VibrantWellness

Research Spotlight: Novel Multiplex Testing for Early Detection of Autoimmunity

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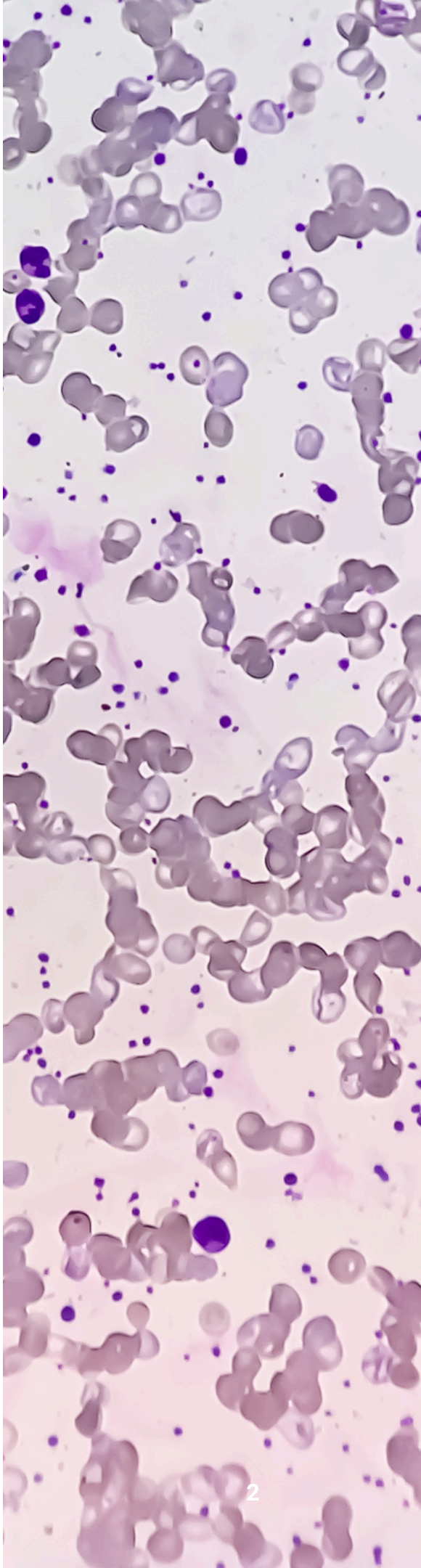

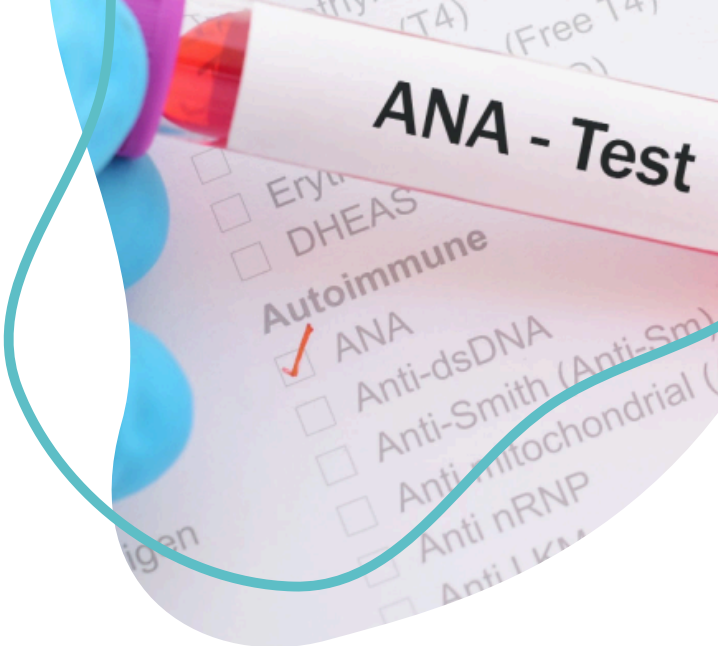

Autoimmune diseases represent a complex constellation of conditions where the immune system mistakenly attacks the body's own tissues.

From rheumatoid arthritis to systemic lupus erythematosus, the burden of these diseases is profound, affecting millions worldwide with a wide range of debilitating symptoms—and the concern is only growing.

The prevalence of autoimmune diseases has significantly increased over the last few decades.

Specifically, studies show a notable increase in antinuclear antibodies (ANA), the most common biomarker of autoimmunity, over the past 25 years in the United States.

The key to managing these diseases lies in early detection and treatment, which can significantly halt disease progression and improve quality of life.

However, the elusive and often overlapping symptoms of autoimmunity present substantial challenges in timely and accurate diagnosis.

This article explores novel biomarkers for detecting autoimmunity earlier through Vibrant Wellness research, opening new avenues for early intervention and tailored therapeutic strategies. Plus, we'll discuss precision testing to detect autoimmune diseases earlier and enhance longevity.

The Draw Backs of Traditional Testing Methods

Traditionally, detecting autoimmune disorders has relied on identifying autoantibodies such as antinuclear antibodies (ANA) with an immunofluorescence assay (IFA) on HEp-2 cells as the gold standard of testing.

ANA is a heterogeneous group of autoantibodies found in the serum of patients with systemic or organ-specific autoimmune diseases and various infections.

While this method has been instrumental in diagnosing conditions like Sjögren's syndrome and systemic sclerosis, it has limitations.

