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Certain Immunological, Biochemical and genetic aspects in a group of autistic patients

A Thesis

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By

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Introduction:

1-1 Autism Spectrum Disorders(ASD)

Autism is a neurodevelopmental disorder marked by difficulties with social communication and empathy, as well as restricted and stereotypical interests and atypical responses (Lochman *et al.,* 2018). ASDs diagnosed in psychology using the Autism Diagntostic Interview, Revised(ADI-R), which lists social impairments communication and interaction problems, repetitive habits, and narrowed interests are all symptoms of the condition. ASDs affect children under the age of three, and males are four to five times more likely than female (Fernell & Gillberg, 2010).

The term "autism" was coined by Leo Kanner to describe a group of children he was studying. The term "spectrum condition" was applied to the term "autism" because children may have a wide variety of symptoms or traits that affect them, ranging from mild to extreme (Willis, 2006).

Autism's etiology and pathophysiology are not fully understood. However, psychological, environmental, immunological, and genetic factors all play a role in the etiopathogenesis of this disease(chauhan & chauan 2006).

Effective treatment is normally delayed due to unreliable early diagnosis.Social reinforcement and behavioral modification are now the most effective approaches to ASD care. However, the efficacy of this therapy is contingent on starting care as soon as possible. The most effective approach is to diagnose and treat patients as soon as possible (Lord *et al.,* 2018).

There are five different types of autism spectrum disorders (ASDs). The autism spectrum disorders, Asperger syndrome, which is characterized by delays in cognitive growth and language, and pervasive developmental disorder, not otherwise defined (PDD-NOS), which is diagnosed when the complete range of criteria for autism or Asperger syndrome is not met, childhood developmental disorder, and Retts Syndrome (Gelder *et al.,* 2007).

The genes may interact with each other or with environmental factors, causing the emergence of autism, and the mutations that cause autism have not been definitively identified (Beaudct, 2007).

To comprehend the immune system's possible role in ASD, one must first become acquainted with the key actors in the immune system, which serves as the body's defense against intruders, is a complicated system that interacts with a variety of different bodily systems, including the endocrine and neurological systems(Carpentier & Palmer, 2009).

The innate immune response is a first-line defensive system that responds to infections in a non-specific manner. (Murphy, 2011).

The adaptive immune system is a highly specialized collection of cells that responds to infections via immunological memory to remove or avoid reoccurrence. Its capacity to detect and recall individual diseases is its strength (Murphy, 2011).

1-2 Aims of the study

1. Assessment the level of the immunological biomarkers (CD4, IL-1α, INF-γ, TNF-α) in addition to biochemical markers (ALP, ALT, AST, TBIL, Creatinine) in serum of autistic patients and comparing it with healthy children.
2. Measuring the level of (WBC, RBC, PLT, HGB) in the blood of autistic patients and comparing them with healthy children.
3. A study of the cytogenetic side of autistic patient.

Abstract

The current study aimed to evaluate the immune role and some biomarkers of autism patients. Blood were collected from Patients in Ibn Rushd Hospital in Baghdad, and the study was conducted from September 2020 to March 2021, where the immune role in autistic patients was evaluated for measuring the immune indicators. Cluster of differentiation (CD4), Interleukine-1α level (IL-1α) and Interferon gamma (IFN-γ) as well as Tumor necrosis factor-alpha (TNF α) and measured by enzyme-linked immunosorbent assay (ELISA) technique.

The biochemical indicators included Alkaline phosphatase (ALP), Alanine aminotransferase (ALT), Aspartate aminotransferase (AST), Total Bilirubin (TBIL), and Creatinine) and hematological indicators (Platelets (PLT), Red blood cells (RBC), Hemoglobin (HGB), and white blood cells (WBC).

The study included 90 samples, including 60 samples for autistic patients (30 males and 30 females) with an age range ranging from (2 to 14 years), 30 samples were collected from healthy 15 males and 15 females within an age range (2 to 14 years), they were used as a control group that samples of autistic patients were collected before giving them treatment. After the patients consent.

The study showed that there is no effect of age and gender on autism. Was observed that the immunological indicators (CD4, IL_1α, IFN_γ, and TNF_α) were elevated in autistic patients (8.68 ± 3.06, 5.69 ± 2.50, 606.51 ± 286.62 and 84.07 ± 41.86) compared to healthy subjects (4.56 ± 1.99, 2.45 ± 1.11, 378.40 ± 126.35 and 29.80±13.76).