When an oncologist told Helene Kelly that she had cancer, she was scared. Now she chuckles, "I didn't even know what an oncologist is." With her diagnosis, Helene learned that she has chronic lymphocytic leukemia (CLL), an incurable blood cancer, but one with symptoms that can be managed indefinitely with a battery of treatments including intravenous immune globulin therapy (IVIG).

Like Helene, many people are initially confused and overwhelmed when they learn they have cancer. Blood cancers that affect the immune system and may be incurable are especially frightening. This article will look at the role of IVIG in cancer therapy and will focus on the most common uses of IVIG: symptom management for adult blood cancers, such as CLL and multiple myeloma, and supportive therapy for pediatric leukemias and neuroblastoma.
IVIG and Cancer

Boosting the immune system is a routine part of cancer therapy, supported by the rationale that a healthy immune system can more effectively fight off the complications of infection. IVIG therapy specifically is routinely used as part of the supportive treatment for CLL and multiple myeloma.1 CLL and multiple myeloma are incurable blood cancers, but their symptoms can be managed with several therapies including IVIG, and IVIG becomes a lifelong treatment. Both of these cancers attack blood cells that are involved in fighting disease, causing them to be called “blood cancers.” Blood cancers depress the immune system and make the patient vulnerable to infection, which is where IVIG can play its supportive role.

The key to understanding the role of IVIG in blood cancers is to recognize how these cancers affect plasma cells. Plasma cells develop from B lymphocytes (B cells), a type of white blood cell that is made in the bone marrow. Normally, when bacteria or viruses enter the body, some of the B cells will change into plasma cells. The plasma cells make a different antibody to fight each type of bacteria or virus that enters the body.2 In CLL, too many lymphocytes are produced, and they can’t fight infection well. Also, as the amount of lymphocytes increases in the blood and bone marrow, there is less room for healthy white blood cells, red blood cells and platelets, which can result in infection, anemia and easy bleeding.3

In multiple myeloma, the lymphocytes successfully transform to plasma cells, but the plasma cells are abnormal. Abnormal plasma cells (myeloma cells) build up in the bone marrow, creating destruction of bone and normal bone marrow. This in turn creates a cycle where the bone marrow can’t produce the stem cells that are precursors to mature blood cells.4

CLL and myeloma primarily affect older adults with average onset in the 60s. Both cancers affect men more frequently than women. Both cause pain, fatigue and recurrent infection.5,6

Helene was 54 when she was diagnosed in 2003. She hadn’t felt right for some time, and then she experienced a terrible shingles attack that worsened despite treatment with antiviral medication. Helene was surprised when her doctor hospitalized her. She had been healthy and active her whole life. Lab tests immediately showed that she has CLL, the cause of her shingles. After a huge dose of chemotherapy that made Helene very ill, the doctor began her on IVIG to manage her symptoms. Helene switched doctors, and began seeing Dr. Robert Jacobson, the clinical research director at the Palm Beach Cancer Institute in Florida. Dr. Jacobson educated Helene about CLL and regulated her chemotherapy and IVIG treatments, making her more comfortable.

Once Helene finished her chemotherapy, she felt like a different, healthy person. Today, Helene is living well with her disease. Her lab counts have normalized, and she has much more energy. She attributes much of her renewed health to her maintenance IVIG therapy. Unfortunately, her local hospital stopped providing IVIG due to the cost, resulting in Helene missing two treatments of IVIG. She immediately contracted bronchitis that antibiotics could not touch. As soon as she resumed IVIG therapy in her doctor’s office, her health improved dramatically. Now, she receives IVIG treatments at home every 28 days, and considers IVIG a comfortable part of her routine.

IVIG and Pediatric Cancer

According to Dr. Jerry Finklestein, a pediatric hemotologist-oncologist at Long Beach Memorial Hospital in California, the state-of-the-art care for pediatric cancer is continually evolving. Ninety percent of Dr. Finklestein’s eligible patients under the age of 14 are involved in a research protocol to learn more about, and to treat, their cancer. The inherent flux in treatment protocols makes it unsurprising that IVIG has a different role in pediatric cancer than it does in adult cancers.