The sensitivity and specificity of such tests can vary, and results may be influenced by subjective interpretations and the presence of autoantibodies in non-diseased states, leading to potential false positives.[1]

A Multiplex Autoantibody Panel for Early Detection of Autoimmune Disease Activity:

Additional biomarkers known as ENAs or extractable nuclear antigens are also used to assess autoimmunity. However, this biomarker is typically used as a second screening test, only after patients test positive for ANAs.

ENA tests determine which autoantibodies a patient has after producing a positive ANA result with a homogeneous or speckled pattern.

The presence of each anti-ENA antibody can either confirm or exclude a diagnosis. However, in most cases, ENA tests will not be ordered when a person tests negative for ANAs by immunoassay.

Despite the testing norm, a multiplex test panel, which tests for both ANAs and ENAs simultaneously, can potentially reduce false negatives and diagnostic time.

Thus, in the latest study, our research team aimed to test out this type of autoimmune multiplex testing.

ANA + ENA Multiplex Testing for Autoimmunity

"A Multiplex Autoantibody Panel for Early Detection of Autoimmune Disease Activity" is a 2018 study published in Scientific Research.

In this study, our research team analyzed a cohort of 110 individuals who had received negative ANA and positive ENA test results at their initial screening.

The study aimed to assess the subjects' antibody levels over time to determine if initially testing for both ENA and ANA to detect autoimmune activity would be more beneficial than the current norm of testing for ANA alone.

The subjects had undergone testing for these antibodies at least three times over two and a half years, ensuring a comprehensive evaluation of their autoimmune status over time.

ANA and ENA Detection Techniques: Advanced Testing Technology

Our research team conducted ANA detection using the Vibrant ANA HEp-2 test, a solid-phase bio-chip immunofluorescence assay.

This advanced technology allows for high-throughput and automated testing, reducing human error and risk of contamination.

Unlike a traditional IFA, which relies on subjective visual assessments and can result in varying interpretations, Vibrant's solid-phase biochip immunoassay automates and quantifies the detection process.

This automation streamlines the testing process and minimizes variability, ensuring consistent and reproducible results.

The team used the Vibrant ENA-4 test to detect ENA antibodies, which identifies specific autoantibodies indicative of various autoimmune diseases.

This solid-phase bio-chip immunofluorescence assay is an advanced diagnostic tool used to test for ten antibodies simultaneously.

This immunoassay is faster and provides both qualitative (yes or no) and semi-quantitative (measuring the level) results, which helps in understanding how severe an autoimmune response might be.

This automated method also reduces the chance of human error and provides a precise, objective measurement of antibodies.

Results: Early Detection Findings

Initially, the subjects tested negative for ANA antibodies but were positive for at least one anti-ENA antibody at their first visit.

During two years, about 21% of them converted to ANA positive in an average of 385 (±144) days, while all remained ENA positive.

These results suggest that in the progression of autoimmune disease, anti-ENA antibodies can show up years before the presence of ANAs.

Thus, a combined test of ANA and ENA was more sensitive than using ANA alone and recognized autoimmune disease activity at an earlier stage.

The Significance of Anti-ENA Antibodies as Autoimmune Biomarkers

The presence of anti-ENA antibodies, even without ANA antibodies, was a critical predictor of potential autoimmune disease progression.

Subjects initially testing positive for ENA antibodies but negative for ANA were more likely to develop positive ANA results later, suggesting that ENA antibodies can be early indicators of autoimmune disorders.

This finding underscores the importance of including ENA tests in the diagnostic process for autoimmune diseases, providing a clearer and earlier picture of your patient's autoimmune status.

Multiplex testing can lead to better disease management and patient care by catching autoimmune activity earlier.

Precision Testing for Autoimmunity

To gain the earliest assessment of common autoimmune disorders, you can utilize Vibrant's Connective Tissue Disorders panel.

Connective Tissue Disorders Panel

The Connective Tissue Disorders panel tests for signs of a connective tissue disorder and related autoimmune diseases.

Connective tissue disorders (CTD) are a group of medical diseases where the body's connective tissues are attacked.

Most CTDs feature abnormal immune system activity with autoimmune-induced inflammation, where the body attacks its own connective tissues.

The panel uses a comprehensive list of markers to assess for autoimmune activity, including both ANAs and anti-ENA antibodies.

This novel testing method lets you catch Connective Tissue Disorders and related diseases earlier, improving outcomes.

See a complete markers list here.

Autoimmune Biomarkers & Preventative Medicine

By demonstrating the effectiveness of combining ANA and ENA tests, our research highlights how early identification of autoimmune markers can lead to timely interventions, potentially mitigating the severity of disease progression and improving patient outcomes.

This approach enhances the quality of life for those affected and reduces the overall healthcare burden by preventing the costly and extensive treatments often required in the later stages of autoimmune diseases.

Ultimately, integrating such sophisticated diagnostic technologies is crucial for pioneering a proactive, preventive health strategy that prioritizes early detection and intervention in autoimmune care.

References

1. Yang, Y. , Krishna, K. , Ranganathan, V. , Jayaraman, V. , Wang, T. , Bei, K. , Krishnamurthy, H. and Rajasekaran, J. (2018) A Multiplex Autoantibody Panel for Early Detection of Autoimmune Disease Activity. Open Journal of Rheumatology and Autoimmune Diseases, 8, 43-52. doi: 10.4236/ojra.2018.82004.

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