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Treatments for Alopecia

Alopecia is a life-altering, not life-threatening disease. This is a phrase commonly used to describe Alopecia because many people mistake this disease for cancer, but Alopecia is nothing like cancer. Out of all of the emotional and physical effects, the unpredictability of this disease can sometimes cause the most pain for patients. I have had Alopecia for about 6 years now. One day I would start seeing new growth and another day I would find a bald patch. But, after discovering different treatments that worked for me, I was able to grow all of my hair back. There are many different treatments for Alopecia but none of them are guaranteed to work because every person is different. Many treatments have been deemed successful for Alopecia patients, including different injections and pills, immunotherapy, and topical ointments. While these treatments work for some, they do not pose as a cure. However, a new study was just released that has had a lot of success. Researchers identified the specific gene in the immune system that causes Alopecia. After doing this, they determined that a bone marrow pill could reverse the gene. Though there are many treatments that have helped with new hair growth for Alopecia patients, the new bone marrow drug has shown to be superior because it’s not painful, the treatment isn't time-consuming and it has been continuously successful.

Alopecia is an autoimmune disease where the body’s own immune system cells attack the hair follicles, causing them to fall out. This process normally begins with the thinning of hair,

usually in patches, and can progress to the lose of all of the hair on one’s body. There are three different types or stages of Alopecia: Areata, Totalis, and Universalis. Alopecia Areata is the most common type, which consists of loosing patches of hair anywhere on the body. Totalis is the lose of hair on the scalp, while Universalis is the lose of hair on the entire body. Alopecia affects men and women of all ages. “AA affects about 5.3 million people in the United States alone, including males and females across all ethnic groups, with a lifetime risk of 1.7%” ([Petukhova](http://www.ncbi.nlm.nih.gov/pubmed/?term=Petukhova%20L%5Bauth%5D)). This disease impacts many people, yet there is still no cure.

A surprising factor to Alopecia is even after the lose of hair, the hair follicles still remain alive; so one could find a treatment that triggered new growth or the hair could grow back on its own. The problem that will sometimes emerge is that the hair won’t grow back at all or that it never grows back on its own. One of the most common treatments known for Alopecia patients are cortisone injections. The National Alopecia Areata Foundation explains the injections and states that, “The injections are usually given by a dermatologist who uses a tiny needle to give multiple injections into the skin in and around the bare patches. The injections are repeated once a month” (NAAF). Knowing from experience, a patient can get anywhere from ten to eighty of these painful shots in their head. In one article, the UBC Hair Clinic was mentioned for using the steroid injections on Alopecia patients, “The nurse performs intralesional cortisone injections and administers the topical immunotherapies. The medication used for the intralesional injection used is triamcinolone acetonide 5 mg/ml administered every 4 to 6 weeks.” (MacDonald). Though this treatment may be fairly successful, there is a risk of skin atrophy from the injections. This undesirable side effect could appear whenever topical or injected steroids are used on someone.

The bone marrow drug is more impactful than this treatment because of the side effects, pain, and uncertainty that goes along with the steroids.

Another known treatment for Alopecia is diphenylcyclopropenone, mainly known as DCPC. This topical immunotherapy is mostly used for patients with Totalis or Universalis because there is a larger area to treat. Only one half of the scalp is treated at first to make sure that the agent is effective. Once hair starts to grow, the other half is treated. MacDonald describes the purpose of the drug and states, “The objective of treatment is to induce a low grade allergic contact dermatitis by initially sensitizing the patient, and then applying very weak concentrations of the compound directly to the scalp once a week” (MacDonald). If new growth is established, then the treatment is decreased. The problem with this treatment is the chance for relapse. The average success rate is 58%, which sounds good, but the UBC Hair Clinic researched the relapse rate. Researchers found that, “Research on the relapse rate is in progress, but there is little information available. In our experience, about 40% of patients relapse on treatment” (MacDonald). There are also some side effects that can go along with this drug, including; rashes, pigment changes, and peeling of the effected area. Compared to the bone marrow pill, this treatment is more time consuming and can cause skin irritation, while the new drug seems more practical.

In the new bone marrow study, researchers have narrowed down and identified the specific immune cells that are involved with this process. Raphael Clynes and Angela Christiano led this research at the Columbia University Medical Center in New York. They have found that the CD8+NKG2D+ T cells stimulate the the hair lose. Starting out as a laboratory mouse study, this research soon developed into something more. During trials on the mice, they had much

success in regrowing the lost hair. This proceeded into the trials on humans to determine if it would have the same success rate. Clynes and Christiano then test their theory on 3 human samples to try and reverse the cells like they had done in the mice trials. These patients were given the pill once each day for about five months, which resulted in full regrowth of hair. This research was posted in the Nature Medicine Journal. In the journal article, the authors present, in the abstract, a breakdown of the research that was completed. “Here, we show that cytotoxic CD8+NKG2D+ T cells are both necessary and sufficient for the induction of AA in mouse models of disease. Global transcriptional profiling of mouse and human AA skin revealed gene expression signatures indicative of cytotoxic T cell infiltration” (Xing). The researchers strived to further the information known on this disease, specifically the T cells, and to ultimately find a cure.

The bone marrow drug is becoming exceedingly superior to the other treatments that are currently being used on Alopecia patients because it is not painful, the treatment isn't time-consuming and it has been continuously successful. Though this drug isn't FDA approved yet, the researchers are conducting several more trials to ensure that this drug is 100% effective. In comparison to the steroid injections, this drug is painless. All patients have to do is take the pill once a day for three to five months. Unlike some topical treatments, where you sometimes have to go see a doctor to get, this drug would be easy for patients to take because it is in the form of a pill. Though there hasn't been many trials so far, the success rate is very high. In the three people who have tested this drug, each one has resulted in full regrowth of hair, but because the researchers only have three sample, they feel that they don't have any solid conclusions about the drug yet.

The results of this study show the effectiveness of the bone marrow drug. The Nature Medicine Journal explains the success of this drug. “Notably, three patients treated with oral ruxolitinib, an inhibitor of JAK1 and JAK2, achieved near-complete hair regrowth within 5 months of treatment, suggesting the potential clinical utility of JAK inhibition in human AA” (Xing). These are great and promising results for a disease that has seen very little progress towards a cure. Though there has been many advancements with this drug, researchers still have more research to do. A PubMed Health article suggests for people to not get their hopes up. “However, it is important to realize that this research is in the very early stages. So far ruxolitinib treatment has been tested in only three people with alopecia, which is far too small a number to make any solid conclusions about the effectiveness or the safety of this treatment in people with alopecia” (Barzian). Though the results of this research have been successful so far, there are still many things that need to be found about the drug.

Alopecia has effected people for years, but now there is hope for these patients. The new bone marrow drug has shown to be very successful in the trials so far. Because of all of this new research being done, Alopecia is finally getting the attention it deserves. This is the closest researchers have ever gotten to finding a cure. The treatments before this were successful in some cases, but there was no guarantee because every patient is different. Unlike the bone marrow drug, some of the other treatments have been found to be painful, time-consuming, and unsuccessful. Researchers still have a ways to go with this drug, but now there is hope that people suffering from this disease might not have to be suffering for much longer.

Citations

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