

Biologics. A cure or a problem?

Conducting clinical trials teaches you a lot about medical science and projections for the future of medicine. I am blessed to be a part of many studies and I cannot overestimate how much not only I learned but also could share with my staff and patients.

Patients often come to enroll in clinical research and ask questions about effectiveness and risk of the new medicine. The most interest is on the biologics, which, at least in psoriasis, revolutionized the methods of treatment and upgraded the future demands of safety and efficacy. Patients also ask about side effects as they heard hundreds of stories, often from other doctors, on how biologics can kill you.

Well, Tylenol can kill you as well. While every medication may have potential side effects, known and unknown, it is crucial to truly understand how biologics are developed and how they changed the way of medical treatments.

In 1990-2003, Human Genome Project concluded by Dr. Francis Collins at National Institute of Health in Bethesda, MD, identified sequential order of human genetic design: chromosomes and related to them genes were placed in a chain of functional order, helping us understand where and how some of us may come from and what medical problems we may develop. Among others molecules, over 50 interleukins were discovered and linked to many chronic and acute disorders. A word 'interleukin' is a combination of 2 : inter and leucocytes. Leucocytes are white blood cells responsible for our immune system. Their elevation shows when our bodies fight infections (like in pneumonia) and when we are compromised low (like after chemotherapy). Interleukins are inter-communication signals of our immune system in a form of proteins. Our immune system depends on interleukins and the deficiency in their functions or communication result in auto-immune disorders. Many of chronic medical problems were directly connected with interleukins.

I realize it might sound very complicated but now, I will bring it down to my daily practice. Thanks to all these discoveries, we learned in early 2000s that psoriasis was linked to interleukin 17 and 23. The early targeted biologics did not have names; we



called them IL-17 or IL-23. They were targeted towards the disease: in other words, psoriasis was a target of IL-17 and IL-23 but we did not see any other major organs associated with these two proteins. Scientists had much hope that, by limiting the target to a single path, they will make new molecules safer to use and more effective to help the disease.

Biologics are these molecules. They can be IL-17 or IL-23, or many other ILs, depending on specialty of medicine and a target disease. Biologics are natural drugs, coming from human tissues or humanized animal tissues (having the same sequence genetically as humans). They can be life-savers, like recently in cancer. They can be a great 'cure' like in hundreds of my psoriasis patients. They definitely do not kill.

But, like always in medical science, each human body is different and each reaction, to biologic or Aspirin, can vary and should be watched. We as doctors have unlimited space for more education and constant progress in how we treat our patients. While being responsible for the patients' safety, we also must be brave to try new venues. If we do not, we ultimately create risk of stagnant minds and lack of medical cure. Dr. Collins would not advise that.

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