Side Effects of Stem Cell/Bone Marrow Transplantation [1]

This section has been reviewed and approved by the Cancer.Net Editorial Board [2], 11/2013

Key Messages:

- The possible short- and long-term side effects of a stem cell transplant depend on the type of transplant and vary from person to person.
- The chemotherapy and/or radiation therapy given before stem cell transplantation and anti-rejection drugs that help prevent a patient?s body from rejecting donated stem cells weaken the immune system, increasing the risk of infection.
- People who have a transplant that uses stem cells from another person are at risk of developing graft-versus-host disease, a potentially harmful side effect.
- It is important to tell your health care team about any side effects you experience after the procedure or any changes in symptoms so they can be managed.

Although a stem cell transplant (sometimes called a bone marrow transplant) is an effective treatment for several types of cancer, it can cause a number of different side effects. The type and intensity of these side effects vary from person to person and depend on the kind of transplant performed, the person's overall health, and other factors. Your health care team will work with you to prevent side effects or manage any that occur. This is called palliative or supportive care [3] and is an important part of your overall treatment plan. Be sure to talk with your health care team about any side effects you experience, including new symptoms or a change in symptoms.

The two most serious side effects of stem cell transplantation are infection and graft-versus-host disease.

Infection

The chemotherapy [4] and/or radiation therapy [5] given before a stem cell transplant weakens a person?s immune system, lowering the body?s defenses against bacteria, viruses, and fungi. That means stem cell recipients are especially vulnerable to infection [6] during this early period of treatment.

Although most people think the greatest risk of infection is from visitors or food, most infections

that occur during the first few weeks after a transplant are caused by organisms that are already in the patient's lungs, sinuses, skin, and intestines. Fortunately, most of these infections are relatively easy to treat with antibiotics.

The reduced immunity of the early transplant period lasts about two weeks, after which the immune system is back to near full strength and can keep most common germs at bay without the help of medications. This is true for both autologous (AUTO) transplant recipients (who receive their own stem cells) and allogeneic (ALLO) transplant recipients (who receive stem cells from another person).

However, a risk of serious infection remains for ALLO transplant recipients because they are given anti-rejection drugs. These drugs suppress the immune system to prevent the body from rejecting the donor?s stem cells. However, this low immunity also leaves the body more at risk for infection. This risk increases when more anti-rejection drugs are needed. Your treatment team will work with you to prevent and manage infections.

Graft-versus-host disease

People who have an ALLO transplant are also at risk of developing a post-transplant illness called graft-versus-host disease (GVHD). It occurs when the transplanted stem cells recognize the patient?s body as foreign and attack it, causing inflammation. GVHD ranges from mild to life-threatening. AUTO transplant recipients do not face this risk because the transplanted stem cells come from their own bodies.

Fortunately, doctors have medications that can prevent the development of GVHD. Every patient, even people who receive stem cells that are 100% matched, is given preventive anti-rejection medications during the first three to six months after the transplant. If GVHD still develops, the patient is then treated with more anti-rejection medicines.

GVHD at its worst can be fatal. However, in moderation, GVHD can be lifesaving because the transplanted cells have the ability to recognize and destroy any cancer cells that may still be in the body. Therefore, mild GVHD can ultimately cure the patient. In fact, this is the primary way ALLO transplantation cures cancers like leukemia.

There are two types of GVHD, both of which can occur with varying degrees of severity:

Acute GVHD. This form of the disease typically occurs within the first three months after an ALLO transplant and often affects the skin, intestines, and liver. Patients develop rashes, diarrhea, and jaundice (yellowing of the skin and the whites of the eyes) as each organ system is affected. Treatment consists of medications that block T cells (a type of white blood cell that helps the body?s immune system fight infection).

Chronic GVHD. This form typically occurs more than three months after an ALLO transplant, and it can last a few months or a lifetime. It may not produce any symptoms or require treatment. However, it may become a source of health problems that need regular medical attention and treatment. Symptoms may be mild (including dry eyes, dry mouth, and blood test abnormalities that indicate a slightly irritated liver) or more severe (including loss of skin elasticity, known as scleroderma; muscle and joint pains; weight loss; infection; and difficulty breathing).

Other common side effects

Almost any part of the body has the potential to be affected in some way by the stem cell transplantation process. Doctors will monitor a patient's recovery using a variety of tests that look for change in the kidneys, lungs, heart, and other organs. Other side effects that may occur during a transplant, often related to the destruction of the original bone marrow, chemotherapy, or radiation therapy include:

- Fatigue
- Mouth sores
- Sore throat
- Diarrhea
- Nausea and vomiting
- Low blood count
- Loss of hair
- Changes in skin pigmentation
- Rash
- Cataracts (a clouding of the lens of the eyes)
- Sexual side effects
- Infertility (the inability to become pregnant or have children)

The amount, type, and severity of side effects depend on the patient?s health, the amount of previous treatment, and the type of transplant received. These side effects can usually be managed through medication and may go away over time. However, there is a risk of some permanent side effects from a stem cell transplant, such as infertility [7] and cataracts. Talk with your doctors about the possible short-term and long-term effects you may experience before having a transplant.

More Information

What is Stem Cell / Bone Marrow Transplantation? [8]

Managing Side Effects [9]

Coping With the Fear of Treatment-Related Side Effects [10]

Donating Bone Marrow [11]

Additional Resources

Explore BMT: About Transplant [12]

National Bone Marrow Transplant Link: Survivorship Guide for Bone Marrow/Stem Cell Transplant [13]

Be the Match: Guidelines for Long-Term Follow Up [14]

Links:
[1] http://www.cancer.net/navigating-cancer-care/how-cancer-treated/bone-marrowstem-cell-transplantation/side-effects-stem-cellbone-marrow-transplantation
[2] http://www.cancer.net/about-us
[3] http://www.cancer.net/node/25282
[4] http://www.cancer.net/node/24723
[5] http://www.cancer.net/node/24728
[6] http://www.cancer.net/node/25256
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[12] https://explorebmt.org/Content/Sections/About_Transplant/About_Transplant.aspx
[13] http://www.nbmtlink.org/resources_support/spg/index.htm
[14] http://bethematch.org/For-Patients-and-Families/Life-after-transplant/Guidelines-for-long-term-care/