Female Military Officers’ Desire for Menstrual Suppression During Training: Characteristics and Bone Health Implications

Emily A. Southmayd, PhD
Department of Military and Emergency Medicine
Consortium for Health and Military Performance
Henry M. Jackson Foundation for the Advance of Military Medicine
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Uniformed Services University of the Health Sciences
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Objectives

• Part I:
  ▪ Describe female military officers’ desire for menstrual suppression during a 6-month secondary leadership training course

• Part II:
  ▪ Present current known effects of oral contraception on bone health
  ▪ Discuss directions for future study
Part I: Oral Contraception for Menstrual Suppression in Military Servicewomen
Having a monthly menstrual period, though natural and a sign of reproductive health in women, may present additional logistical burdens for women in the military:
- Transporting, storing, changing, and disposing sanitary products
- Managing menstrual symptoms (e.g. cramps, headaches, spotting)

Menstrual bleeding can be safely suppressed with hormonal contraception (ex. continuous oral contraception, skipping placebo week).

Studies show continuous/extended cycle oral contraception is safe for endometrial health and may improve menstrual symptoms.\(^1\)
In one study, >80% of Servicewomen expressed a desire for menstrual suppression during training and/or deployment\(^2\).

To obtain a greater understanding of the desire for menstrual suppression in military women, Trego and colleagues developed the: **Military Women’s Attitudes Towards Menstrual Suppression (MWATMS)**

- 55-item questionnaire\(^3\)
- 9-item short-form\(^4\)

In this survey, previously deployed women expressed a positive attitude about menstrual suppression during deployment\(^4\).

No literature to date reports results from the MWATMS administered to women in a military training environment, which differs from an austere deployed environment.
To assess responses to the 9-item MWATMS Questionnaire (modified to specify the training environment) in female military Officers participating in a 6-month secondary training course
### Methods

- MWATMS Questionnaire was administered at the beginning (baseline) and end of 6-mo training (post)

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**Please select the option that best describes how much you agree or disagree with each statement**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Does not apply to me</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The stress of training makes my period worse than usual.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The stress of training increases my menstrual symptoms and bleeding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I think that stopping periods while training is a good idea.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The stress of training magnifies my PMS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Not having to worry about menstrual supplies, pads, tampons, and panty liners is a good reason to stop my period while I’m training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I would stop my period to avoid the inconvenience of getting it during training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. It is difficult to deal with my period during training because there is no privacy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. During training, it is difficult to find adequate facilities in which I can attend to menstrual hygiene.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. During training, I do not get the opportunity to use adequate facilities for my menstrual hygiene needs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lifecycle of a Servicemember
Baseline Results

- Baseline (n=147 female officers)

<table>
<thead>
<tr>
<th>Subject Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>25.1 ± 0.3</td>
</tr>
<tr>
<td>Age of Menarche (yrs)</td>
<td>13.0 ± 0.1</td>
</tr>
<tr>
<td>During the last 12 mo, have you taken birth control pills or</td>
<td></td>
</tr>
<tr>
<td>used any other hormonal therapy?</td>
<td>Yes 49%</td>
</tr>
<tr>
<td></td>
<td>No 51%</td>
</tr>
<tr>
<td>During the last 12 mo, have you ever missed six consecutive</td>
<td></td>
</tr>
<tr>
<td>menstrual cycles?</td>
<td>Yes 15%</td>
</tr>
<tr>
<td></td>
<td>No 85%</td>
</tr>
</tbody>
</table>
The majority of women support the idea of menstrual suppression during training.

**Baseline Results**

- **I think that stopping periods while women are training is a good idea**
  - Strongly Agree: 27 (18%)
  - Agree: 59 (40%)
  - N/A: 14 (10%)
  - Disagree: 30 (21%)
  - Strongly Disagree: 16 (11%)

- **I would stop my period to avoid the inconvenience of getting it during training**
  - Strongly Agree: 52 (35%)
  - Agree: 52 (35%)
  - N/A: 6 (4%)
  - Disagree: 23 (16%)
  - Strongly Disagree: 14 (10%)
The majority of women **disagree** that the stress of training worsens menstrual experiences.

### Baseline Results

<table>
<thead>
<tr>
<th>The Stress of Training...</th>
<th>67%</th>
<th>70%</th>
<th>63%</th>
</tr>
</thead>
<tbody>
<tr>
<td>...makes my period worse than usual</td>
<td>n=99</td>
<td>n=103</td>
<td>n=92</td>
</tr>
<tr>
<td>...increases my menstrual symptoms and bleeding</td>
<td>n=25</td>
<td>n=25</td>
<td>n=37</td>
</tr>
</tbody>
</table>

- **67%** of 99 respondents disagree that stress of training makes their period worse than usual.
- **70%** of 103 respondents disagree that stress of training increases their menstrual symptoms and bleeding.
- **63%** of 92 respondents disagree that stress of training magnifies their PMS.
Baseline Results

Menstrual Logistics During Training

- Not having to worry about menstrual supplies, pads, tampons, and panty liners is a good reason to stop my period while I'm training
- During training, I do not get the opportunity to use adequate facilities for my menstrual hygiene needs
- During training, it is difficult to find adequate facilities in which I can attend to menstrual hygiene
- It is difficult to deal with my period during training because there is no privacy

- A large proportion of women agree that there are logistical challenges and burdens to dealing with menses during training

| Not Having to Worry About Menstrual Supplies | Agree: 73%, n=107 | N/A: 49%, n=72 | Disagree: 67%, n=99 |
| During Training I Do Not Get the Opportunity to Use Adequate Facilities | Agree: 50%, n=73 | N/A: 0%, n=0 | Disagree: 100%, n=0 |

0% 50% 100%
- Post-Training (n=19 of original 147 female officers)
- The opinion shifted towards “agree” that the stress of training increases menstrual symptoms and bleeding
- No other significant changes were observed
Women participating in military training express logistical burdens of menstruation and desire menstrual suppression.

