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Short Communication

Plasma Therapy Gains Attention in Treatment of Viral Infections, Dermatological Illness, and Orthopedic Illnesses

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Summary

Plasma therapy is one of the major chapters in medicines. Convalescent plasma therapy, another term for plasma therapy involves the use of blood from a person who has recovered from a particular illness to help others who are suffering from the same disease. The plasma of this blood is likely to contain antibodies that can help other patients fight the same illness, especially if viruses or pathogens are compromising the immunity system. Plasma therapy speeds up the recovery and helps manage symptoms. Moreover, it is used in wound healing, face rejuvenation, and androgenetic alopecia. It can help patients suffering from Covid-19, which increased its demand since the Covid-19 outbreak.

According to Allied Market Research, the global plasma therapy market is expected to reach $698.46 million by 2030, growing at a CAGR of 8.5% from 2021 to 2030. The rise in the geriatric population and prevalence of rare diseases, the surge in the number of androgenic alopecia patients, and the increase in the number of plasma collection centers have boosted the growth of the market. In addition, a rise in patients suffering from neurological disorders such as chronic inflammatory demyelinating polyneuropathy (CIPD), multifocal motor neuropathy (MMN), and idiopathic thrombocytopenic purpura (ITP) boosted the demand for plasma therapy.

How does plasma therapy work?

In plasma therapy, the donated blood is carefully processed to remove blood cells to extract only the liquid part or plasma and the antibodies. This plasma is injected into patients who are suffering from the same illness and helps them recover from their illness.

The goal of plasma therapy is to offer passive immunity, a short-term immunity that involves the introduction of antibodies from another person. Healthcare professionals give convalescent plasma to patients who have severe illness and whose immune system has not responded to the disease as they never had the illness before. On the other hand, a person who donates the convalescent plasma had already recovered from the same illness and has antibodies that need to kill the pathogen that causes the disease. After receiving the convalescent plasma, the antibodies in the plasma bind to the pathogen or virus causing the illness and dramatically reducing the virus entering into cells and reproducing.

Plasma therapy is considered to be very safe and used to treat conditions that may cause lung damage, a variety of allergic reactions, and infections such as HIV and hepatitis B and C.

If one is vaccinated against a pathogen, the body takes two to three weeks to form antibodies against it. On the other hand, providing antibodies through plasma therapy has the benefits such as preventing illness, reducing the severity of the disease, and shortening the length of hospitalization.

The Covid-19 outbreak suddenly increased the demand for plasma therapy, due to a surge in the number of people suffering from Covid-19, lack of proper treatment and medication, and severe infection and damage to lungs that could be treated with plasma therapy. It was widely recommended in the treatment of Covid-19 patients as it was observed to shorten the hospitalization time of patients. However, some studies concluded that the use of plasma therapy for Covid-19 is ineffective in reducing the progression to severe illness and even death in patients.

What are the benefits of plasma therapy?

The use of plasma therapy is proven to be effective for back pain, dermatological illnesses, and several other diseases. The therapy is much safer than other treatments including monopolar therapy. It causes less thermal damage and bleeding during the procedure and causes less discomfort or pain after the operation. In addition, plasma therapy reduced the hospitalization period drastically. The plasma therapy poses no risk of transurethral resection (TUR) syndrome as well. As there are fewer chances of side effects, the recovery time is much faster compared to other treatments. Plasma therapy offers long-lasting results and, in some cases, it allows the patient to discontinue medication after the surgery.

Plasma therapy and dermatological illnesses

Platelet-rich plasma (PRP) therapy gained tremendous popularity over the years for dealing with dermatological diseases. The treatment was popularized as “vampire facial” as it uses plasma from the patient’s blood to stimulate skin cell regeneration in the applied area. This skin treatment was not a short-term trend but offered various skin care and hair care benefits.

The PRP therapy is completely natural as it uses the patient's blood plasma to be injected into the desired areas rather than using chemicals. People who are concerned about injecting foreign chemicals and substances prefer PRP therapy. In addition, the procedure is minimally invasive and requires short sessions to the entire course of treatment. PRP therapy is beneficial for treating acne scarring and hair regeneration. Treating acne has always been a painful procedure and it can lead to scarring. However, PRP therapy proves to be effective in diminishing the look of acne scars. On the other hand, the treatment can help stimulate hair growth cells and produce thicker hair over time.

PRP therapy is rapidly used for rejuvenating tired eyes. The increased collagen from PRP therapy is effective for adding volume to facial areas such as under the eye circles which help rejuvenate tired eyes.

The prime reason behind the popularity of plasma therapy is little to no risk of side effects as it uses the body's own blood as part of treatment. Another benefit of the use of plasma therapy is to treat wrinkles and fine lines. Studies show that plasma therapy can significantly minimize the wrinkles and fine lines and help give a youthful look without undergoing major, invasive surgery.

Plasma therapy to treat back pain

When it comes to back pain, patients look for long-term treatment and the use of plasma therapy for the treatment of back pain is somewhat rare than its use in dermatology purposes. PRP injects can treat back pain and sacroiliac (SI) joint pain. This therapy is also called Orth biologic injection-based therapy and has been studied for knee osteoarthritis. Now, researchers have expanded their study to treat other joints, especially in the spin. Several research studies showed that PRP therapy can offer long-lasting benefits than the use of steroids which only last for a few weeks. On the other hand, PRP therapy has fewer risks and side effects and a safer course of treatment for continuous use.