While some debate lingers over the most effective use

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1 www.emedicine.com/med/topic3546.htm
2 www.webmd.com/cancer/tc/Multiple-myeloma-plasma-cell-neoplasm-Treatment-Patient-Information-NCI-PDQ-General-Information
3 www.webmd.com/cancer/tc/Leukemia-chronic-lymphocytic-Treatment-Patient-Information-NCI-PDQ-General-Information-About
4 www.webmd.com/cancer/tc/Multiple-myeloma-plasma-cell-neoplasm-Treatment-Patient-Information-NCI-PDQ-General-Information
5 www.webmd.com/cancer/tc/Leukemia-Topic-Overview
6 www.multiplemyeloma.org/about_myeloma/2.04.php
of IVIG in pediatric cancer, IVIG is used primarily short-term and in a supportive role. It is used to boost the immune function of pediatric cancer patients who have thrombocytopenia (platelet depletion) that has an autoimmune component, or it is used as a supportive therapy when cancer has mandated that a child undergo a bone marrow transplant (BMT). BMT is a front-line therapy for children with acute lymphocytic leukemia (ALL) and may be an early therapy for non-lymphocytic leukemia—both blood cancers. BMT and subsequent IVIG use are particularly indicated if risks are reduced by having a sibling match.7

IVIG also plays a supportive role in stem cell transplants after intensive cancer therapy. For example, neuroblastoma is a cancer that forms in nerve tissue of the adrenal gland, neck, chest or spinal cord. It usually affects children under 5 years.8 Because it often spreads to the lymph nodes, bones, bone marrow, liver and skin, it can have significant impact on the immune system. Some children with neuroblastoma receive treatment so toxic that it destroys their bone marrow. After their bone marrow is destroyed, it is replaced with the child’s own marrow, which was collected and banked before treatment. IVIG is one part of the recovery process.

In all these situations, IVIG plays a supportive role in cancer therapy, rather than a curative role. But a rare complication of neuroblastoma provides a notable exception: Some children with neuroblastoma develop “dancing eye syndrome” (also known as opsoclonus-ataxia or opsoclonus myoclonus). Children with this complication have jerky eye movements and a wobbly gait (myoclonus). Even more significant, dancing eye syndrome can eventually have developmental and behavioral consequences.9 Dr. Finklestein explains that this may be the one area in cancer therapy where IVIG plays a curative role (in conjunction with other therapies such as ACTH, a pituitary hormone). Dancing eye syndrome seems to have an ill-defined immune component, and can be cured (or nearly cured) by treatment with IVIG.

Dr. Finklestein is banking on this treatment right now, giving one of his young patients IVIG infusions every four weeks, for six to eight months, in the hopes that her eyes will stop jerking and that she will resume walking normally.

7 For more information on bone marrow transplant, please see “Bone Marrow Transplant: A Search for Health” in the August-September 2007 edition of IG Living.
10 http://testing.duess.ca/gammacan/download/ivig_prevent_tumor_review.pdf
11 Ibid.
12 Ibid.

Conclusions

The common theme in both adult and pediatric cancers is that IVIG may be used as part of cancer therapy when the cancer or its treatment has depressed the immune system. It is rarely a cure, but it can help a cancer patient remain strong to fight the disease.

The role of IVIG in cancer therapy may be expanding. Some researchers note a relationship between autoimmune conditions that are treated with IVIG and some cancers. For example, people with Sjögrens syndrome (an autoimmune condition causing dry membranes) are more likely to develop lymphoma; myasthenia gravis patients have an increased risk of thyroma, and some myositis patients may be at increased risk for lung and ovarian cancers.10

On the other hand, some cancer patients have an increased tendency toward immune system dysfunction (as seen with blood cancers that directly affect the immune system) and autoimmune reactions. A wide variety of cancers can cause elevated autoimmune antibodies, even if patients do not develop a full autoimmune disease.11

Researchers at GammaCan International, a U.S.-Israeli company, are experimenting with the use of autoimmune antibodies in cancer treatment.12 Noting the complex relationship between immune dysfunction, autoimmunity and cancer, and the widespread effect of IVIG on the immune system, these researchers want to see if they can extend the role of IVIG therapy to treat a wide variety of metastatic cancers. If they are successful, IVIG could move from being a trusty sidekick to being a star player in some types of cancer therapy. ■

Editor's note: To contact Helene about CLL and her treatment, please direct your message to editor@igliving.com. She is happy to share her experiences and to offer support to others with CLL.