

Essential Fatty Acids: health benefits and risks

PART II: HEALTH BENEFITS SPECIFIC TO WOMEN'S HEALTH

August 2010 Edition

Part II of the subject on essential fatty acids is the continuation from the previous issue, July 2010. Here we present the health benefits that are specific to women's health issues including pregnancy. In this issue, you will learn about the great benefits of these nutrients on the health of the mother and the unborn.

DYSMENORRHEA

Dysmenorrhea (painful menstruation) is the most common gynecological complaint and the leading cause of recurrent short term school absenteeism among female adolescents. It affects more than 50% of women. During the luteal menstrual phase (the second half of the cycle) omega-6 fatty acids are released from phospholipids in the cell membrane in the uterine cavity. This causes an increased release of inflammatory molecules known as cytokines (prostaglandins). Cytokines induce painful cramps as well as systemic symptoms such as nausea, vomiting and headache. As EPA competes with the omega-6 fatty acid - arachidonic acid - in the cell membranes, increased dietary intake of omega-3 fatty acids will reverse the omega-6 fatty acid induced symptoms. EPA is more effective than DHA in counteracting the arachidonic acid's effects. So, taking fish oil that is rich in both can help reverse such symptoms. The concentration of omega-6 fatty acids is elevated in the blood and urine of Dysmenorrheic women during menstruation. Menstrual pain and menstrual discomfort have been found to be correlated with a low dietary intake of omega-3 fatty acids and a

high dietary intake of omega-6 fatty acids which distort the ratio towards abnormal levels. In addition, low dietary intake of vitamin B12 has been associated with the same condition. Omega-3 fatty acid intake has been shown to be valuable in the management of Dysmenorrhea. In one study, supplementation with up to 2 grams of omega-3 fatty acids daily for 3-4 months reduced menstrual discomfort significantly. Supplementation with 7.5 mcg of vitamin B12 daily potentiated the effect of the omega-3 fatty acids and reduced further the symptoms of dysmenorrhea. In another study, supplementation with 6 grams of natural omega-3 fish oil daily significantly relieved menstrual pain in adolescents. It seems that proper omega-3 intake in a diet would be associated with less menstrual discomfort and since the average American woman is severely deficient in omega-3 fatty acids, supplementation with at least 2 grams a day and up to 6 grams a day can relieve most of the symptoms of such women. Sometimes, the combination of non-steroidal anti-inflammatory drugs such as Motrin or Advil in small quantities along with 2 grams of fish oil can help alleviate the symptoms completely.

FERTILITY-INFERTILITY

While about 50 years ago women often focused on efforts not to become pregnant, today the problem is often the reverse, the inability to have a child. One reason for infertility is the delay in child bearing. Another reason for this change might be dietary changes

with decreased intake of omega-3 fatty acids and increased intake of omega-6 fatty acids. High carbohydrate intake results in increased levels of insulin in the blood and decreases fertility. In contrast, an elevated omega-3 FA intake can lead to an increase in fertility because of the improvement in the prostacyclin/thromboxane ratio; the higher the ratio, the easier to conceive. Rubenstein and colleagues studied a significant number of infertile patients undergoing in-vitro fertilization (IVF) in a prospective, randomized, double-blind, placebo controlled study; this is the most strict and well controlled type of medical study. In addition to ovarian stimulation, 50% of the women received a daily dose of 100 mg aspirin and the rest only placebo (sugar pill). The low dose aspirin treatment increased the pregnancy rate from 28 to 45% and doubled the implantation rate. Aspirin as well as fish oil decreases thromboxane production by endometrial cells and platelets, improving implantation. In IVF patients with low uterine blood flow the pregnancy rate is reduced. It is possible that the reduced pregnancy rate in women with a thin endometrium can be improved by increasing the uterine blood flow. This increase can be achieved by substances such as aspirin or fish oil, which decrease the thromboxane production and improve the prostacyclin/thromboxane ratio. The more prostacyclin locally produced and available the more relaxed the uterine blood vessels and the more blood flow will come to the uterus.

Pregnant women have lower arterial flow resistance than infertile women. A decrease in peripheral resistance in the uterine vascular bed leads to increased blood flow and tissue perfusion, which may improve uterine receptivity (the ability of the lining of the uterine cavity to welcome the embryo and allow it to implant). Good receptivity means acceptance by the mother and good supply of necessary nutrients for embryonic growth. Natural and clean fish oil may have a significantly positive effect in the improvement of success rate in patients who undergo IVF treatments and also to infertile couples who try to conceive naturally or with other than IVF methods.

