



HOW STEM CELL THERAPY HELPS AUTISM CASES





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INTRODUCTION

Did you know...

...autism now affects 1 in 68 children and 1 in 42 boys?

Autism is a neurological as well as a developmental disorder, hence the symptoms occur early in childhood and last for a lifetime. It is now referred to as Autism Spectrum Disorder (ASD).

The cause for ASD is unknown. There is a theory that considers ASD a genetic condition. Another theory postulates that it may be associated with autoimmune diseases related or unrelated to vaccines. In either case, neurophysiological and neural hypoperfusion abnormalities are a constant. There are certain environment factors, diet and lifestyle factors that may aggravate the condition.

The cognitive condition may vary from extremely gifted to severely challenged. Since there is such a wide range of symptoms, it is very easily overlooked or over diagnosed.

HOW STEM CELL TREATMENT CAN HELP

Did you know...

...autism costs a family \$60,000 on average per year?

Recent studies suggest that ASD may be associated with autoimmune disorders. Stem cell therapy has been used for a variety of autoimmune conditions such as sclerodermia, lupus and Chron's Disease. As mentioned above, stem cells have immune-modulating properties and have been used in about 10 clinical trials for ASD treatment. Some patients have shown benefits from treatment but more scientific evidence needs to be collected.

ASD stems from dysfunctional neurons, a decreased blood supply to the affected area of the brain and auto-immune process. Stem cells can help in all three areas as the combination of hematopoietic and mesenchymal stem cells could stimulate the formation of functional neurons, increase blood flow by formation of new vessels and control the autoimmune process.



PATIENT PREPARATION

Did you know...

...boys are nearly five times more likely than girls to have autism?

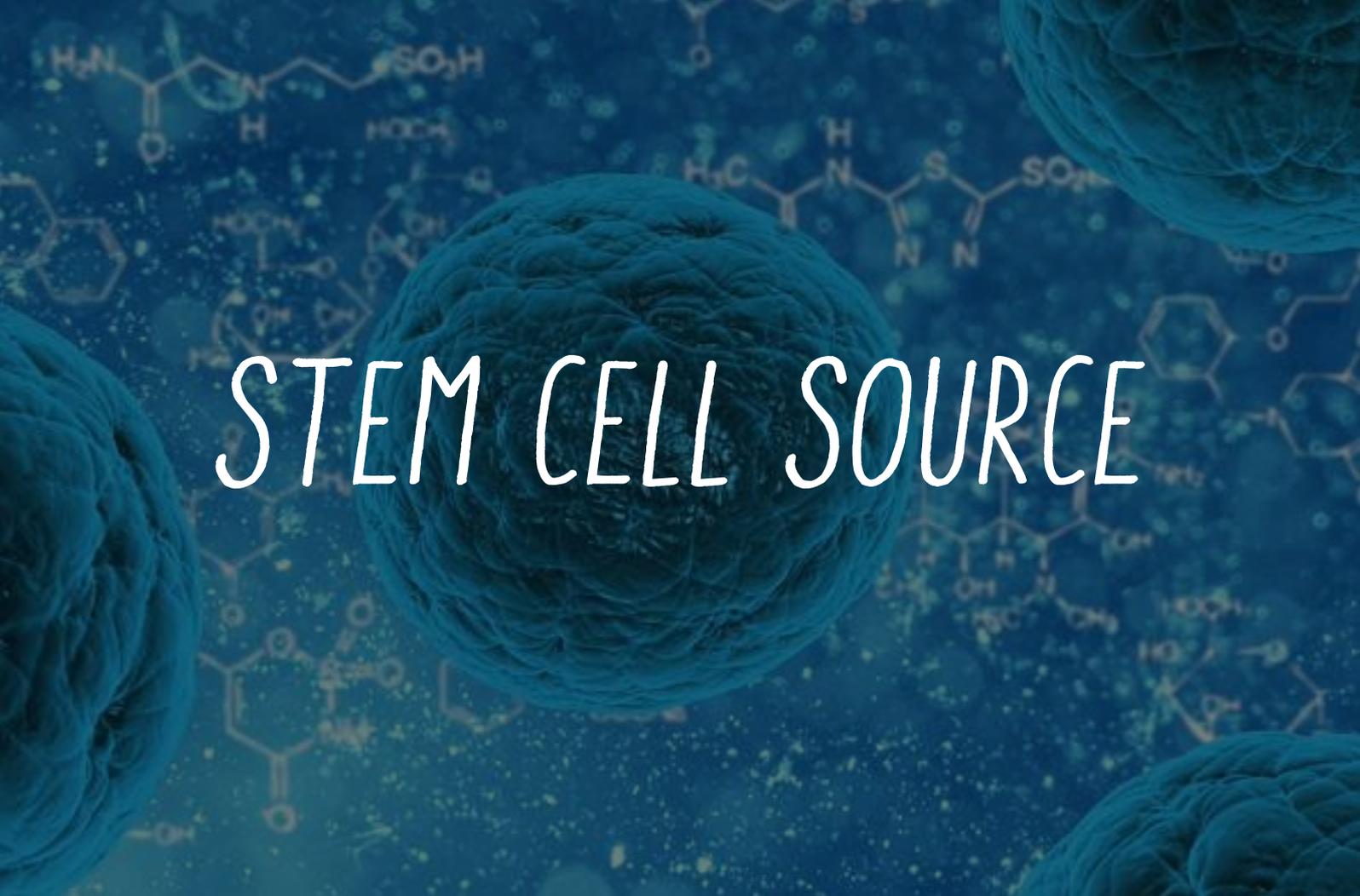
...there is no cure or medical detection for autism?

