Research suggests pain perception is influenced by the menstrual cycle, with pain being generally enhanced during the luteal (premenstrual) phase. At this time, however, it is unclear how menstrual phase influences pain. For example, it is unknown whether the menstrual cycle exerts influence at spinal or supraspinal levels, or whether the relationship between spinal and supraspinal nociception is altered. To examine these issues, healthy women were tested during the follicular and luteal phases of the menstrual cycle. Spinal nociceptive processing was assessed from the nociceptive flexion reflex (NFR), a spinal reflex elicited by activation of A-delta fibers. Pain perception was also assessed at each testing session from electrocutaneous pain threshold, electrocutaneous pain tolerance, and pain ratings of suprathreshold electric stimuli.

**Objective**

To determine if menstrual cycle phase influences spinal nociceptive processes, pain perception, and the relationship between spinal nociceptive processes and pain perception.

**Participants**

- **Healthy Female Participants:** N = 41
  - Participant Characteristics: White, non-Hispanic (71%); married (73%); employed full-time (65%); yrs of education = 15 (SD = 1.79); average age = 31.00 yrs (SD = 8.86); average menstrual cycle length = 29 days (SD = 3.28); average length of luteal phase = 15 days (SD = 3.48)

- **Exclusion Criteria:**
  - <18 years of age
  - Failure to regular cycle within 2 months of study inclusion
  - History of hormone preparations within 6 months
  - Pregnant within past 6 months
  - Menopausal or premenopausal
  - Current acute illness
  - Alcohol or substance abuse
  - Recent use of any medication, circulatory, and/or hearing problems
  - Recent use of analgesic medication
  - Current use of antidepressants or anti-psychotic medication

**Procedure**

- Nociceptive Flexion Reflex (NFR)
- Pain Ratings
- Data Analysis

**Results:**

- **NFR Threshold & Suprathreshold**
  - The main effect of menstrual phase was not significant (F(1, 29) = .27, p = .61) for NFR thresholds, indicating NFR threshold did not differ across the luteal and follicular phases of the menstrual cycle.
  - The main effect of menstrual phase was not significant (F(1, 34) = .52, p = .45) for suprathreshold ratings, indicating suprathreshold ratings did not differ across the luteal and follicular phases of the menstrual cycle.

- **Pain Threshold and Tolerance**
  - The main effect of menstrual phase was significant (F(1, 33) = 5.03, p = .03) for pain threshold, indicating pain threshold was significantly lower during the luteal phase.
  - The main effect of menstrual phase was significant (F(1, 29) = 4.50, p = .05) for pain tolerance, indicating pain tolerance was significantly lower during the luteal phase.

- **NFR Threshold & Pain Threshold**
  - The main effect of menstrual phase was not significant (F(1, 29) = .27, p = .61) for NFR thresholds, indicating NFR threshold did not differ across the luteal and follicular phases of the menstrual cycle.

- **NFR Threshold & Pain Tolerance**
  - The main effect of menstrual phase was not significant (F(1, 29) = .27, p = .61) for NFR thresholds, indicating NFR threshold did not differ across the luteal and follicular phases of the menstrual cycle.

**Conclusions**

- Future research should also investigate these issues in women whose pain and/or emotion systems may be dysregulated (e.g., women with fibromyalgia or premenstrual dysphoric disorder)