Women who desire menstrual suppression during training should be educated from a healthcare provider about the availability & efficacy of continuous oral contraceptive therapy.

Alternative routes of hormonal contraception administration (e.g. ring, patch) require additional investigation for menstrual suppression efficacy.

Additional risks and benefits of continuous oral contraceptive therapy and other forms of menstrual suppression on women’s health require further investigation.
While continuous combined oral contraceptive (COC) therapy has demonstrated safety and efficacy for reproductive health, other physiological systems may be affected.

In particular - Bone health

- Estrogen influences bone health
- In the military, optimal bone health is a priority to reduce prevalence of stress fractures
- The relationships between COC, bone health, and fracture risk are not fully understood
Stress fractures represent a significant health and economic burden for the military

- 3-21% of females sustain a stress fracture during U.S. military basic training

- Stress fractures may lead to:
  - Lost training time
  - Failure to complete training
  - Medical discharge
  - Increased risk for future stress fractures
  - Potential long-term disability
Stress Fracture in Military Women
Stress Fracture in Military Women

Identifying factors affecting bone health and fracture risk in military women is necessary.

Could reproductive hormones play a role?
Endogenous Estrogen and Bone

• Estrogen positively influences bone health
• Estrogen is anti-resorptive
  ▪ Inhibits osteoblast apoptosis
  ▪ Promotes osteoclasts apoptosis
  ▪ Net bone formation
• Bone mineral density (BMD) is often lower in amenorrheic women (hypoestrogenic)
• Amenorrhea is a reported risk factor for stress fractures in military women⁶,⁷
Exogenous estrogen via COC therapy affects bone via *first pass metabolism* of COC in the liver.
Growth Hormone (GH)/IGF-1 Axis, Bone Turnover, and COC Use

- GH pulse dynamics altered and IGF-1 ↓ with COC use\(^9,10\)
- Biomarkers of bone formation and resorption are lower in COC users compared to non-users\(^8\)
- One study has shown decreased bioavailable IGF-1 in female recruits with stress fractures during 4-mo basic training compared to non-stress fractured recruits\(^11\)

\(^9\) Elkazazet and Salama *Endocrine* (2015)

\(^10\) Karlsson et al. *Gynecol Obstet Invest* (1990)

\(^11\) Elkazazet and Salama *Endocrine* (2015)
COC use alters GH/IGF-1 axis and may lead to:
- ↓ bone formation
- ↓ bone turnover
- ↑ stress fracture risk
COC and Bone Density

- The evidence about the effect of COC on bone mineral density (BMD) is inconclusive
- BMD has been reported to increase\textsuperscript{9,12,13}, decrease\textsuperscript{9}, or not change\textsuperscript{14-18} in response to COC use
  - In military cadets, lumbar spine BMD was lower in COC users vs. non-users\textsuperscript{19}
- COC use may attenuate peak BMD accrual\textsuperscript{20,21}
- Low BMD may increase stress fracture risk\textsuperscript{22}
COC, BMD, and Stress Fractures

• Paradox:
  ▪ Lower bone turnover in COC users,
  ▪ Lower BMD in COC users,
  ▪ And greater stress fracture risk in women with low BMD...

• ...COC use has been reported to be **protective** against stress fractures in athletes
  ▪ Runners that **never** used COC were >2x more likely to have a stress fracture than COC users\(^{23}\)
  ▪ In runners and recreational aerobic exercisers, more women without stress fractures took COCs compared to women with stress fractures\(^{24}\)
  ▪ Other studies report no significant difference in stress fracture rate between COC users and non-users\(^{25-27}\)
Summary

• Gaps exist in our understanding of the effects of COC on bone metabolism, BMD, and stress fracture risk in female servicewomen

• Interactive effects of exercise and COC use on bone metabolism likely mitigate stress fracture risk, which requires further investigation\textsuperscript{16}

• Women in the military express a desire for menstrual suppression, which can be achieved with continuous COC therapy

• It is important to understand the possible effects of continuous COC use on stress fracture risk when making recommendations for menstrual suppression in the military
Prospective studies are needed to rigorously assess COC use and stress fracture occurrence and bone physiology in military women.

Other forms of hormonal contraception that avoid the first-pass effect should be explored in relation to bone health (vaginal ring, transdermal patch).

Physicians should be aware of all possible risks and benefits of hormonal contraception and should educate female patients accordingly.
References


References


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Participants
For Further Information

Please contact:
emily.southmayd.ctr@usuhs.edu