Juvenile Arthritis: New Discoveries Lead to New Treatments

Arthritis is a disease that mostly affects older people, right? Not necessarily.

Juvenile arthritis is one of the most common chronic illnesses affecting children. In fact, nearly 300,000 youngsters nationwide have been diagnosed with the disease. The most common symptoms include joint pain, inflammation (swelling), tenderness and stiffness. One early sign may be limping in the morning.

Nikolay Nikolov, a rheumatologist and clinical team leader at the Food and Drug Administration (FDA), says that children with juvenile arthritis and their parents have reason to be optimistic. In the last several years, new therapies have been developed by drug companies and approved by the FDA that moderate the effects and control the disease, likely preventing significant disability in later years.

While no one knows exactly what causes juvenile arthritis, scientists do know it is an autoimmune disorder. The immune system, which normally helps the body fight infection, attacks the body's own tissue.

There are several subgroups of juvenile arthritis. Known collectively as

X-ray of a 6-year-old's knee with juvenile idiopathic arthritis (JIA).

Juvenile Idiopathic Arthritis (JIA), these diseases start before age 16 and cause swelling in one or more joints lasting at least six weeks.

JIA affects large joints such as knees, wrists, and ankles as well as small joints. Polyarticular JIA, the largest JIA subgroup, affects many joints. Another subgroup is Systemic JIA, which affects the whole body, and usually causes fever and skin rashes.

In the past, the first line of treatment for children with juvenile arthritis has been to relieve pain and inflammation with non-steroidal anti-inflammatory drugs (NSAIDs) such as aspirin and ibuprofen. Children with severe juvenile arthritis have been treated also with drugs that suppress the body's immune

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response such as corticosteroids and methotrexate.

But polyarticular and systemic JIA are now also treated with newer medicines called biologics, which are manufactured in or extracted from biological sources.

Biologics: New Treatments for Juvenile Arthritis

"As science at the molecular level has advanced, we've learned more about what drives arthritis—the mechanism of the disease—and we are able to identify important targets," Nikolov says.

These targets include cytokines (molecules that control and drive inflammation in the body) such as tumor necrosis factor (TNF), interleukins (IL), and other naturally occurring proteins involved in stimulating the body's immune response. Biologics used in the treatment of juvenile arthritis are generally given intravenously or subcutaneously (under the skin), and usually are taken for years. Different biologics tend to work better for different subgroups of the disease. In recent years, FDA has approved several of these treatments. Here are their names, the type of JIA they treat and approval dates:

- Humira (adalimumab) for polyarticular JIA, February 2008
- Orencia (abatacept) for polyarticular JIA, April 2008
- Enbrel (etanercept) for polyarticular JIA, May 1999
- Actemra (tocilizumab) for systemic JIA, April 2011 and polyarticular JIA, April 2013
- Ilaris (canakinumab) for systemic JIA, May 2013.

"In addition to improving the signs, symptoms and physical functioning of patients, many of these biologics have been shown to reduce joint destruction in adults with rheumatoid arthritis (RA), a disease that is related to juvenile arthritis, and thus to change the natural history of the disease," Nikolov says.

While researchers don't yet have a lot of long-term safety information on use of these drugs in children, there is significant experience with their use in adults with RA. Biologics used for the treatment of patients with juvenile arthritis are potent drugs that suppress the immune system and can increase the risk of serious infections, including opportunistic (unusual) infections and tuberculosis.

Expanding Use of New Treatments to Children

When a drug is found to benefit adults with RA in large clinical trials, drug manufacturers may study it in children with juvenile arthritis to find out if the drug works for them too. In addition, FDA considers the known and potential risks of the drug to determine whether its benefits in treating juvenile arthritis outweigh these risks.

"It's possible that safety issues might come up in kids that we have not found in adults. For example, these drugs may affect the developing body and immune system in children, and that may warrant changes in the labels to let both health care providers and patients know what are the risks involved, and how to recognize and respond to potential problems," Nikolov says.

Meantime, scientists continue to work on improving existing treatments for children and search for new treatments that will work better with fewer side effects.

"We don't have a cure for juvenile arthritis—we're not there yet," says Nikolov. "But we're making progress." FDA

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