Bath Institute for Rheumatic Diseases
Second Floor, RNHRD, Upper Borough Walls, Bath BA1 1RL
Telephone: 01225 336363 Email: BIRD@birdbath.org.uk Registered Charity Number 1040650

Supporting Patients through Education & Research

Lay Summary - Autoantigen specificity in Juvenile Idiopathic Arthritis – Dr Sarah Tansley

It is often assumed that arthritis only develops as we get older but in the UK there are approximately 15,000 children and young people affected by arthritis; that's about 1 in every 1000 children. Juvenile idiopathic arthritis (JIA) is inflammation of one or more joints that develops before 16 years of age. Some children may develop disabling joint disease and have persistent active disease into adulthood. There are different types of JIA and the symptoms and likelihood of outgrowing the disease varies between the different types. Some children with JIA also develop eye involvement known as uveitis. This is symptomless inflammation in the eye that can lead to permanent visual impairment.

We are trying to identify a simple blood test that could help predict which children are most at risk of JIA associated uveitis. This would allow those children to be more closely monitored so they can receive treatment early. Early treatment is important to prevent sight loss. Children who are not at high risk of developing uveitis would not need to be monitored as regularly freeing up clinical time.

We and others have shown that the presence of factors in the blood known as autoantibodies are associated with JIA and the development of eye disease in particular. In healthy people the immune system creates antibodies against viruses and bacteria to help fight infection but in patients with diseases like JIA, the immune system mistakenly creates antibodies against substances normally found in our own bodies, these are known as 'autoantibodies'. Patients with different diseases produce different autoantibodies. While we know patients with JIA can produce autoantibodies and that these are important, we do not know the specific type of autoantibody. Characterising the JIA autoantibody further will allow the development of specific blood tests so that children can be screened for the autoantibody when they are diagnosed and their risk of uveitis and need for monitoring easily established.

Progress to date

So far we have analysed blood samples from 433 patients with JIA and 48 healthy children. We have found an autoantibody in over half of patients with JIA and typically at high levels.

We noticed that the autoantibody seen in most children with JIA had a characteristic pattern looking down the microscope, we called this 'dense fine speckle/homogenous'. We have been able to show that it is autoantibodies producing this pattern that are strongly associated with the development of uveitis. These findings were presented at the British Society of Rheumatology annual conference in April 2016. The dense fine speckle/

homogenous pattern we see down the microscope is an important clue in characterising the JIA uveitis autoantibody further and has helped us to plan the next phase of experiments.

I have been successful in optimising experimental techniques used in the past to identify autoantibodies in different rheumatological diseases that we think have similar characteristics to the JIA autoantibody. This has allowed us to use the same technique on blood samples from JIA patients but unfortunately this has not allowed us to identify the JIA autoantibody. There are several reasons why this type of experiment may not work and we now plan to these reasons to adapt the technique further and/or choose different experimental strategies.