

Lipedema and Nutrition

By: Linda Anne Kahn, CLT-LANA, CDT, CMT, CN
Lymphatic Therapy Services, San Diego, CA

Lipedema, also known as painful fat syndrome, is a chronic disease of lipid metabolism. Patients have bilateral enlargement of the lower extremities with symmetrical impairment of fatty tissue distribution and abnormal fat deposition, combined with an increase of adipocytes and hormonal changes. There is increased permeability to proteins and an increased capillary fragility, which leads to an accumulation of fluids in the interstitial tissue.¹ This inherited condition occurs almost exclusively in women and usually develops during puberty. Edema can also be observed in the hips and both legs due to abnormal fat distribution, but normally the feet are spared.

The presence of excess fat causes low grade chronic inflammation to set in, which then results in chemical changes to fatty acids in the cell membranes (lipid peroxidation), disturbances in the fat metabolism and also cytokine production.^{1,2} Cytokines are proteins that the body releases in response to inflammation. Individuals with lipedema experience unexplained weight gain and this lower extremity enlargement is resistant to diet. Lipedema does not respond to normal diet plans. Many individuals have gone on low calorie diets or very restrictive dietary programs for many years, and are unaffected by this caloric restriction.

Lipedema is very often misdiagnosed as lymphedema or people are told they are “just fat” and they need to lose weight. Even after rigorous dieting, there is usually little or no loss of weight and individuals often become very frustrated, depressed,

feel hopeless and begin to overeat. A cascade of events occurs and obesity is the common complication.

Obesity further alters adipose tissue metabolic and endocrine function and leads to an increased release of fatty acids, hormones, and pro-inflammatory molecules including adipokines, leptin and cytokines, and inflammatory acute phase proteins (C-Reactive Protein), which contribute to obesity associated complications.³

In lipedema and adipose tissue there is an increase in the number of macrophages surrounding the blood vessel.⁵ These participate in inflammatory pathways that are activated in adipose tissues of obese individuals.^{4,5,6} Adipocytes are known to produce an inflammatory response and based on this fact, it is reasonable to conclude there is inflammation in lipedematous tissue, however, the exact role of inflammation in the pathogenesis of lipedema and obesity is currently unknown. In addition, the edema leads to chronic inflammation and fibrosis as a result of reduced lymph return. Rigorous clinical trials need to be conducted in this area.

According to the literature, the regulation of the fat metabolism seems to be a very complex process. There might be interaction with the nervous system, different hormones, and the microcirculation.⁵ Genetic factors may play a role as well. In addition, it is not known whether the increase of fatty tissue is caused by an increase in cell size (hypertrophy) or increase in the number of cells (hyperplasia) of the fat cells (adipocytes).¹

Diet can significantly affect the inflammatory responses within the body. There are studies showing that the Mediterranean diet could serve as an anti-inflammatory dietary pattern, which could help to fight diseases related to chronic inflammation, including metabolic syndrome. This diet consists of fruits and vegetables, nuts, olive oil, beans, legumes and fish and is moderate in alcohol and lean red meat and eliminates processed meat, refined carbohydrates and whole-fat dairy products.⁷

Essential fatty acids play a role in the body's inflammatory processes. A healthy diet contains a balance of omega 3 and omega-6 fatty acids. Omega 3 fatty acids help reduce inflammation, and some omega 6 fatty acids (soybean and safflower oil) tend to promote inflammation.⁸

Omega 3 fatty acids, (eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]), are found in high levels in fatty fish, such as mackerel, lake trout, herring, sardines, albacore tuna, wild salmon and halibut. These fish oils generally decrease several markers of inflammation.⁹ It should be noted that, unlike traditional, grain-fed livestock, grass-fed beef meat contains anti-inflammatory omega 3s and medium chain triglycerides.

