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Male Bias High Serum C5A Level in Autistic Children

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ABSTRACT

The present study was conducted on 88 children (55 ascertained ASD cases and 38 non-ASD healthy children). Performing serum C5a to both ASD and control and correlating its level with the gender of the study population. There was a significant association between gender and serum C5a level.

Key words: C5a, ASD

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INTRODUCTION

In recent years, the reported incidence of autism has increased at a significantly higher rate worldwide. Nevertheless, the reality is that this disorder has evolved from a low-incidence problem to an important diagnostic and treatment challenge for the wider professional community [1]. The term ASD was used regularly to refer to the group of common symptoms, but the presence and severity of these symptoms vary greatly. People with autism mainly suffer from social communication [2]. C5a is a pharmacologically active by-product of complement activation. They are small fragments cleaved from C5, the larger parent complement component that acts as anaphylatoxin. The main role of anaphylatoxin is to recruit inflammatory cells and lymphocytes to the site of tissue damage and infection, and when mobilized, activate these cells in a variety of effector responses [3].

MATERIALS AND METHODS

Study group

This case-control study was designed to determine the association between C5a level and gender in 3-16 years old ASD children compared to 3-12 years old control. The subjects included 50 ASD cases and 38 controls.

Ascertainment and selection of cases

Ascertainment of the ASD diagnosis was made according to criteria of the DSM-IV ,1994. All subjects diagnosed with ASD exhibited symptoms within the typical autistic traits. The families of these children with ASD were approached and their parents or attendants were agreed to have their children participate in this study.

Selection of controls

Control participants were randomly selected from eligible inpatients or outpatients. Eligible subjects were defined as children 3-12 years old who were not known to be autistic or to have any other neurodevelopmental or behavioral disturbances that might be related to or confused with ASD.

Excluded group

Children with neurological disorders other than ASD were excluded.

Study questionnaire

A questionnaire sheet was designed to meet the objective of this study. The mothers were interviewed concerning the information relating to the children.

Blood samples

Blood to be drawn from the patients, laboratory technician's hands were washed firstly then gloves were put on. The venipuncture site was cleaned with an alcohol pad and the area was cleaned with povidone-iodine starting at the site and working outward in a circular motion. The skin was let dry for 30-60 seconds. Performing a venipuncture, about 6 ml of blood was drawn from a child [4].

Determination of serum C5a

The quantitative analysis was done by using ELISA technique following procedure instructed by the manufacturer (Elabscience, USA).

Table 1: The association between C5a level and the gender of ASD.

C5a level	Group	Gender		Total
		Male	Female	
Normal	ASD	26 (74.2%)	9(25.7%)	35 (100%)
	Control	16(64%)	9 (36%)	25 (100%)
Chi-Square0.735 P-Value0.391				
High	ASD	14 (93.3%)	1 (6.6%)	15 (100%)
	Control	8 (61.5%)	5 (38.4%)	13 (100%)
Chi-Square4.182 P-Value0.041*				

Statistical analysis

Findings of the present study were displayed by table and data were analyzed using Chi-test and P-value. Results ≤ 0.05 considered as significant.

RESULTS

Studying for the association between C5a level and gender, the statistical difference between ASD and control within the normal level of C5a was non-significant (P=0.391). Relating to the high C5a level and its association to gender, there was a significant difference between ASD and controls (P=0.041). A higher percentage was recorded in males (93.3%) compared to a low percentage in females (6.6%) (Table 1).

DISCUSSION

Numerous studies have demonstrated that both primary-derived and CNS cell lines are capable of producing detectable levels of most complement components from both glia and neurons in vitro although the potential for a specific generation of C5a from these cells has never been explored. Neurons and glia can also endogenously express CD88, and these C5a receptors are up-regulated during CNS inflammation and disease, similar to peripheral inflammatory disease models, suggesting a role in CNS disease processes [5]. According to our findings, male children with ASD may significantly show high level of serum C5a than male children who were non-ASD (93.3% and 61.5% respectively).

Results of Ziabska, et al. [6] study were consistent with our findings documenting that the altered complement expression in peripheral blood and the brain from patients might suggest that ASD may somehow be attributed to aberrant activity. Study in USA done by Fagan, et al. [7] is somewhat different but lends credence to the present study where the findings from this study provide the initial evidence on the role of the complement system in the CNS of ASD subjects when reported significant increases in mRNA levels of C5 in the prefrontal cortex of ASD subjects as compared to controls.

CONCLUSION

High C5a level is more prevalent in males with ASD than females.

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