

Title: Can a Static Magnetic Field of a Concentric Multipole Magnet Reduce Menstrual Pain?

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Introduction: Magnetic therapy has been used to reduce or eliminate pain based on the effect of static magnetic fields (SMF) from magnets of an array of designs, materials and intensities. Pain related targets have been extensive including chronic pelvic pain. The processes at work may impact blood flow which have been reported to increase, decrease or remain unchanged. Impacts on inflammatory processes and alterations in pain thresholds have been suggested. The use of concentric multipole magnets has been suggested to provide an efficacious design but systematic application of such an approach to the rapid amelioration of dysmenorrhea pain has not been systematically studied.

Objective: Our objective was to evaluate the effectiveness of a concentric multipole magnet regarding its impact on dysmenorrhea pain (Menstrual or Period Pain).

Methods: Women with period pain self-rated as ≥ 6 on the Numeric Pain Rating Scale (NPRS) participated. The NPRS is a pain scale that is a numeric version of the visual analog scale. In the NPRS, subjects select an integer from 0 to 10 for their pain intensity; 0 is no pain and 10 the worst possible pain. After rating their entry pain, a magnet or sham was secured to an abdominal site close to the largest source of pain for 40 minutes. The magnet is of a concentric design with a surface field at its center of 500mT and an intensity of 60 mT at 4.5 mm. The magnet (25.4 mm wide, 3.5 mm thick and 14.5 g) is visually indistinguishable from the sham. After placement, subjects were free to go about their business. Upon returning, pain was again rated. Subject and experimenter were "blind" to whether a magnet or sham was used. Outcomes were determined by chi square analysis of the number of subjects in whom pain was or was not reduced. Subjects with NPRS ratings reduced by $\geq 35\%$ were scored as having reduced pain; reductions $< 35\%$ were scored as no change.

Results: As of this writing 24 females have been evaluated, 14 with a magnet and 10 with a sham. Of the 14 with magnet, 10 had pain reduction and 4 did not. Of the 10 with sham, 2 had pain reduction and 8 did not. The difference between magnet and sham treatment was statistically significant $p < 0.05$. Entry pain levels (mean \pm SD) for the groups were similar, with magnet and sham groups being respectively 6.93 ± 0.76 vs. 6.60 ± 1.07 and post-treatment scores of 3.96 ± 1.99 vs. 5.00 ± 1.49 . Pain reduction was $42.1\% \pm 30.9\%$ for magnet treated vs. $24.6\% \pm 18.3\%$, $P < 0.05$ for sham treated. All subjects reported no negative effects associated with wearing the magnet

Conclusions: The fact that, as of now, 71.4% of subjects who wore the magnet had a meaningful pain reduction whereas only 20% of subjects who wore the sham received a pain reduction, suggests a potentially favorable effect of the active magnet. If this finding maintains with increased number of subjects (planned for 30 in each group), the SMF from this magnet type may be considered a possible alternative to traditional pain management such as pharmaceutical medication. The magnet could be especially useful in women who are unable or unwilling to take medication or as a non-side effect substitute. In addition, this study provides a framework and background for further research into menstrual pain and its treatment.