Study Effect of Infection With *Treponema Palladum* at the Level of Antibodies and Some Blood Parameters and its Relationship With Blood Factions

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Abstract

The study was conducted on 30 patients and 20 healthy people to determine the influences of infected with *Treponema pallidum* on levels of IgM , IgA, IgG ,Complement4 ,complement 3 and some Blood parameters in infected with *T. Pallidum* also relation disease with blood factions in compared with healthy group who have visited Al-Sadder Medical City and Al-Hakeem Hospital in Al-Najaf governorate during the period from August 2014 till February 2015 in Al-Sadder Medical City Laboratories .The results showed significant increase (P<0.001) in IgM , IgG ,Complement4 in *T. pallidum* infected patients in compared to control group**.** Furthermore the results showed C3 was significant decreased (P< 0.05) in *Treponema Pallidum* infected patients in compared to control group also the results showed significant increase in WBCs, RBCs ,MPV and HCT level and significant decrease in MCV in patients compared with control group . The study also showed that the people of blood type A are more prone to infection, followed by blood type B and O, while there are no injuries to the blood type AB.

Key Words: *Treponema Pallidum* , IgG, IgM, C3, C4.

الخلاصة

صممت هذه الدراسة لتحديد تأثير الإصابة باللولبية الشاحبة *Treponema pallidum* على مستوى الأضداد (Ig M, Ig A, Ig G) والمتممة (C3,C4) وبعض معايير الدم لدى الأشخاص المصابين وعلاقة المرض بفصائل الدم في مدينة النجف الاشرف. حيث اشتملت الدراسة الحالية على(30) حالة إصابة ببكتيريا اللولبية الشاحبة و(20) حالة من أشخاص غير مصابين ارتادوا مستشفى الزهراء ومدينة الصدر الطبية ومستشفى الحكيم في محافظة النجف الاشرف للمدة من شهر آب٢٠١٤ ولغاية شهر شباط ٢٠١٥ في مختبرات مدينة الصدر الطبية. أظهرت الدراسة الحالية حصول زيادة معنوية في مستوى الأضداد Ig M, Ig (G) وكذلك المتممة, 4 حسب المعيار المعنوي(P< 0.001) في حين أظهرت الدراسة نقص معنوي في مستوى المتممة 3 (P<0.05) وكذلك سجلت الدراسة زيادة معنوية في مستوى بعض معايير الدم وهي كريات الدم البيضاء وكريات الدم الحمراء MPV, HCT و في حين سجلت نقص معنوي في نسبة MCV لدى المصابين مقارنة بمجموعة السيطرة. كما أوضحت الدراسة ان الأشخاص من فصيلة الدم A أكثر عرضة للإصابة تليها فصيلة الدم B و O في حين لم تسجل أي إصابة في فصيلة الدم AB.

الكلمات المفتاحية: اللولبية الشاحبة، الأضداد G، الأضداد M، المتممة ٣، المتممة ٤.

Introduction

T. Pallidum (TP) is the causative agent of the venereal disease syphilis. *T.P* is a spirochete bacterium with an outer envelope and a cytoplasmic membrane. relatively little is known about the organism in comparison with other bacterial pathogens. According to the Center for Disease Control (CDC), the number of cases of syphilis infection has markedly increased since 1985. Some key factors that have contributed to this rise include the crack cocaine epidemic(Chuck *et al*.,2008)

Syphilis is sometime considered an old and often forgotten infection , but many countries have recently observed an increased incidence and large localized outbreaks of the disease (2-10). In 2013 in the united states, the centers for disease control and

prevention reported the prevalence of syphilis to be 0.05 cases per 1,000, as such, syphilis is still very much a current problem(Levinson *et al*.,2004).

Infection by *T. pallidum* can be a lifelong condition when left untreated. Infection includes an initial symptomatic stage followed by prolonged latency and in some cases serious, symptomatic disease(Egglestone *et al*,2003). The identification of infected individuals through symptom recognition and clinical screening is limited by the often asympto-matic nature and short duration of the primary symptomatic stage and poor specificity of the secondary stage(Patton *et al*,2005).

The first sign of syphilis is usually a sore, called chancre, which is painless and appears on or near the genitals, though it can show up somewhere else, such as the mouth or anus. It may be accompanied by swollen glands, which develop within a week after the appearance of the initial sore. When the sore is present, a person is said to have the **primary** stage of syphilis. The sore may disappear by itself within 1 to 5 weeks, even without treatment, but the disease stays in the body. The **secondary** stage of syphilis begins approximately 7 weeks after the sore first appears. The most common symptom during this stage is a rash which may appear on any part of the body: trunk, arms, legs, palms, soles, etc. Other symptoms may also occur which include tiredness, fever, sore throat, headaches, hoarseness, loss of appetite, and swollen glands. These signs and symptoms last 2 to 6 weeks, and will disappear even if no treatment is received.(Workowski *et al*,2010).