PREGNANCY AND ESSENTIAL FATTY ACIDS

Pregnancy is a unique time in a woman's life. She surrenders many of her vital bodily functions to the unborn. Not only she needs to nourish herself, but also supply all necessary nutrients for proper development of the fetus. Omega-3 FAs are extremely important for all cellular functions of the unborn. Forty percent of human brain consists of omega-3 FA. Any deficiency of omega-3 during the pregnancy can have deleterious effects on the baby's developing brain and nervous system. As noted above, the average American woman is severely deficient in omega-3 fatty acids. This is a significant handicap considering that some of the most damaging pregnancy complications are associated with essential fatty acid imbalance. Preeclampsia, preterm labor, growth restriction, oligohydramnios and fetal loss can all be caused by imbalances in essential fatty acids which can cause abnormal uteroplacental blood flow; such blood flow abnormalities can directly cause all of these pregnancy complications. In addition, omega-3 fatty acids have anti-coagulant effects and as such, they decrease the thickness of the blood flowing into the placenta. This in turn reduces placental thrombosis (clotting) and helps the placental remain healthy. A healthy placenta is a guarantee for a healthy and well developed baby. A healthy balance of omega-3 and omega-6 fatty acids is certain to reduce the risk of placental vascular problems and the incidence of growth retardation and pre-eclampsia.

A large study involving 9000 pregnant women in Denmark found that women with low fish consumption were more likely to deliver prematurely and the neonates were growth retarded. Women, who never ate fish, were 3-4 times more likely to experience the above complications. This is really unfortunate considering that 80% of neonatal morbidity and mortality is the result of prematurity. Prematurity and growth restriction can permanently affect the health of the future adult. [January 2010 Edition-Fetal Nutrition Part I](#) - [February 2010 Edition-Fetal Nutrition Part II](#) A prospective cohort study recently confirmed that women who avoided seafood had a four-time increase in the incidence of preterm birth compared to women eating fish once weekly. A recent study also demonstrated that pregnant women with low levels of omega-3 fatty acids

were 8 times more likely to develop preeclampsia – a significant and potentially lethal condition for both mother and unborn. Babies born to women with preeclampsia, have high ratios of thromboxane (bad)/prostacyclin (good). Increased thromboxane relative to prostacyclin causes placental vascular constriction and this is responsible for the complications noted in preeclamptic women. Omega-3 FA such as EPA and DHA are known to decrease thromboxane production and increase prostacyclin production; this brings balance to the relationship between bad and good prostaglandins and in turn, a healthy placental blood flow.

A large study recently found that about 1 in 7 new mothers experienced depression during at least one phase of pregnancy; right before, during or after pregnancy. Some studies found higher levels of postpartum depression with 15% of postpartum women suffering from the condition and some experts believe that the incidence is twice as much but due to underreporting, not all cases are recorded. Recent results from a randomized double blind placebo controlled study involving pregnant women with a major depressive disorder suggest that gestational supplementation with omega-3 fatty acids exerts significant therapeutic benefit. While mood disorders in general have been linked in many cases with essential FA deficiency post partum, more difficulties appear to be associated with lower levels of omega-3's; lower DHA content in mother's milk has been correlated with elevated post partum depression rates. Although cultural factors may be involved, it is interesting that post partum depression incidence is about 12% in North America where seafood intake is limited compared to about 2% in Japan where fish consumption is high. A recent study reported that many mothers who develop postpartum depression have a low intake of fish and have lower levels of DHA in the breast milk that mothers who do not suffer such depression.

There is abundant literature suggesting general health benefits to women who consume adequate omega-3 fatty acids including a diminished risk of various afflictions such as breast cancer, osteoporosis, heart disease, arthritic problems, psychiatric illness, and

Alzheimer's disease in addition to the pregnancy specific benefits.

