

# Demystifying Systemic Lupus Erythematosus

By Michelle Le

When Angelina Pitt-Jolie received a preventative double mastectomy upon finding out she had the BRC-A2, a gene known to increase the risk of acquiring breast cancer, the world had a peak interest in breast cancer and prevention measures. Equally, when Selena Gomez announced her Lupus diagnosis this past year, there was an overwhelming interest in the media. To jump on the bandwagon of popular media, HSI presents an article on the mysterious Systemic Lupus Erythematosus (SLE) and its ongoing research.

## Systemic Lupus Erythematosus: the nuts and bolts

Systemic Lupus Erythematosus is an autoimmune disease affecting close to 1 in 1000 people worldwide with the incidence rate increasing yearly. Although the mortality rate of lupus has significantly decreased over the past 10 years, there is no real cure for SLE. A lupus diagnosis is mostly determined through clinical presentation rather than a specific serum biomarker. As a result, overlapping and evolving symptoms can make SLE difficult to recognize and diagnose. The most common clinical presentations of SLE include skin rash and photosensitivity, which enables a quick lupus diagnosis. Arthritis, nephritis, pleuritis, pericarditis, anemia and leukopenia are also symptoms commonly seen in lupus patients. While the severity of clinical symptoms is variable, the most severely affected organs are the central nervous system, the kidneys, and the lungs. Disability consequences including work loss, activity limitations, perceived mental and physical exhaustion and reduced quality of life are commonly found in SLE patients with targeted organ damage (1).

Lupus frequently affects women of child-bearing age and is more commonly diagnosed in women than in men. Lupus is significant during childbearing years as the disease will increase the risk for miscarriages by 12.4% (2,3) and the development of neonatal lupus (4) and autism (5). However, it is possible for women with lupus to have a successful

pregnancy provided that pregnancy planning is discussed alongside the care of a rheumatologist. Also common in 30 to 40-year-old women with lupus is a five- to six-fold increased risk of coronary artery disease (CAD) (6).

Clinicians and patients alike are excited for the medications that are currently being developed for lupus. In the past 50 years, belimumab (Benlysta<sup>®</sup>) has been described as the most exciting break through in lupus research. Belimumab is a monoclonal antibody that targets BlyS, an upregulated mediator that prevents autoreactive B cells from being activated in lupus. Apart from Benlysta, off label medications such as cortisone and chemotherapy are the most commonly used for lupus management.

## Research: an ongoing hope for SLE patients

While the mechanism of lupus has yet to be discovered, many researches are currently being conducted to have a greater understanding of the disease and its manifestations. Founded in 1970, McGill University Health Centre (MUHC) Lupus Clinic in Montreal, Canada is the second largest lupus clinic in North America. Notably, the McGill Lupus Clinic, known for its research in the field of lupus epidemiology, has one of the largest cohort lupus studies in the world with over 700 participants.

Currently, several McGill clinic doctors are involved with lupus research. Dr. Christian Pineau is the co-director of the lupus and vasculitis clinic at the McGill University Health Centre. He describes the research done at McGill as crucial to learning more about lupus. Dr. Pineau himself is interested in defining and limiting the burden of cardiovascular disease and non-vascular cardiac diseases in SLE. Notably, Dr. Pineau has actively pursued strategies aimed at preventing cardiac disease in the systemic lupus patients by focusing more attention on potentially reversible cardiac risk factors such as hypertension, cholesterol, antiphospholipid antibodies, and homocysteine. Lupus may also affect child bearing and

cause miscarriages due to the effect of increasing blood clotting. Dr. Evelyne Vinet, a clinician and scientist at MUHC, studies the reproductive issues in women with lupus. In preliminary studies, Dr. Vinet and her colleagues have found that women with lupus are more likely to have a child with autism compared to women without lupus. Research on the association of lupus with malignancy is spearheaded by Dr. Sasha Bernatski and involves over 40 lupus centres. Additionally, Dr. Louis-Pierre Grenier investigates the role of increased risk of recurrent thrombosis in lupus while Dr. Joyce Rausch studies the role of anti phospholipid syndrome commonly present in lupus. Elucidating the mechanism of lupus manifestation is equally important as studying clinical presentations. In the basic science department, Dr. Emil Nashi is studying the B cell activation pathway involved in lupus. Specifically, Dr. Nashi is investigating how B cells respond to their environment and comparing this between lupus patients and people without autoimmune disease.

#### What's next for lupus research?

Though research is promising, there is still much to be learned in this field of autoimmune diseases. Going forward, Dr. Pineau of the McGill Lupus Clinic believes that there needs to be an increased focus placed on lupus epigenetics and associated microbiome to have a better understanding of lupus development and to predict lupus severity in individuals. Medication development for lupus management is also on the radar. There is no doubt that many questions about SLE have yet to be answered. Research in SLE presents as a promising field for rising young scientists. ■

#### References

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