% <sup>b</sup> ) 95% CI
Menorrhagia	73 (24.7) 16.2 to 35.6	156 (22.4) 16.6 to 29.6	158 (25.3) 19.2 to 32.6	144 (27.8) 21.1 to 35.6	531 (25.0) 21.5 to 28.9
Periods heavier than usual	114 (15.8) 10.2 to 23.6	219 (16.0) 11.7 to 21.4	279 (24.4) 19.7 to 29.7	235 (22.6) 17.7 to 28.3	847 (20.5) 18.0 to 23.4
Pattern of cycle changed	108 (16.7) 10.8 to 24.8	210 (24.3) 19.0 to 30.5	277 (31.4) 26.2 to 37.1	144 (39.6) 32.0 to 47.7	739 (28.8) 25.7 to 32.2
Short cycle	117 (15.4) 10.0 to 23.0	233 (16.3) 12.1 to 21.6	280 (22.5) 18.0 to 27.7	197 (29.4) 23.5 to 36.2	827 (21.4) 18.7 to 24.3
Long cycle	109 (9.2) 5.1 to 16.1	221 (11.8) 8.2 to 16.7	325 (10.5) 7.6 to 14.3	190 (30.0) 23.9 to 36.9	845 (15.0) 12.8 to 17.6
Intermenstrual bleeding	123 (24.4) 17.7 to 32.7	229 (16.6) 12.3 to 22.0	338 (17.2) 13.5 to 21.5	261 (12.3) 8.8 to 16.8	951 (16.6) 14.4 to 19.1
Postcoital bleeding	127 (12.6) 7.9 to 19.5	249 (7.2) 4.6 to 11.1	353 (4.8) 3.0 to 7.6	295 (3.4) 1.9 to 6.1	1024 (6.0) 4.7 to 7.6
Prolonged period	128 (4.7) 2.2 to 9.8	248 (8.1) 5.3 to 12.1	357 (7.0) 4.8 to 10.1	258 (14.7) 10.9 to 19.6	991 (9.0) 7.4 to 10.9

<sup>a</sup>Number of women menstruating at baseline who did not have the symptom at baseline, responded to all three questionnaires and were not pregnant or pregnant in the previous 6 months in any of the three questionnaires. <sup>b</sup>Percentage developing the symptom at the 6- or 12-month questionnaires.

The 12-month cumulative incidence of symptoms is shown in Table 2. The 12-month incidence of menorrhagia was 25% of menstruating women. There was no significant variation with age ( $P = 0.40$ ). The incidence of other symptoms varied from 6% for postcoital bleeding to 29% for a change in the pattern of the cycle. All showed a significant increase with age except for intermenstrual bleeding and postcoital bleeding, which showed significant decreases (for all trends,  $P < 0.05$ ). Postcoital bleeding showed the largest variation, with an incidence of 3% in the age range 45–54 years and 13% in the age range 18–24 years ( $P < 0.001$ ).

The proportion of menstruating women who had persisting intermenstrual bleeding was 5.7% and postcoital bleeding 2.6%. The proportion with intermenstrual bleeding who reported at baseline that it occurred three or more times in the previous 6 months was 34% and for postcoital bleeding 30%.

Of the 47 menstruating women who reported postcoital bleeding in at least two questionnaires, only 14 (30%) had ever seen or were waiting to see a gynaecologist about their periods.

## Discussion

### Summary and main findings

We have found high prevalence and incidence figures within the community for many of the symptoms of so-called 'abnormal' vaginal bleeding. This would suggest that such subjective self-reported symptoms and the development of these symptoms are common within a community population, in line with the concept of the 'iceberg' of symptoms and illness.<sup>2</sup>

### Strengths and limitations of the study

This study used the whole adult female population aged 18–54 years registered with an urban group general practice within the United Kingdom (UK). The practice population

resides in electoral wards of average deprivation. The response was high, although there was some evidence that responders differed from non-responders in being older and more likely to be married or cohabiting. The effect of this potential source of bias is unknown.

Controversy exists as to whether menstrual symptoms should be studied or managed using objective assessment with menstrual diaries and charts or subjective assessment using a woman's description of her symptoms.<sup>23,29,30</sup> Objective assessment tends to give a lower prevalence than subjective assessment. The advantage of the former is that it appears to be more accurate, as it is less susceptible to observer and recall bias. Recall bias increases as the interval between the event and report increases, and occurs even with daily record charts, as the majority are not completed at the allotted time.<sup>31</sup> The advantage of the self-reporting of symptoms is that it reflects clinical practice. Within the UK it is rare for a woman with symptoms of increased vaginal bleeding to present to primary care with a completed menstrual chart, although it is more common in some countries.<sup>11</sup> Menstrual charts are available for UK general practice<sup>23</sup> but are not widely used.

### How and why this study agrees or disagrees with the existing literature

There are difficulties in comparing studies on symptoms of vaginal bleeding for several reasons. Variation occurs in the definitions of symptoms of menstrual loss, thus producing inconsistency in the numerator for the calculation of rates. The means of assessment chosen in this study were designed to reflect clinical practice, and questions were based on previous studies and symptoms used in clinical guidelines. Another difficulty is that there is no consensus on the denominator, with authors using menstruating women,<sup>5,10</sup> all women,<sup>14,18</sup> or the total population.<sup>32</sup> In this

study the denominator used was menstruating women, as they were at risk of symptoms of menstrual loss. The characteristics of the populations also vary and it is known that the prevalence of many symptoms is dependent on culture,<sup>8</sup> contraceptive use,<sup>10</sup> and age.<sup>10</sup> This restricts the generalisability of the study.

Twelve-month cumulative incidence rates for all symptoms were high, ranging from 3% of menstruating women reporting the onset of a new episode of postcoital bleeding to 40% reporting 'pattern of cycle changed' in the age group 45–54 years. There are no comparable studies on incidence rates.

With regard to prevalence, comparable studies exist using subjective assessment. The prevalence of menorrhagia was almost identical to the figure in an earlier study on a sample of the same population,<sup>4</sup> while a lower prevalence was found in a study in Oxfordshire.<sup>5</sup> A similar prevalence was found for 'periods heavier than usual' to those in an earlier study.<sup>6</sup> The prevalence of 'pattern of cycle changed' when compared to figures given in other studies for irregular cycles<sup>10,11</sup> were also similar. The prevalence of long cycles and that of the duration of menstrual flow were similar to previous studies.<sup>10,11,18</sup> The prevalence of a short cycle was 24% of menstruating women, and other studies report a range from 1% of all women<sup>14</sup> to 19% of menstruating women<sup>11</sup> in different age groups. Concerning intermenstrual bleeding, the prevalence in studies varies from 2% of all women<sup>18</sup> to 17% of menstruating women,<sup>10</sup> which compared to 14% in this study. One community study reported a prevalence of postcoital bleeding in a family planning clinic of 5%.<sup>20</sup> In this study the prevalence was 6% of menstruating women in the age range 18–54 years.

### Implications for future research and clinical practice

As with many symptoms, those of menstrual loss are common in the general population. Our study has confirmed that new episodes of these symptoms, representing a change in status, are also quite common. This is the background to GPs' decision making about the need to investigate or refer. The annual incidence of malignant neoplasm of the cervix uteri and corpus uteri is 11 and 17 per 100 000 of the population, respectively.<sup>33</sup> In comparison with the incidence of any of the symptoms of menstrual loss, gynaecological malignancy is rare in the community. This raises concern about the usefulness of current guidelines, based on symptoms, advising women when to consult, and for the early detection of gynaecological malignancy in the community and primary care.

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