Research finds new therapy options for children with severe juvenile idiopathic arthritis

December 21 2012

Systemic juvenile idiopathic arthritis (SJIA) has long been considered a therapeutic orphan. Until now, the principal effective treatment has been high-dose steroids (prednisone) which are accompanied by several serious side effects. Newer treatments for other forms of JIA have not been as successful for the systemic subtype.

SJIA, an inflammatory disease, accounts for approximately 15 per cent of all children with juvenile idiopathic arthritis there are currently approximately 60 children followed with SJIA at SickKids. High fever, skin rashes, and swelling of the joints and inflammation of internal organs such as heart, liver, spleen and lymph nodes are some of the symptoms that children with SJIA face daily.

Two recent studies in the New England Journal of Medicine have assessed other treatment options for these patients and found two biologic drugs to be safe and effective therapies for children with SJIA. In both studies, many children who were treated with these drugs not only achieved a status of inactive disease (no fever, no joint inflammation) but also showed a reduction or discontinuation steroid use.

Both international studies were conducted by the Paediatric Rheumatology International Trials Organisation (PRINTO) and the Pediatric Rheumatology Collaborative Study Group (PRCSG), which the

Rheumatology Faculty at The Hospital for Sick Children (SickKids) and University of Toronto are members of. Dr. Rayfel Schneider was one of the co-investigators of both of these studies and the lead SickKids investigator.

"This group of patients is typically very challenging to treat. This research is a major step towards improved therapy options that are safe and effective." says Dr. Rayfel Schneider, Staff Physician and Project Investigator in the Department of Rheumatology at SickKids. "No unanticipated side effects were observed and those that did occur are also seen with other medications in this class."

Each therapy works by blocking specific molecules that are involved in the development and persistence of inflammation. The molecules called Interleukin-6 and Interleukin-1 have been found to be central to the pathogenesis of SJIA.

In one of the randomized controlled trials, a biologic called tocilizumab was administered to target the Interleukin-6 receptor. This study provides the first evidence in a controlled setting involving a large number of patients from around the world that blocking the action of Interleukin-6 with tocilizumab is highly effective, and safe, in patients with severe and persistent SJIA. After one year of treatment, one third of the patients reached clinically inactive disease and approximately half had stopped taking oral corticosteroids. This study was conducted at 43 centres worldwide.

In the other study the efficacy and safety of a biologic called canakinumab was assessed. Canakinumab selectively binds to Interleukin-1 beta and inactivates the signaling that leads to inflammation. The study was divided into two clinical trials; the first to provide evidence that the drug is effective in controlling fever and arthritis, and the second to further investigate the efficacy and safety of

canakinumab in SJIA with active systemic features and the ability to reduce the dose of prednisone. The study demonstrated that even a single injection of the drug can result in inactive disease in as few as 15 days among 32 per cent of the treated patients. And after just seven months of treatment the drug allowed for discontinuation of steroid treatment for 45 per cent of the patients.

Overall, both therapeutic approaches proved to be safe and effective. "This appears to be a major step forward in the treatment of children with SJIA and may lead to a change in the outcome of a difficult-to-manage, and potentially fatal disease," says Dr. Schneider.

Provided by SickKids