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## Abstract

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# Black cohosh has central opioid activity in postmenopausal women: evidence from naloxone blockade and positron emission tomography neuroimaging.

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### Abstract

**OBJECTIVE:** To test whether **black cohosh** (BC) exhibits an action on the central endogenous opioid system in postmenopausal women.

**DESIGN:** This was a mechanistic study conducted in the same individuals of luteinizing hormone pulsatility with a saline/naloxone challenge (n = 6) and positron emission tomography with [C]carfentanil, a selective micro-opioid receptor radioligand (n = 5), before and after 12 weeks of unblinded treatment with a popular BC daily supplement.

**RESULTS:** BC treatment for 12 weeks at a standard dose (Remifemin, 40 mg/day) had no effect on spontaneous luteinizing hormone pulsatility or estrogen concentrations. With naloxone blockade, there was an unexpected suppression of mean luteinizing hormone pulse frequency (saline vs naloxone = 9.0 +/- 0.6 vs 6.0 +/- 0.7 pulses/16 h; P = 0.056), especially during sleep when the mean interpulse interval was prolonged by approximately 90 minutes (saline night interpulse interval = 103 +/- 9 min vs naloxone night interpulse interval = 191 +/- 31 min, P = 0.03). There were significant increases in mu-opioid receptor binding potential in the posterior and subgenual cingulate, temporal and orbitofrontal cortex, thalamus, and nucleus accumbens ranging from 10% to 61% across brain regions involved in emotional and cognitive function. In contrast, binding potential reductions of lesser magnitude were observed in regions known to be involved in the placebo response (anterior cingulate and anterior insular cortex).

**CONCLUSIONS:** Using two different challenge paradigms for the examination of central opioid function, a neuropharmacologic action of BC treatment was demonstrated in postmenopausal women.

### Comment in

Commentary on **black cohosh** for the treatment of menopausal symptoms. [Menopause. 2008]

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