

Crohn's Disease



Autoimmune/Inflammatory | Bone Marrow, Peripheral



The exact cause of Crohn's disease remains unclear, but a genetic predisposition and environmental factors including possible microbiological infection are considered the most likely combination. The result is an excessive quantity of Tumour Necrosis Factor (TNF) produced that indiscriminately kills all gut floras. Without the normal gut flora, food digestion is compromised.

New cases of Crohn's disease are diagnosed at a rate of 7 per 100,000 people. It usually arises in those aged between 16 and 30 years of age, or between 60 and 80 years of age. It is more prevalent in women than men, in white than black or Asian people, and is most common in people of European Jewish descent. Currently 90,000 people are living with Crohn's disease in the UK at a cost of £1,652 per patient per 6-month period.

Clinical Trials

A clinical trial at Nottingham is underway, which completed recruitment in June 2012. This uses stem cells mobilised from bone marrow. There are four further clinical trials, one using peripheral blood stem cells, two using cultured stem cell lines and a third using allogeneic stem cell transplantation.

There has also been further work using adipose-derived stem cells to treat fistula complications arising due to Crohn's disease. This reported a 69.2% reduction in fistula draining events and 56.3% complete closure rate, with 30% complete closure of all existing fistulas.

Patient Studies

One study has been undertaken using autologous bone marrow-derived mesenchymal stem cells (MSC) at a dose of 1-2 x 10⁶ cells per kg bodyweight. A French study used peripheral blood-derived MSCs to treat patients, with some success but numbers were small. These led to the current clinical trial being proposed.

Future Work

Due to the inflammation caused by the autoimmune response, the role of MSCs could be critical in the moderation of the immune response in this disease.

Summary

The proposed clinical trial will provide more data understanding about this disease and the potential to treat it with haematopoietic stem cells.

References

<http://www.nhs.uk/Conditions/Crohns-disease/Pages/Causes.aspx>

<http://europepmc.org/articles/PMC1774248>

<http://www.nottingham.ac.uk/scs/divisions/nddc/astic/astictrial.aspx/>

<http://www.sciencedaily.com/releases/2011/03/110330214716.htm>

<http://www.ncbi.nlm.nih.gov/pubmed/20921206>

Gut. 2010 Dec;59(12):1662-9. Autologous bone marrow-derived mesenchymal stromal cell treatment for refractory luminal Crohn's disease: Results of a phase I study. Duijvestein M, Vos AC, Roelofs H et al.

<http://www.ncbi.nlm.nih.gov/pubmed/23053677>

Int J Colorectal Dis. 2012 Sep 29. Expanded allogeneic adipose-derived stem cells (eASCs) for the treatment of complex perianal fistula in Crohn's disease: results from a multicenter phase I/IIa clinical trial. de la Portilla F, Alba F, García-Olmo D, Herrerías JM, González FX, Galindo A.