The patient is brought in for thorough evaluation prior to transplantation. The patient meets with a transplant expert who will review his/her medical record, discuss the treatment options and procedures, and will answer any questions that may come with.

A psychological evaluation is carried out by a neurologist to see how the patient is dealing with daily activities and qualify as a candidate for this kind of therapy. If there are psychological concerns a deeper evaluation is ordered.

If a patient is suffering from pain and inflammation, they will be administered respective medicines to relieve the symptoms before beginning therapy. A proper drug history is also very important as there are certain medicines that must be stopped at least a week before any procedure, for example blood thinners.

It is always a good idea for the body to be replenished continuously by nutrients like vitamins and minerals. Intravenous infusions or special diet may be recommended by a nutritionist or by your family doctor.

A graphic showing several blue, textured spheres representing stem cells against a dark blue background with faint chemical structures. The text 'STEM CELL SOURCE' is written in a white, serif font across the center.

STEM CELL SOURCE

Did you know...

...autism doesn't affect only children?

...autistic children grow up to be autistic adults?

In the case of autism, the use of bone marrow as a source of hematopoietic and mesenchymal stem cells has been supported through the evidence collected from research and clinical trials. These stem cells possess the ability to differentiate into cells with ectodermal origin, such as neurocytes, and they also consist of immune-modulatory characteristics, i.e. they can regulate the micro environment in the host tissue.

Another good source of stem cells is the adipose tissue. Since most patients with autism are children, it is not recommended to perform a mini liposuction in children. It is very aggressive, fat layer is thin and risks are higher; therefore adipose tissue is not the preferred source.

Hematopoietic stem cells are commonly harvested from bone marrow. Allogenic stem cells are not recommended due to host-donor cell rejection reaction.

If the patient has properly-stored stem cells from their own umbilical cord, then it could be a viable source of stem cells for stem cell therapy for autism.



HOW STEM CELLS ARE ADMINISTERED

Did you know...

...autism is a hidden disability – you can't always tell if someone is autistic?

...the right support at the right time can make an enormous difference?

To avoid any damage to the stem cells, minimal manipulation of the bone marrow is necessary. Once the bone marrow is harvested, the specimen is divided in two parts: One part is combined with saline and other cell support reagents while the second part is concentrated to remove red cells and plasma as much as possible. In this process all captured stem cells inside these components are spinned out into a buffer layer. This layer will be combined with a small volume of plasma obtaining a 1ml-3ml concentrated dilution of stem cells.

Since most of the patients with autism are children, and they can be easily scared by needles, light sedation is recommended. The patient is asked to be at the procedure room early in the morning before any meal. Fasting will enable better tolerance to light anesthesia.

After the patient is sedated, an IV will be set and then the procedure of bone marrow aspiration will begin.

The best results have been obtained when one part of the specimen is infused by IV into the blood stream to regulate the immunological effects and the concentrated part of it infused by intrathecal route to get into the spinal fluid to flow up to the brain and stimulate the brain barrier and neurons.

A young child with light brown hair is holding a white sign with the word "eyes" written on it. The child is also holding a small yellow card with a picture of a pair of eyes. The background is a blurred indoor setting.

RISKS AND SIDE EFFECTS

Did you know...

...34% of children in the autism spectrum say that the worst thing about being at school is being picked on?

Some side effects of the bone marrow aspiration could be:

- Soreness and/or swelling in the following three days.
- After an intrathecal infusion there could be signs of soreness or redness. The risk involved in an intrathecal infusion is related to a bad positioning by an inexperienced doctor.
- A needle puncturing other tissues can produce inflammation, damage to nerves that can lead to other disabilities.
- Besides the common side effects of an IV and the intrathecal infusion, side effects from the light general anesthesia or sedation are also present:
 1. Children can develop a reaction to the anesthesia.
 2. After the procedure the patient may experience confusion, nausea or dizziness.
 3. The patient will be tired and could sleep for many hours after the procedure.

A young boy with brown hair is looking down at a monarch butterfly he is holding in his hands. The background is a soft-focus green, suggesting an outdoor setting with foliage.

SCIENTIFIC RESEARCH BEHIND STEM CELL TREATMENT FOR AUTISM

Did you know...

...autism is among the fastest-growing developmental disorders in the U.S.?

Scientific research for further review:

- **Perspectives on the Use of Stem Cells for Autism Treatment.**
Stem Cells Int. 2013;2013:262438
Authors: Siniscalco D, Bradstreet JJ, Sych N, Antonucci N
- **Transplantation of human cord blood mononuclear cells and umbilical cord-derived mesenchymal stem cells in autism.**
J Transl Med. 2013;11:196
Authors: Lv YT, Zhang Y, Liu M, Qiuwaxi JN, Ashwood P, Cho SC, Huan Y, Ge RC, Chen XW, Wang ZJ, Kim BJ, Hu X
- **Stem cells as a good tool to investigate dysregulated biological systems in autism spectrum disorders.**
Autism Res. 2013 Oct;6(5):354-61
Authors: Griesi-Oliveira K, Sunaga DY, Alvizi L, Vadasz E, Passos-Bueno MR
- **Therapeutic role of hematopoietic stem cells in autism spectrum disorder-related inflammation.**
Front Immunol. 2013;4:140
Authors: Siniscalco D, Bradstreet JJ, Antonucci N