II. SUBJECTS AND METHODS

A. Specimens

From August 2014 till February 2015, 30 samples were collected from patients and 20 healthy males who attended the clinics in AL-Sadder teaching Hospital , AL-Hakeem Hospital and healthy central laboratory in AL-Najaf province, two ml of blood samples were drawn from patients by vein-puncture put in tube with anti-coagulated EDTA (Abott/Jordan) which was used for determination the hematological parameters WBCs ,MCV ,MCH ,MPV, and RBCS.

B – diagnosis Blood group

Blood group diagnosed directly by used Blood group kit.

C- Measurement of the complement C3 and C4

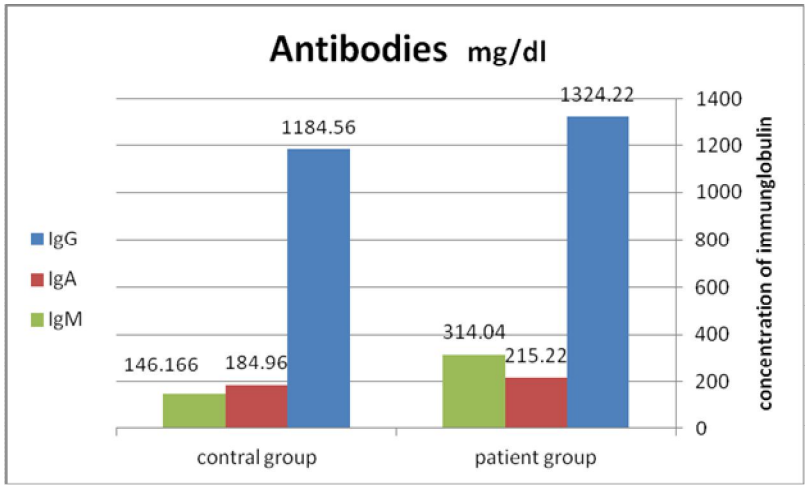
complement levels were measured by C3 and C4 commercial kits (a radial immun- diffusion test , Single Radial Immundoiffusion Test Kits, Beckman Coulter , US). The levels of C3 and C4 were determined in serum, which were isolated from venous blood obtained from controls and syphilis patients.

D-Measurement of immunoglobulin's` (IgG, IgM) in the serum

Single radial diffusion method in the gel was used normally processed from the company (LTA, Italy) in accordance with the instructions and the company processed by the principle of (Falck *et al*,2002).

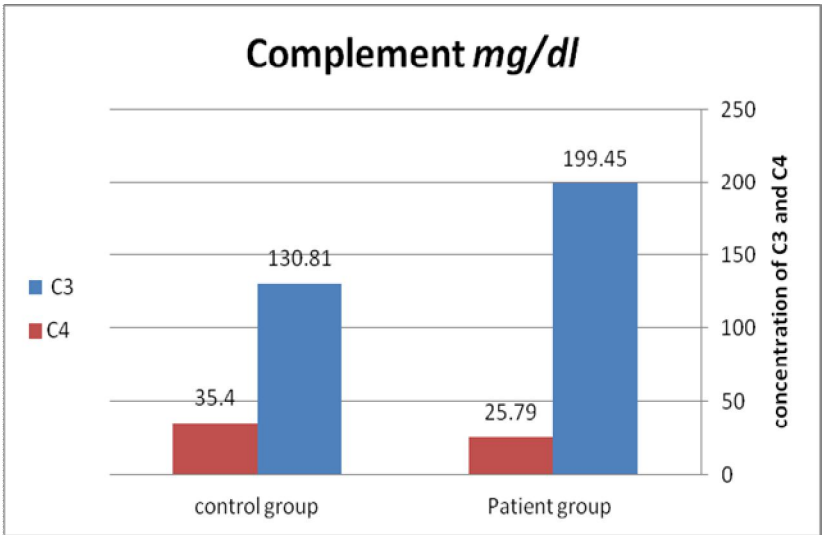
Result

The present study showed a significant increase in the level of antibodies in the serum in people infected with syphilis reaching the mean concentration of antibodies IgM, IgA, IgG, (314.04, 215.43, 1324.22) mg/dl respectively compared to the control group (146.66, 184.96,1184.56)mg / dl, respectively, as shown in Figure (1).



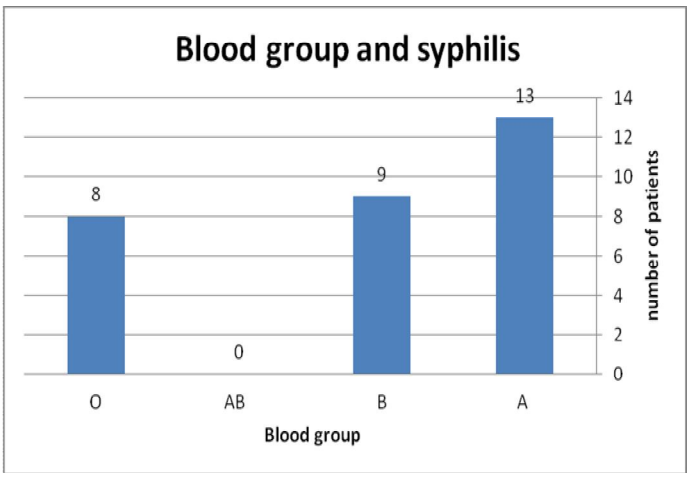
Figure(1) The concentration of Immunoglobulin in *syphilis* patients and control group.

