that used analgesic as a positive control, with ginger demonstrating similar improvements to the analgesic drug treatments.

Whilst the study reported ginger to be effective for treatment of primary dysmenorrhea, the results are limited by a number of factors. Firstly, the studies included had small sample sizes, ranging from 22-150 subjects. Six of the seven RCTs were reported to exhibit low to moderate risk of bias. Furthermore, authors reported an asymmetrical funnel plot was produced by the meta-analysis, indicative of publication bias. The authors note that the RCTs included did not analyse the constituents of the ginger used, nor reported whether the powders were prepared in a standardized manner, making it difficult to draw conclusions about particular constituents. Authors highlighted that as the efficacy was demonstrated with presumably different ginger preparations, the activity may thus be due to a variety of bioactive components having overlapping or synergistic effects. Accordingly, until more is known about individual constituents, highly purified ginger preparations may risk removing important bioactive compounds.

This first systematic review and meta-analysis to report on the subject concluded the evidence is suggestive of effectiveness of 750-2000mg ginger powder during the first 3-4 days of the menstrual cycle, for relief of pain and discomfort associated with primary dysmenorrhea. More high quality studies with larger cohorts will further establish the benefit and effect of ginger treatment.

Curcumin alleviates symptoms of PMS

Khayat S, Fanaei H, Kheirkhah M, Moghadam ZB, Kasaeian A, Javadimehr M. 2015. Curcumin attenuates severity of premenstrual syndrome symptoms: A randomised, double-blind, placebo-controlled trial. *Complement Ther Med* 23; 318-324.

Premenstrual syndrome (PMS) is one of the most common health problems affecting women during their reproductive years. Defined as recurrent mood and physical symptoms, usually in the luteal phase of the cycle, PMS has a high prevalence worldwide. Changes of prostaglandin levels and neurotransmitter levels play a major role in the pathophysiology of PMS symptoms, with prostaglandins mostly associated with physical symptoms and neurotransmitters more associated with the incidence of mood and behavioural symptoms. Whilst pharmaceutical medications, including fluoxetine and mefenamic acid, are sometimes used in the management of PMS, they are associated with side effects and often reserved for more severe cases.

Herbal and complementary medicines are frequently used for management of many female health conditions including PMS, menopausal symptoms, and dysmenorrhoea. Curcumin, one the key curcuminoids of *Curcuma longa* (turmeric) of the Zingiberaceae family, has demonstrated a number of actions that may support a beneficial role in the management of PMS, particularly its anti-inflammatory and antidepressant effects. Previous studies have demonstrated curcumin reduced prostaglandin synthesis through inhibition of the cyclooxygenase-2 (COX-2) enzyme and antidepressant effects in animal models have been associated with modulation of the neurotransmitters serotonin, dopamine, and norepinephrine. Accordingly, this randomised, double-blind, placebo-controlled study was designed to evaluate the effect of curcumin on the severity of mood, behavioural and physical symptoms of PMS.

The study was performed on female students residing in dormitories of a university in Tehran, Iran with data collected over 8 months. Inclusion criteria included healthy premenopausal women with regular menstrual cycles of between 21-35 days, being single, no medications, non-drinkers, non-smokers, no stressful events in the prior three months and no sensitivity to curcumin. Potential subjects completed daily questionnaires based on the PMS symptoms from the DSM-IV, for two cycles before randomisation in order to identify women with at least five symptoms of PMS. In total, 70 women were randomised to treatment of either capsules of curcumin or placebo, with 35 women in each group. Subjects were required to take their allocated intervention every 12 hours from 7 days prior to, and until 3 days after the onset of menstruation. The curcumin dosage was 100mg/12hr. Subjects completed the daily record questionnaire at their first, second and third menstrual cycles and average symptom severity after the three interventions was evaluated and compared to initial severity scores.

Treatment with curcumin capsules was associated with significant reduction in the physical, behavioural and mood scores compared to before intervention, with mean scores changing from 41.4 to 18.13, 22.8 to 9.21, and 37.8 to 15.13, respectively. The placebo intervention was associated with a significant reduction in physical scores from 46.7 to 38.50, and non-significant reductions reported for the behavioural and mood scores of 24.4 to 23.14 and 34.8 to 33.85, respectively. Collectively, total PMS score was significantly reduced in the curcumin group only. No side effects were reported for either group.

Despite its small size, this is a valuable study demonstrating a beneficial role of curcumin in treatment of PMS symptoms, and is the first study to report on the effect. Whilst the placebo group also achieved significant reduction in physical symptoms, it only just reached statistically significant with p value = 0.0425, compared to that of the curcumin group, p value < 0.0001. Future studies of greater sample size might provide greater insight into the differences in effects of placebo and curcumin on physical symptoms. Other areas of research that would benefit the understanding of the role of curcumin and turmeric in the treatment of PMS might include: studies of longer duration, with a breakdown of effect at each cycle to understand if benefits are experienced from the initial cycle or if a number of cycles are required for significant effect to take place; differing doses of curcumin to ascertain the optimal dose for management in PMS;, studies evaluating the effect of curcumin on neurotransmitters and inflammatory markers associated with PMS; and finally, a comparison of curcumin with *Curcuma longa* rhizome to assess if other constituents of turmeric apart from the curcuminoids also have a beneficial effect on symptoms of PMS.

Effect of fenugreek seed extract on sex hormones and sexual function in healthy females

Rao A, Steels E, Beccaria G, Inder WJ, Vietta L. 2015. Influence of a specialised *Trigonella foenum-graecum* seed extract (Libifem), on testosterone, estradiol and sexual function in healthy menstruating women, a randomised placebo controlled study. *Phytother Res* 29: 1123-1130.

Sexual functioning involves complex and varied interactions between sex hormones such as estradiol (E2) and testosterone, environmental factors, and the autonomic nervous system. Decreased sexual functioning is associated with significant emotional and psychological distress as well as lower sexual and relationship satisfaction. Low sexual desire, or low libido, is a clinical symptom of decreased sexual function and has been reported to affect 39% of pre-menopausal women.

Trigonella foenum-graecum (fenugreek) is rich in steroidal saponins that have been demonstrated to exert estrogenic effects and to increase sexual function in men. Accordingly, fenugreek is of interest for improving sexual function in women. The aim of the present study was to evaluate the effect of a *T. foenum-graecum* seed extract on sex hormones and sexual function in healthy menstruating women who reported low sexual drive in a randomised, double-blind clinical trial conducted at a single site in Brisbane.

In total, 80 healthy menstruating women who reported low sexual desire and were in a sexual relationship were recruited for the study, and allocated in a 1:1 ratio to either active treatment (n=40) or placebo (n=40). Subjects had regular menstrual cycles, were aged between 20-49 years, with no diagnosed chronic disease, body mass index <35 kg/m^2, blood pressure <130/90 mmHg, normal fasting blood glucose, and were using contraception to prevent pregnancy, including the oral contraceptive pill (OCP). Exclusion criteria included use of androgen therapy in the three months prior, pregnancy/breastfeeding, major life