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RECOGNITION OF ANTINUCLEAR ANTIBODIES IN CHILDREN WITH RHEUMATIC DISEASES

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Abstract:

Aim: *To determine the positivity and prevalence of ANA in various autoimmune diseases in children.*

Patients and Methods: *This was a cross-sectional observational study conducted at the departments of Pediatric Medicine and Immunology and Serology of the Jinnah Hospital, Lahore for six months duration from March 2020 to August 2020. More than 200 blood samples were taken from various medical departments and external medical departments, and serology for ANA Elisa tests was also performed. Of these, only ANA positive patients were selected. Pre-designed pro-form information and data were analyzed by SPSS version 19.*

Results: *Of the 200 patients, 45 (22.5%) were ANA positive. Of 45 ANA positive patients, 25 (55.6%) had a diagnosis of SLE, 9 (20%) had MCTD, 5 (11.1%) had scleroderma, 4 (8.9%) had dermatomyositis, 2 (4.4%) had polymyositis. There was also a female advantage with a female to male ratio of 3: 1.2. The age of the studied population ranged from 3 (minimum) to 16 (maximum) years with an average age of 10.29 ± 3.80 years.*

Conclusion: *The ANA Elisa test can be used as a screening tool for clinically suspected rheumatic diseases in children.*

Key words: *antinuclear antibodies, systemic lupus erythematosus, mixed connective tissue disease.*

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INTRODUCTION:

Childhood rheumatic diseases are complex chronic diseases that are clinical symptoms of connective tissue of the musculoskeletal system, blood vessels and skin. They are rare in children, and when they do occur, they can be difficult to diagnose and difficult to treat. Rheumatic diseases are widespread worldwide, although there are significant differences in the prevalence of the same diseases between different racial groups. It has been difficult to pinpoint the extent of childhood rheumatic diseases in specific populations with any accuracy. The most common rheumatic diseases were juvenile idiopathic arthritis (JIA), systemic lupus erythematosus (SLE), dermatomyositis, scleroderma, and juvenile idiopathic arthritis (JIA). The combination of genetic predisposition and environmental factors contribute to the development of autoimmune diseases. Many autoimmune diseases start relatively young and continue throughout life. They have a disproportionate impact on public health, and the estimated annual cost in the United States alone is over $ 100 billion. In addition, most autoimmune diseases are chronic in nature and require lifelong care. Autoimmune diseases affect 8% of the population, 78% of whom are women. Antinuclear antibodies (ANA) - Nuclear autoantibodies are a diverse group of antibodies that react to nuclear, nucleolar, or perinuclear antigens. These antigens represent cellular components such as nucleic acid, histone, chromatin, nuclear and ribonuclear proteins. Classically, ANA is characterized by a serological diagnosis of SLE and is included in the American College of Rheumatology's SLE classification criteria, but finding ANA is common to most other autoimmune diseases. There are many reports of the prevalence of ANA in serum in healthy adults and children. The presence of autoantibodies in a patient does not guarantee the diagnosis of an autoimmune disease. Rather, a positive serological test combined with the relevant symptoms and signs helps in the diagnosis. In the past, many different methods have been used to test for the presence of autoantibodies. Currently, tests are mainly performed with enzyme immunosorbent assays (EIAs) due to cost-saving measures related to mechanization. Typically, screening a patient's serum for ANA by ELISA provides a high degree of sensitivity.

PATIENTS AND METHODS:

This study was conducted at the Departments of Pediatric Medicine and Immunology and Serology of the Jinnah Hospital, Lahore for six months duration from March 2020 to August 2020. All patients aged 1 to 16 years with clinical suspicion of rheumatic disease were enrolled in the study. Under aseptic conditions, trained personnel collected 3 ml of venous blood from patients, marked them with appropriate numbers and sent them to the Department of Immunology and Serology for ANA Elisa tests. The ORGENTEC ANA Detect test is intended for a qualitative enzyme immunoassay (EIA) to screen for serum antinuclear antibodies (ANA). Detection of ANA Elisa was negative when <1.0, border between 1.0-1.2, positive when> 1.2. The demographics and clinical symptoms of these patients were recorded. All data were recorded in a previously designed proforma and the results were analyzed using SPSS version 16. For quantitative variables, the mean ± SD is given. Frequencies and percentages for qualitative variables are given.

