

Autologous Hematopoietic Stem Cell Transplant: *Hope for patients with multiple sclerosis!*

Multiple sclerosis (MS) is a severely disabling, incurable disease, wherein the patients' own immune cells attack the protective coating of nerves in the brain and spinal cord. This causes problems with vision, limb movements, balance and ability to walk, thus severely compromising the quality of life, with the patient progressing towards prospective disability. The average life expectancy is also slightly reduced. Usually, drugs are used to kill these 'rogue' immune cells in an attempt to stop their attack. While this might help mitigate the situation to an extent in the short term, relapses are very common. Better alternatives are therefore strongly desirable. Approaches like the use of hematopoietic stem cell transplant (HSCT), have been thought to hold promise in addressing this issue, since it has the ability to reset the immune system, thus potentially being capable of ridding the body of immune cells that have gone awry and replacing them with healthy cells.

Preliminary findings of a recent study reported in *JAMA Neurology*¹ have shown that autologous hematopoietic stem cell transplant (AHSCT) can indeed help MS patients to live in a disease-free condition over longer periods, even though this therapy is quite aggressive. These clinical trials have been one of the largest and longest investigations of the use of such a treatment for MS. In AHSCT, hematopoietic stem cells are withdrawn from the patient's blood and bone marrow, and are later re-infused / reintroduced into their bodies after completely destroying the immune cells in the patient's body using chemotherapeutic drugs. These healthy hematopoietic stem cells, which have the ability to produce all types of blood cells, then give rise to new healthy immune cells, thus restoring the immune system. The patients in this clinical trial received either AHSCT or conventional drug therapy. An interim analysis during the trial showed that patients in the group that received the stem cell transplant experienced a reduction in disability, whereas the symptoms worsened in the group of patients that received drug treatment. One year following treatment, relapse occurred in only one patient among the AHSCT group, as compared with 39 patients in the drug group. In a follow-up after three years, the transplants were found to have failed in fewer patients, i.e. three out of fifty two patients (6%), as compared with thirty out of fifty patients (60%) in the control group that received the drug treatment. The AHSCT therapy has been successful in preventing the disease from progressing in some patients for at least 5 years so far.

It is not surprising, therefore, that this has captured the attention of the media^{2,3,4,5} recently, with the success of this therapy being exemplified in MS patients like Louise Willetts, who has seen her severe symptoms disappear, and has been able to start a family two years after receiving this treatment. These findings, which were presented at the annual meeting of the European Society for Blood and Bone Marrow Transplantation a few days ago, are yet to be published in a peer-reviewed journal. While the patients in whom this therapy has worked well so far have cause to rejoice, doctors stress that it is not suitable for all MS patients - the process involves aggressive chemotherapy, requiring a few weeks in isolation in hospital, and can be gruelling. Such chemotherapy comes with its own high risks, including the possibility of succumbing to fatal infections. However, given that the benefits seem to have outweighed the risks in many patients in clinical trials so far, receiving AHSCT could potentially prove life-changing in the future, especially for patients with aggressive, drug-resistant MS, provided this therapy is improved further and used wisely.

1. <https://jamanetwork.com/journals/jamaneurology/article-abstract/2604135?redirect=true>
2. <http://www.bbc.com/news/health-43435868>
3. <http://www.bbc.com/news/av/health-43437712/game-changer-treatment-for-multiple-sclerosis-patients>
4. <https://www.telegraph.co.uk/science/2018/03/19/stem-cell-treatment-offers-new-hope-multiple-sclerosis-patients/>
5. <https://www.independent.co.uk/news/health/multiple-sclerosis-stem-cell-transplant-clinical-trial-ms-symptoms-improvements-sheffield-chicago-a8263126.html>

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V. P. Kale, J. Rao

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