Keynote

01 UNDERSTANDING AND TREATING SLE: A NEW ERA IS DAWNING

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Our understanding of the pathophysiological mechanisms in systemic lupus erythematosus (SLE) has increased over the years and with that came the hope that more effective therapies could be developed; however, progress in the therapeutic area has been slow. An appreciation of the important role of autoantibody producing B-lymphocyte-derived plasma cells in SLE led to the development and subsequent approval of a B-cell specific biological therapy, belimumab.[1–3] As could have been expected, this treatment was shown to be most effective in patients with anti-DNA antibodies and complement activation.[4] Perhaps surprisingly, the efficacy of this treatment in lupus nephritis, the manifestation of SLE most closely associated with the highly specific anti-DNA antibodies, remained incompletely established until a recent large randomised clinical trial demonstrated convincing efficacy when belimumab was added to standard background treatment in patients with progressive lupus nephritis.[5]

Moreover, improved understanding of the cellular processes involved in nephritis and the development of proteinuria supported the development of voclosporin, which demonstrated efficacy in a Phase 3 clinical trial.[6]

Meanwhile, other pathophysiological pathways in SLE also attracted attention. Both interleukin (IL)-12 and IL-23 were shown to be involved in aspects of SLE, and a Phase 2 clinical trial demonstrated efficacy for the IL-12/23 inhibitor ustekinumab. Blocking multiple cytokines using the JAK inhibitor baricitinib was also effective in a Phase 2 trial.[7]

The role of the type 1 interferon (IFN) pathway in SLE has been under intense scrutiny for many years. Pioneering work by Rönnblom and other investigators demonstrated the presence of interferon and interferon-related gene activation in the majority of patients with SLE,[8] and identified the plasmacytoid dendritic cell (pDCs) as the source of excessive IFN in this disease. An etiological link between defective clearance of nuclear breakdown products and excess IFN may be the most central immunological deviation in this complex disease. Following a successful Phase 2 trial, two Phase 3 trials of the IFN-receptor antagonist anifrolumab demonstrated efficacy in a range of outcomes.[9] Early studies with a monoclonal directed against the pDC marker BDCA2 also showed clinical efficacy.[10]

Based on these developments taken together, it is now correct to say that for understanding and treating SLE, a new era is dawning.

Learning Objectives

- Demonstrate understanding of the key pathophysiological mechanisms in SLE
- Describe the different therapeutic targets in SLE and the importance of new drug development aimed at these
- Discuss how the therapeutic landscape in SLE may evolve in the near future

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New Developments in Basic Science and Clinical Research: Defining SLE

02 DEBATE: A MAJORITY OF LUPUS PATIENTS (WILL) NEED A BIOLOGIC!

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The mortality figures for lupus have improved from 50% 4-year survival in the 1950s to approximately 85% 15-year survival now. This change has resulted from the judicious use of steroids, immunosuppressive drugs, concomitant therapies, dialysis and transplantation; however, there seems little prospect that these figures will improve further. A Canadian study showed that lupus patients are still, overall, three times more likely to die than the rest of the population[1], a figure which increases to twelve times in those aged under 40 years old. A UK study showed the premature mortality gap in lupus has not closed in a recent 16-year period.[2]

In addition to mortality, morbidity linked to the disease, concomitant diseases and treatment side-effects remain a big problem. Steroids in particular are a major culprit. As an example, myocardial infarction, infection and some cancers remain increased in lupus patients.

In this debate, I will try to persuade you, using both data and the works of Cornelis Escher and Kathe Strenitz, that to improve both the longevity and quality of life of lupus patients, we must embrace new treatment paradigms including biologics and small molecules and whatever comes next! Biologic drugs such as rituximab have shown great benefit in the treatment of lupus[3] and in reducing, even abolishing, the need for concomitant steroids.[4] Other drugs like belimumab have

demonstrated utility for lupus patients with joint, skin and renal disease. It is likely that other biologics identified more recently, such as anifrolumab, will have a part to play for those lupus patients for whom standard drugs are insufficient.[5] These changes will not happen today, tomorrow or next year, but in the next decade I predict that the majority of lupus patients will be treated with biologic drugs and newer treatment modalities.

Learning Objectives

- Explain the need for new biologic treatments for patients with lupus, for whom standard drugs have failed
- Describe the importance of embracing new evidence-based treatments including small molecules and biologics, for the numerous disease manifestations that characterise lupus
- Discuss the role of biologic therapies in future treatment of patients with lupus

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03 DEBATE: A MINORITY OF LUPUS PATIENTS (WILL) NEED A BIOLOGIC!

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Obviously, the expected role for biologic therapy in lupus is to control disease activity and prevent damage and co-morbidities, but what is the evidence that we are not faring well in those areas?

Over the past 5 decades there has been a dramatic improvement in survival rates for patients with systemic lupus erythematosus (SLE) perhaps due to a combination of earlier diagnosis, more effective treatments, recognition of important comorbidities and their earlier diagnosis and treatment. Currently, the 20-year survival rate is 80%![1 2] Standardised Mortality Ratios have decreased from over 14 in the 1970s to just over two in the 2000s.[3] Furthermore, the cause of the 206 deaths in our cohort due to lupus was only 19% whereas deaths from atherosclerotic disease was 21.5% and from infection 34.6% neither of which would require a biologic.[4] In terms of disease activity, in the first decade of disease the adjusted mean Systemic Lupus Erythematosus Disease Activity Index-2K (AMS) has decreased from 7.94 in the 1970s to 5.16 in the 2000s and the percentage of time on prednisone >7.5 mg was significantly lower, all indicating much improved control of disease. This is corroborated by the fact that patients are spending a significant portion of their disease over the first 10 years in clinical remission.

So, if patients are surviving longer with less active disease and lower steroid therapy, are they suffering more co-morbidities? The prevalence of atherosclerotic vascular events has similarly declined over the past 4 decades in our cohort from a prevalence from 11.0% to 3.8% (an incidence of 0.44 per 100 patient years) an incidence seen also in the SLICC cohort. [5] This dramatic decrease is due to better control of lupus disease activity and also treatment of atherosclerotic risk factors.

Finally, when one looks at the randomised controlled trials with biologics in lupus, more than a third of the placebo-treated patients who were getting standard of care achieved their respective primary endpoints. The difference in outcome in those getting biologics was only in the range 10% greater, hardly a major impact.

In summary, lupus is being much better controlled, less steroid is being used, co-morbidities are less and biologics to date have had a minimal impact. A Minority of Lupus Patients Will Need a Biologic!

Learning Objectives

- Describe how lupus survival has improved dramatically in past 5 decades
- Explain how mortality in lupus is now less related to lupus and more related to co-morbidities or infection
- Demonstrate that lupus patients are currently spending more of their time in remission and on less corticosteroids
- Show that the major co-morbidity atherosclerotic vascular disease has decreased dramatically

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Plenary I: New Aspects in the Management of SLE

04 MEASURING SLE DISEASE ACTIVITY IN 2020: PERSPECTIVES FROM CLINICAL RESEARCH

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Systemic lupus erythematosus (SLE) is a chronic autoimmune disease with heterogeneous clinical presentation and disease course. It can involve many organ systems with widely diverse clinical patterns in different patients and over time. Furthermore, there are no reliable biomarkers for monitoring the disease course. As a result, measuring SLE disease is highly challenging and there is a lack of user-friendly,