The benefits of gestational seafood consumption also appear to extend to the developing child. Gestational fish intake with adequacy of maternal omega-3 fatty acids during pregnancy and lactation has been associated with less allergic disease, improved eye and hand coordination, enhanced cognitive and behavioral functioning, improved sleep behavior and diminished risk of metabolic afflictions such as type I diabetes in the offspring. Reduced rates of cerebral palsy and improved intelligence quotients (IQ) measured at 4 years of age attest to the potential long term benefits for offspring of mothers ingesting marine source omega-3 fatty acids in pregnancy and lactation. Recent studies suggest that ample intake should be commenced prior to conception to secure adequate gestational EFA physiology as existing stores in maternal adipose (fatty) tissue appear to be relevant for proper fetal development. In review, omega-3 fatty acids are essential components of the human brain and are required for normal fetal development as well as maternal health during and after gestation. There is abundant evidence in the medical literature which links adequate gestational fatty acid status with maternal and fetal advantage. With noteworthy benefits suggested by numerous studies, various authors disagree with regulatory bodies that admonish pregnant women to limit fish intake.

It has been reported in scientific studies that fish oil can prevent gestational diabetes by increasing insulin sensitivity. Reduced maternal fatty acids consumption can cause glucose intolerance and gestational diabetes. This condition may cause fetal anomalies, preeclampsia, and abnormal fetal body composition with increased risk for adult diseases such as diabetes, hypertension, stroke and cardiovascular disease. Such complications can be prevented with proper marine life consumption and proper diet.

As omega-3 fatty acids are essential components of the human brain and are involved in fetal insulin regulation, growth and development, blood vessel formation and central nervous system (CNS) maturation it is important to maintain gestational sufficiency. With biochemical and

metabolic individuality in each person as well as limited available laboratory testing for EFA status in most clinical settings, it is difficult to quantify pre-existing maternal DHA levels and to determine specific individual requirements. Average intake of about 200-300 mg per day of DHA has been recommended in general to supply the omega-3 fatty acids needs of mother and child; unfortunately this is an arbitrary number. Considering that most Americans are loaded with 20 times more omega-6 FAs in comparison to their omega-3 FAs, it is my recommendation that individuals measure their omega-3/omega-6 ratio and then take the appropriate amount that will normalize this ratio. Such testing will become available and in my judgment, it will be a tremendous tool in the hands of obstetricians to motivate their patients for better and healthier nutritional choices. Increasing numbers of individuals consume minimal fish because of dietary preference or in response to public health warnings about toxicant contamination of seafood. One study for example reported a significant decline in fish consumption in response to national mercury advisory. Accordingly some pregnant women have deficient omega-3 fatty acid intakes with potential sequelae for themselves and their offspring. We are certainly in need of a sustainable solution to this public health concern. It is clear from existing knowledge that most marine life is contaminated and will be contaminated for many years to come. This makes it necessary to find alternative ways to compensate and correct the problem. We will discuss about such ways at the end of this publication or in a separate issue if space becomes a problem.

WOMEN RECEIVING HORMONE REPLACEMENT THERAPY (HRT) AFTER MENOPAUSE

Hormone replacement therapy in postmenopausal women is expected to prevent heart disease and thrombosis. Unfortunately, some inappropriate preparations with continuous use of progestins have been associated with an increased risk for cardiovascular events. This is another subject to

discuss in the future but for the current subject, we have to consider the benefits of essential fatty acids in postmenopausal women with or without HRT. It is well established that >30% of women die from cardiovascular disease after menopause and only 2% of women die from breast cancer. Proper use of bio-identical hormonal replacement affords significant health benefits to menopausal women for a minimal increase in the risk for breast cancer. Considering that consumption of fish and fish oil supplements is associated with reduced breast cancer incidence and cardiovascular disease, it makes sense to supplement all menopausal women with proper amounts of essential fatty acids whether they are on HRT or not. Proper dietary management along with scientifically proven correct hormone replacement with bio-identical hormones, can give women a second chance in life due to the vast improvement of the quality of life that can be achieved. Women can maintain many of the attributes of their youth well into their sixties and seventies. We all know that there are no miracle cures. Forget about all the books that promise you to lose weight by sitting in your couch and eat ice cream and French fries. It takes hard work, commitment, knowledge and persistence in order to use all the good habits and life style attributes that can in harmony help you achieve a long and healthy life. Unless there is a serious contraindication, bio-identical hormone replacement along with a healthy life style might be the best thing for most women.

The September issue of the newsletter will provide practical and useful information on how to correct your omega-3 imbalance. We will present information on what fish is safe to eat and what seafood to avoid. In addition, we will present information about nutritional supplements that can provide the benefits of omega-3 without the risks of the marine life's pollution.

To your Health
Alexander D. Kofinas, M.D., F.A.C.O.G