The current study also showed a significant increase in the level of C3 in people infected with syphilis (199.45mg /dl) compared to the control group (130.81mg/dl) but the result was significant decrease in the level of C4 in people infected with syphilis (25.79 mg /dl) compared to the control group (35.4 mg/dl as shown in Figure (2)



Figure(2) Complement levels in *syphilis* patients and healthy group.

The current study has shown that the more people with syphilis are of blood group A(13/30), B and O while the study did not record any injury in people of blood group AB(figure,3)



Figure(3) The relationship between number of patient with syphilis and Blood group.

The current study also showed that the injury has an effect on some blood parameters (white blood cells, RBCs, MCV, MCH,CHT)(figures 4A and4B)

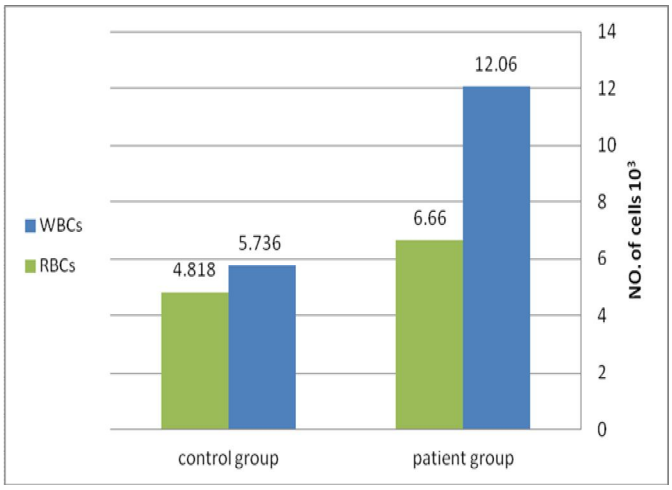


Figure (4A) WBC s and RBCs levels of syphilis patients and control group

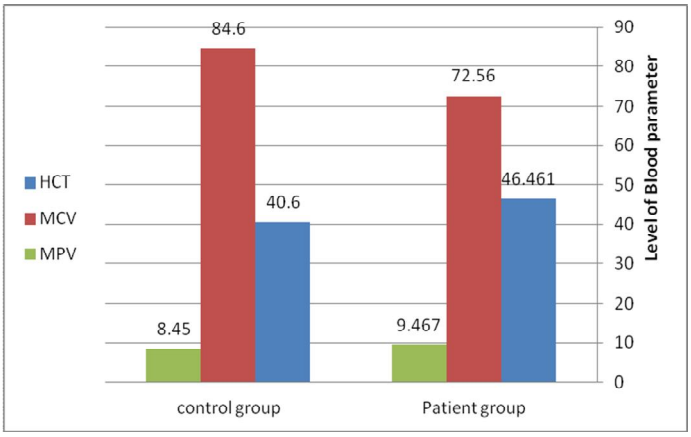


Figure (4A) Some Blood parameters levels of syphilis patients and control group.

Discussion

Antibodies and complement a role play in defense against bacterial infection in the body**,** including the bacteria that *Treponema palladium* when entering the body will stimulate the production of antibodies .IgM is the first antibody is product then followed IgG(Hanff *et al*,1983;Lukehart *et al*,1986;Muller *et al*,1981).IgM antibodies produced in infected human body because the bacteria *Treponema palladium* stimulated B cells. IgG continues produced during late latent syphilis (Baker-Zander *et al*,1985; Hanff *et al*,1983) and strong IgG reactivity has been established in serum up to 17 months after infection (Hanff *et al*,1983).

This study recorded higher in IgM and IgG concentration in people infection compared with control group. Also complement 4 recorded increase in patient compare with control group .this result explains role of complement in mechanism defense against infection. Complement activated directly pathogen or by pathogen-bound antibody. This result agrees with (McGrew *et al*,1968;Canale-Parola, 1978; Hardy *et al*,1983,Deka *et al*,2004).Also this study showed decrease of complement 3. This is agree with (Bishop *et al*,1976;Cunningham *et al*,1988;Borenstein *et al*,1991;Alderete *et al*,1979).

After the finding of blood groups many studies on relation of blood groups and different diseases have been performed. Chemicals sits on the Red Blood Cells are play role in primary identified as cell antigens. These act as receptors for bacteria, virus and parasites (Garratty *et al*,1994 ;Moulds *et al*,2000).

This study showed that syphilis spread depends on the type of blood group. Where results showed that people of blood group A are more susceptible to injury(43.3%) and then followed by blood group B (30%), O (26.7%) respectively, in while there have been no cases in blood group AB also this result showed syphilis disease an effect on some blood parameter where injury works on an increase in the level of (white blood cells, red blood cells, MPV, HCT), and a decrease in the level of MCV.

Conclusion

It was concluded from the current study that *Treponema palladium* infection have a significant impact on the levels of Ig M, G, as well as its effect on the complement C3 and C4. Also blood groups have a significant impact on the spread of syphilis

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