RESULTS:

A total of 200 patients participated. Of these, 45 (22.5%) were ANA positive and were included in the study for further analysis. ANA Elisa titers range from 1.22 to 6.20 with a mean of 2.87 +/- 0.886. There were 33 (73.3%) women and 12 (26.7%) men with a KF M 3: 1 ratio.

Table 1: Frequency of Rheumatic diseases among ANA positive study group (n=45)

Autoimmune Diseases	=n	%age
Systemic Lupus Erythematosus	25	55.6
Scleroderma	05	11.1
Dermatomyositis	04	8.9
Mixed Connective Tissue Disease	09	20
Polymyositis	02	4.4

The mean age at the time of the study was 10.29 +/- 3.8 years, with a minimum age of 3 years and a maximum of 16 years. Six patients (13.3%) were aged 1 to 5 years, 19 (42.2%) were aged 6 to 10 years, and 20 (44.5%) were aged 11 to 16 years. SLE was the most common ANA positive autoimmune disease (n = 25, 55.6%), followed by mixed comorbid disease, scleroderma, dermatomyositis, and polymyositis. (Table 1) The most common clinical symptom was rash (discoid lupus, buccal rash, heliotropic rash, vascular rash) in 42 (93.3%), followed by photosensitivity (88.9%), jaundice (68.9%), kidney involvement (66.7%) and arthritis (60%), Raynaud's phenomenon (42.2%), mouth and nose ulcers (33.3%),

muscle weakness (17.8%) and scleroderma (24.4%). (Table 2)

Table 2. Clinical findings of Antinuclear antibodies positive patients (n=45)

Clinical presentation	=n	%age
Rash*	42	93.33
Photosensitivity	40	88.89
Arthritis	27	60.00
Oral and/or Nasal ulcers	15	33.33
Jaundice	31	68.89
Renal involvement	30	66.67
Reynaud's phenomenon	19	42.22
l muscle weakness	08	17.78
dermal changes	11	24.44

DISCUSSION:

Antinuclear antibody (ANA) tests are often used to screen children for rheumatic diseases in childhood. However, the diagnostic utility of this test is limited due to the large number of healthy children positive for low titer tests. In our study, the ANA test was performed on 200 patients with clinical suspicion of some autoimmune rheumatic disease, but the result was positive in 45 (22.5%) patients. Indeed, Malleson and his colleagues have shown that the ANA test can be positive in up to 33% of healthy children. Other studies have confirmed that the ANA test is not specific in children. The most common autoimmune rheumatic disease in our study was SLE, which was found in 25 (55.6%) patients. Due to the variety of clinical images with which pediatric SLE is presented, it is often present in the differential diagnosis of children with difficult or difficult diseases. (17, 18). Antinuclear antibodies were positive in 95-99% of people with SLE. Although a positive ANA is not required for a diagnosis of SLE, yet a negative ANA is extremely rare in SLE. Most of our patients are women over the age of 8. Lehman et al. Reported the same findings in their studies. Because most of the patients in our study suffered from SLE, which manifests itself most frequently with rash, photosensitivity, arthritis, and mouth ulcers. This is in line with many other studies. Children with autoimmune rheumatic diseases are often clinically indistinguishable from other ANA-positive children for the conditions with whom they present to initial care. However, judicious use of history, physical examination, and thoughtful interpretation of the ANA titer will greatly help differentiate children with these conditions from children with milder conditions.

CONCLUSION:

ANA Elisa titers assist in discriminating children with autoimmune rheumatic diseases from children with other conditions. Patient age, gender and ANA titer are the best measures distinguishing children with autoimmune diseases from ANA- positive children with other illnesses or self- limited conditions. Because of its limited diagnostic specificity and high prevalence of false positive, ANA test should be used to address only when clinical examination is suggestive of some autoimmune rheumatic disease.

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