

## Dietary Recommendations

By increasing fruit and vegetable intake to at least the five recommended portions a day, a better balance of vitamins and minerals can be achieved. This is relevant for PMS as many studies over the years have shown deficits in micronutrients in women suffering from PMS, particularly vitamin B6, Vitamin D, calcium, magnesium and manganese (Penland and Johnson, 1993, p1471; Bertone-Johnson et al, 2005, p1246; Shamberger RJ, 2003, p123; Thys-Jacob, 2005, p220; Facchinetti et al, 1991, p177; Moyad, 2003, p 69).

The lack of green vegetables in the diet in particular is one of the first issues that need to be addressed. Green vegetables are a rich source of calcium, magnesium and vitamin B6 and the patient needs to be advised that their introduction should be immediate. Calcium deficiency in particular is the most cited in the medical literature as being reliably found to be a player in PMS.

It is now becoming more understood that Vitamin D also plays a major role. In a cohort study that took place over a period of ten years, it was found that women who had the highest vitamin D and calcium intake in their diet had the lowest risk of developing PMS (Bertone-Johnson et al, 2005, p1246).

Thys-Jacob (2000, p220) believes that women suffering from PMS have an underlying calcium dysregulation with a secondary hyperparathyroidism and vitamin D deficiency and that PMS is a clinical manifestation of a calcium deficient state that is unmasked by the rise of hormone concentrations in the luteal phase of the cycle. Because the recent research is indicative of vitamin D deficiency in PMS, it would be wise for the patient to use this supplement in particular. This is because vitamin D is notoriously hard to obtain in the diet and most of it is produced by simply being in the sun. As we live in a climate that for six months of the year does not have very much sun, supplementation is advisable.

The general consensus now is that high calcium levels can inhibit the absorption of magnesium (Trickey, 2003, p361), and so when increasing calcium intake, magnesium intake should automatically be addressed. Magnesium is thought to help alleviate fluid retention and corresponding symptoms of breast tenderness, swelling of extremities, abdominal bloating and weight gain (Walker et al, 1998, p1157), pain and anxiety (Facchinetti et al, 1991, p177), and migraine (Li W et al, 2001, p83). Because of the close interrelationships of calcium and magnesium, gaining these nutrients from a balanced diet is probably the most desirable. However, if supplementing these nutrients, a combination of calcium and magnesium together would be best.

Discussing which green vegetables she is most likely to consume on a regular basis and how she can incorporate these into her recipes will be helpful towards achieving compliance. However, it also needs to be emphasised that a broad range of vegetables is ultimately desirable for an overall healthy diet, including red and yellow vegetables.

There will be a number of benefits of replacing crisps and biscuits with increasing fresh and dried fruits in the diet. Not only will vitamin and mineral intake be improved and undesirable fats be removed, this will also start to address blood sugar sensitivity (Moran and Norman, 2004, p719). Even at their most extreme level, blood sugar disorders such as diabetes (Moran, 2004, p615) and even the gynaecological disorder PCOS that is related to insulin resistance (Marsh and Brand-Miller 2005, p154), have been shown to benefit from a low glycaemic diet. There is little reason why slight blood sugar sensitivity should not also respond well. This form of diet is also becoming increasingly accepted within the scientific community as being ideal in achieving an overall healthy lifestyle including reducing the risk of heart disease, alleviating obesity and significantly increasing dietary fibre (Frost, Brynes, Bovill-Taylor and Dornhorst, 2004, p121; Pawlak, Ebbeling and Ludwig, 2002, p235).

Once the patient has successfully established five portions of fruit and vegetables daily, she can then be introduced to the concept of the Glycaemic Index. She can be given a Glycaemic Index chart (see appendix 2) and be told to choose foods mainly from the lower range, a few from the middle range and reserve the higher range as special treats. However, according to Worrall-Thompson, Blades and Suthering (2005, p17), she will be able to keep the overall GI balance of her meals low by mixing lower GI foods with higher GI foods. The suggestion here is that mixing pulses such as chickpeas, lentils and even baked beans to higher GI foods can actually lower the meal. So for instance, adding low GI baked beans to a high GI baked potato will slow down its digestion and absorption as glucose. The introduction of these pulses will only serve to increase her fibre intake also.

Terry et al, (2001, p529) in their 10 year cohort, found an inverse association between fruit and vegetable intake and colorectal cancer. They concluded that high consumption of cereal fibre alone was not necessarily beneficial, but increasing fruit and vegetable intake would be beneficial for those individuals who consume less than 2 servings a day.

The scientific basis for the role of essential fatty acids as a therapeutic aid for PMS appears to be a tricky one, with still no real indicator of how useful it really is. Various research on this matter over the last two decades is

contradictory and there is no agreement as to its effectiveness. Horrobin (1983, p465) cites three studies that have found evening primrose oil in particular to be effective for fluid retention, breast pain and irritability. But more recently the research suggests that EFA's and evening primrose oil (EPO) has no real effect (Budeiri et al, 1996, p60; Cerin et al, 1993, p93). Khoo et al (1990, p189) found in their prospective trial, randomised, double-blind and placebo-controlled cross over trial that the women on the placebo experienced as much relief as the women on evening primrose oil, thus indicating the placebo effect. Nether the less, EPO is still suggested as being an option in much recent literature.

It is interesting to note that magnesium, amongst others, is an important nutrient in the conversion of EFA's to PGE1 and it may be worth considering that treatment with EFA's such as EPO may be more effective if used concurrently with magnesium and indeed calcium too. Jones (1987, p 483) in an eight month study found that reducing women's dietary fat to 20% of energy reduced water retention in particular. Nagata et al, (2004 ,p594) also found that high intakes of fat were associated with premenstrual syndrome although this was together with a low carbohydrate intake. This study is of particular interest because it was conducted on Japanese women, a culture that even if they do have a high intake of fat, are more likely to have a better balance of EFA's as a whole.

There has been some suggestion that soy products could benefit PMS. Nagata et al (2004, p 599) found no association between soy product and isoflavone intake and PMS in a study that estimated intake using a food frequency questionnaire. However, Byrant et al, (2005, p731) have found that supplementing isolated soy protein (isoflavones) over seven months in a double blind placebo controlled cross over trial significantly reduced breast tenderness ( $p=0.018$ ), swelling ( $p=0.017$ ), cramps ( $p=0.025$ ) and headache ( $p=0.026$ ).

### Conclusion

There can be no doubt that the patient needs to increase her fruit and vegetable intakes in order to boost the vitamin and minerals that are indicated in PMS. The link between PMS and calcium, magnesium and vitamin D is extremely interesting and one is left to reflect upon whether long-term suffering of PMS is an indicator of later development of osteoporosis. Use of the Glycaemic Index when choosing foods will be useful for blood sugar irregularities in PMS. This is particularly as more severe disorders such as PCOS are now being thought to benefit from this. The case for essential fatty acids for PMS is tenuous and whilst it would be beneficial for the patient to

improve the ratio of her saturates versus PUFA, overall research suggests that it is a low fat diet that is found to be most beneficial for relieving symptoms of PMS. As the phytoestrogens in soya and its isolated constituents such as isoflavones are partial agonists to oestrogen, it can be deemed that they would be useful for this patient's case of PMS, as it is being caused by a relative oestrogen excess. However, the research suggests that adding soya to the diet alone may not have much immediate therapeutic value and that supplementing the isolated isoflavones would be more effective.