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Blood group and liver function parameters in pregnant women Infected with Toxoplasma gondii

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Abstract

Almost all warm-blooded species, including humans, are susceptible to infection by intracellular Toxoplasma gondii. There was no statistically significant difference between toxoplasmosis infection and animal interaction. Blood type was the only factor positively associated with T. gondii disease. Significant correlation was declared at a level of >0.05. It is preferable to pay attention to this important aspect of society in order to ensure healthy offspring capable of building the nation. Although not considerably, the toxoplasmosis patient's serum had lower mean levels of AST, ALT, and ALP. These discoveries may shed light on the pathogenesis of toxoplasmosis.

Introduction

The parasite *Toxoplasma gondii* is found in all geographical regions and climatic conditions. It can endure in a variety of hosts that are vertebrates. Humans have many animals, whereas cats and field animals are the ultimate hosts [1]. *T. gondii* infection susceptibility varies based on the types of parasites, the environment, and the genetic makeup of the human hosts [2]. The geographical variety of *T. gondii* and differences in food consumption practices between nations may be to blame for geographic variances in the seroprevalence of *T. gondii.* Prevalence among locally reared or harvested game animals used for human food or various degrees of oocyst contamination in the local environment [3].

Undergraduate female university students in Jordan found that 66.5% of the females had T. gondii IgG antibodies. 9.4% of Saudi female students enrolled in none only had IgM antibodies, but all tested positive for T. gondiiIgG antibodies at a university in northern Saudi Arabia. IgG and IgM levels in just one sample were both positive. [4,5]. The prevalence of toxoplasmosis among university students in Thi-Qar province was 21.94%.In contrast, the total incidence of Toxoplasma among Kirkuk University students was IgM and IgG antibody rates identical (11%) at 21.5% [6,7]. Prevalence among locally reared or harvested game animals used for human food or various degrees of oocyst pollution of the neighbourhood [3].

The frequency of T. gondii infection globally manifests once the hosts' immune systems are tested. It happens when tissue cysts burst, releasing the dormant parasite that multiplies quickly [8]. The present research's objective was to ascertain the frequency of infections with Toxoplasma at the University of Baghdad's College of Pharmacy and their relationship to various demographic factors [6].

Materials and methods

The samples were gathered from pregnant Baghdad women between the ages of twenty-one and twenty-five, and 134 serum samples were collected. The participants' average age was 21.25 years, and most were between 20 and 40. One hundred thirty-four blood samples from cross-sectional research conducted from December 2019 to May 2020 were tested for antibodies IgG and IgM. An ELISA kit, a commercially available test for anti-Toxoplasma IgG and IgM levels in the blood, was purchased from (ACON labs, San Diego, USA. According to the manufacturer's guidelines, an index value of >1.1 was considered positive for assessing anti-Toxoplasma IgG and IgM seropositivity on a qualitative level. Anti-slide tests for A and anti-B were detected using the manufacturer's recommended commercial monoclonal anti-sera anti-A and anti-B from Atlas Medical in the UK. If agglutination is present, the results are viewed as positive; otherwise, they are interpreted as unfavourable. With full adherence to the manufacturer's instructions, liver function parameters were calculated in all patients using a commercially available test kit technique on an automated analyser from Biotechnologies, Germany.

Sample collection

Patients undergoing blood group testing had five ml of venous blood drawn. The samples were centrifuged for 15 minutes at 3000 rpm to remove sera, and then they were left to clot at room temperature. For the anti-Toxoplasma IgM and IgG assay, sera were divided and frozen at (-20 °C).

Statistical Analysis

Percentages and other results were created using Microsoft Office Excel 2016. The SAS (2012) program determined how various factors affected the study's parameters. This study used the chi-square test to compare percentages meaningfully; a meaningful link had a P value of 0.001 or lower.

Result

According to tables 1, 2, and 3, and figure 1 it was examined for 150 pupils in connection to interaction with cats, and ABO blood type and age group.

Table 1. Disease relationship with contact with animals

Contact with cats	NO	Positive cases	Negative cases	χ^2	df	P-value
yes	30	10	24			
Little	10	0	9	11.99	2	0.0054
No	110	23	84			
Total	150	33	117			

Table 2. The relationship of blood groups with disease

Blood group	NO Positive cases	NO of negative cases	χ^2	Df	P-value
A	14	20	12.348	3	0.006
B	9	25			
O	7	54			
AB	3	18			
Total	33	117			