The use of PRP therapy for the treatment of back pain gained special attention. It is observed many patients with back pain are misdiagnosed. SI joint pain is a major cause of back pain which often is attributed to sciatic nerve pain or something other. However, PRP therapy for these patients and patients with a history of back surgery or spinal fusion can be fruitful. The therapy could last for six months to a year. Some patients showed positive feedback to the plasma therapy for more than two years. The use of steroid injections may offer temporary relief, but PRP therapy can not only offer long-term pain relief but also improve function for daily activities. What's more, PRP therapy can work for patients of all age groups.

Plasma therapy for orthopedic illnesses

The use of plasma therapy to treat orthopaedic conditions has been one of the rapidly evolving branches of science. Several research studies show that PRP is a promising method to treat soft tissues as well as bone-related injuries.

Autologous PRP has been used for treating several serious conditions that include tendon, muscle, bone, and ligament. As the cells from the patient's own body are utilized to the targeted areas of injury, PRP is proven to be the safest and most effective method of treatment. Moreover, PRP therapy includes faster recovery time, increased range of motion, improved strength, decreased inflammation, and less pain.

For tissue healing, platelets are vital. They are formed in the bone marrow and contain 30 bioactive proteins that are essential for tissue healing. Growth factors and proteins secreted from platelets are proven to play a major role in tissue healing. The effectiveness of PRP depends on the release of multiple growth factors and how they interact with the body. PRP contains proteins that act as adhesion molecules that help in healing tissue and promote healing in the targeted area of injury.

Several chronic conditions have undergone clinical trials when it comes to the use of plasma therapy for treatment. These conditions include Achilles tendinopathy, rotator cuff injury, anterior cruciate ligament injury, and lateral epicondylitis.

Apart from this, PRP therapy is gaining tracking in treating degenerative diseases. Regenerative medicine involves a process of creating functional, living tissues to replace or repair organ functions or tissues that are lost owing to age, damage, disease, or congenital defects. The regenerative medicine treatments are still new and are not cures or alternatives for surgery. PRP therapy has been bringing positive results in regenerative medicine treatments.

Plasma therapy for Covid-19 treatment

The Covid-19 outbreak was one of the unprecedented disasters in the world. The Covid-19 virus attacked the respiratory system and crippled the immune system. The spread of Covid-19 put pressure on the healthcare sector due to lack of medicines, equipment, and, in developing and underdeveloped countries, lack of infrastructure. Plasma therapy was initially recommended in the treatment of Covid-19 as it was observed that it can shorten the hospitalization period if administered within the first two-three days of symptom onset.

Similar to other plasma therapies, blood plasma from recovered Covid-19 patients was taken and given to patients with Covid-19 to boost their immune systems and ability to fight the virus. While some patients showed a positive response to the plasma therapy, healthcare experts stated that the therapy is not effective in reducing progression. Moreover, some studies indicated that the use of plasma therapy can foster the emergence of more virulent strains of Covid-19. Thus, many countries dropped the use of plasma therapy for the treatment of Covid-19. Multiple research facilities studied the success of the use of plasma therapy for the treatment of Covid-19 and stated some of the risks associated with it. One of the major risks of the therapy is the transfer of blood substances which can take place during the blood transfusion and may lead to infection. In many cases, the therapy might fail and instead enhance the form of infection. The plasma therapy for the Covid-19 patient may end up suppressing the patient's natural immune system, which may leave the patient susceptible to subsequent re-infection.

While the risks associated with the use of plasma therapy are troubling, it is not the first time the treatment is used for treating viral infection. Prior to this, plasma therapy has been used to treat Ebola virus disease, Middle East respiratory syndrome (MERS), H1N1 influenza virus, and many other serious outbreaks that have happened in the past.

Each virus and disease is different and each person is unique. Thus, finding a cure for novel viruses is always a painstaking job. Thus, plasma therapy offers a solution until there is a cure for the new virus. Having said that, plasma therapy may not benefit some people but prove to be effective on others. There are several studies going on just to prove how effective convalescent plasma therapy is and how it can be used in regenerative diseases and other illnesses. Thus, the funding in R&D to study the effects of plasma therapy has increased over the last few years. The Covid-19 pandemic surely benefited the global plasma therapy market even though various medical authorities no longer recommend the therapy.

Apart from viral infections, plasma therapy is proven to be effective in cosmetic surgeries that are gaining popularity in developed countries. As plasma therapy is safer and relatively less painful, the inclination toward the use of the therapy for skin treatment has increased drastically. Convalescent plasma therapy and platelet-rich plasma injections are exciting new treatment options in the medical sector. Although the treatment needs the support of clinical trials for its widespread use, they are proven to be effective for treating chronic illnesses. Thus, in the

future, the healthcare sector will not ignore the benefits of plasma therapy and even include them as a method of treatment for novel viral infections or during outbreaks.

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