Dietary sources of the omega 3 fatty acid alpha-linolenic acid include flaxseeds, chia seeds, walnuts, hemp seeds, soybeans and some dark green leafy vegetables. Omega 3 fatty acids reduce the risk of obesity and improve the body's ability to respond to insulin by stimulating the secretion of leptin,

a hormone that is expressed primarily by adipocytes.¹⁰ Leptin helps regulate food intake, body weight and metabolism.

Omega 3 fatty acids also reduce the production of the messenger chemicals cytokines, which are involved in the inflammatory response. Increased dietary intake of omega-6 fatty acids increases inflammatory markers.¹¹ The standard American diet has an imbalance of omega 3 and omega 6 fatty acids.

Vegetable oils, such as grapeseed, cottonseed, safflower, corn and sunflower oils should be avoided or greatly reduced for individuals with lipedema, as they are high in omega 6 fatty acids and are also long chain triglycerides.

Medium-chain triglycerides (MCT's) are absorbed directly from the gastrointestinal system and consumption of MCTs has been shown to increase energy expenditure and lead to greater losses of the adipose tissue in animals and humans.¹² They help to prevent and treat obesity by stimulating the process of thermogenesis. Unlike long chain triglycerides, MCT's bypass the lymphatic system and may lessen the lymph load and thus could be beneficial for lipedema patients. Coconut oil is an excellent medium chain fatty acid.¹² More clinical trials are needed to demonstrate the beneficial effects of MCT's for lipedema patients. The area of diet and its role in managing lipedema needs further research.

It is thus important for people with lipedema to avoid foods that increase inflammation. These foods include:

- Meat, dairy products and also vegetable oils, such as safflower and corn oil, as they contain saturated fats and arachidonic acid, a polyunsaturated, omega 6 long chain fatty acid.
- Foods with a high glycemic index (GI) such as potatoes, white rice, sugar and highly processed cereals that increase blood glucose and inflammation. A Cochrane Collaboration review concluded that weight loss was greater in overweight people given low glycemic load diets than in people given comparison diets, which included higher glycemic load and conventional weight-loss diets.¹³
- Processed packaged foods

- Wheat and gluten products - minimize wheat, oats, barley, spelt, rye, and kamut as they contain gluten
- Refined carbohydrates as they contain starch and have a high glycemic load and are high in sugar.
- Sugar and sugar based products - corn syrup, fructose, sugar, artificial sweeteners, chocolate
- Trans fats - found in deep fried foods, baked goods and margarine as they increase the body's inflammation levels.

It is recommended to include these anti-inflammatory foods in daily diet:

- A Mediterranean-style diet of fish, fruits, vegetables, nuts, beans, whole grains and olive oil.
- Foods high in omega-3 fatty acids, protein and fiber, such as chia seeds, avocados, olives and eat healthy fats from fish such as wild salmon, herring and mackerel, olive oils, nuts and seeds;
- Low-glycemic carbohydrates which are high in fiber - quinoa, brown rice, vegetables, beans and lentils.
- Olive, macadamia, avocado and coconut oils
- Leafy greens – Kale, collard greens, spinach, chard
- Thermogenic and anti-inflammatory herbs and spices such as ginger, turmeric, cinnamon and cumin, garlic, onions, parsley, cilantro
- Certified organic foods as much as possible, as this will decrease the toxic load on the body by eliminating pesticide, antibiotic and hormone residues.
- Cruciferous vegetables; broccoli, cauliflower, brussel sprouts, and kale, as they are rich in antioxidants.
- Free-range chickens and their eggs

Summary

Patients with lipedema have excess fatty tissue resulting in a chronic inflammatory condition. Essential fatty acids play a role in inflammation. Human studies have shown that replacing the more common dietary long-chain triglycerides (LCTs) for Medium chain triglycerides (MCT) leads to increased energy expenditure and fat oxidation¹² resulting in body adipose tissue loss. There

is a need for studies to assess the effects of this diet on lipedema and also how a vegetarian diet, gluten free diet and dairy free diet will affect lipedema.

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dkahn2@san.rr.com