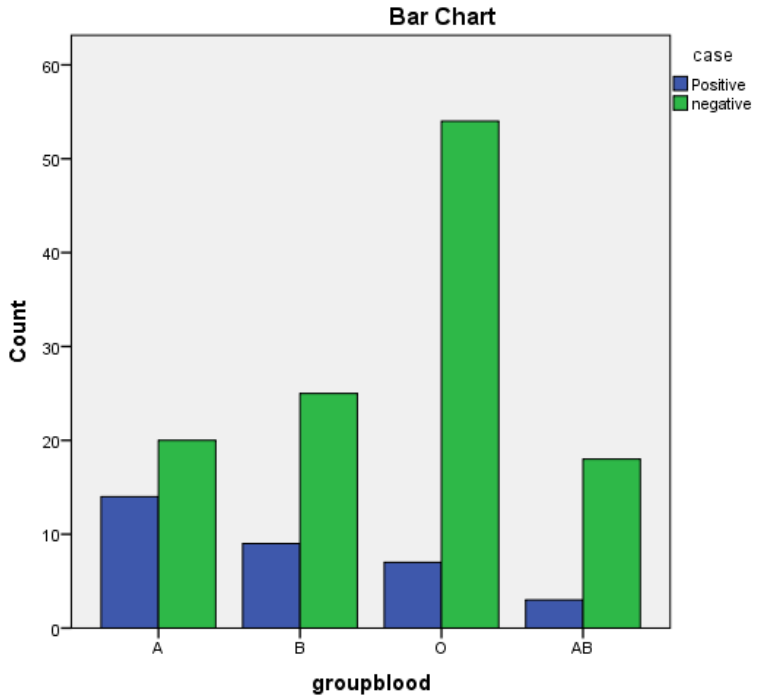

Fig .1 The relationship of blood types with disease

Table 3. The relationship of age groups with disease

Age groups	Total abortion	χ^2	Df	P-value
<20	11			
20-30	8			
30-40	4	3.485	3	0.323
>40	10			
Total	33			

Table 4. Average of AST, ALT and ALP concentration in persons infected with toxoplasmosis.

Parameters	Negative Toxoplasmosis Mean ±SEM	Positive Toxoplasmosis Mean ±SEM
AST (U/L)	32.1 ± 1.48	23.2 ±10.5
ALT(U/L)	21.50 ±7.95	21.33 ± 1.30
ALP (U/L)	153.2 ±49.5	149.1 ± 8.44

Discussion

A protozoan called Toxoplasma gondii causes toxoplasmosis in both people and animals.

It is one of the most widespread parasite illnesses in the world due to the variety of hosts it affects. [9]. It is a treatable but possibly fatal disease. [10] In the current study, Animal contact, such as interacting with cats, was not with toxoplasma positive. (Table 1), It shows that additional risks exist involved in the high incidence of infection., such as the intake of undercooked meat. This supports the finding that men are more likely than women to become infected [11].

Seropositivity was unaffected by contact with cats. The P-value which is then 0.0054. Nevertheless, individuals who had cat interaction had more excellent infection rates. This outcome was consistent with the research conducted. There was no statistically significant difference between animal contact and seropositivity to toxoplasmosis among female college students at the Shiraz University of Medical Sciences in the southern Iranian province of Fars [12]. A relationship between blood groups and positive instances was discovered in the current investigation, with a [13,14], subsequently, blood type A [9]. So, a B-type blood carrier may have an increased risk of contracting toxoplasmosis.) Our findings agreed with a nested PCR investigation on tissue and blood samples, which revealed that blood type B had a more significant percentage in tissue and blood group O had a lower number [7].

Although their findings were non-significant at the threshold of 0.05 [13], in contrast, Al-Mosawi discovered in the research for Thi-Qar University students that there is a correlation between blood type and infection with toxoplasma, with blood group B having the lowest prevalence (17.44%) and blood group A having the most significant prevalence (30.65%). [14] The average AST, ALT, and ALP levels were reduced in the serum of the toxoplasmosis-positive patients. The liver is severely and steadily damaged by toxoplasmosis, and the fantastic microbial proliferations caused by this damage have altered the liver's metabolism [15]. Our findings concur with those of earlier investigations [16,17,18].

These findings concur with research done on experimental animals [19,20,21,22] as well. These increases imply that liver cells are involved. Hepatic necrosis is a recognized consequence of toxoplasmosis [17], which can result in cholestasis, enlarged endothelial cells, round cell infiltration in the portal regions, and localized necrosis of liver cells. Although AST and ALT activity were lower than in the negative participants, the levels were still within normal limits, suggesting a little impact on the liver. Observable changes in serum enzyme levels revealed a propensity to rise following infection, which may indicate the severity of liver damage [23]. Although statistically higher, the liver enzyme activity is still within normal tolerable levels, meaning that toxoplasmosis may have an impact on the liver but that this impact may not be sufficient to cause clinical signs and symptoms.

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مجموعة الدم ومعلمات وظائف الكبد عند النساء الحوامل المصابات بعدوى التوكسوبلازما

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معلومات المؤلف
الايميل:

الخلاصة:

جميع الأنواع ذوات الدم الحار تقريبًا، بما في ذلك البشر، عرضة للعدوى عن طريق التوكسوبلازما جوندي داخل الخلايا. لم يكن هناك فرق ذو دلالة إحصائية بين الإصابة بداء المقوسات والتفاعل مع الحيوان. كانت فصيلة الدم هي العامل الوحيد الذي يرتبط ارتباطًا إيجابيًا بمرض T. gondii. تم الإعلان عن الارتباط الكبير عند مستوى> 0.05. ويفضل الانتباه إلى هذا الجانب الهام من المجتمع من أجل ضمان ذرية سليمة قادرة على بناء الأمة. انخفض متوسط تركيزات AST و ALT و ALP في مصل المريض المصاب بداء المقوسات وإن لم يكن بشكل كبير. يمكن أن تساعد هذه النتائج في توضيح الفيزيولوجيا المرضية لداء المقوسات.