Serological Diagnosis and Data On Syphilis In The Marital Examination Unit And The Main Blood Bank At Teaching Al-Haboubi Hospital

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Abstract: Syphilis was a chronic sexually transmitted disease and was caused by caused Treponemapallidium. The study was conducted on serological diagnosis of syphilis by Elisa and cassette, and data on syphilis (2015,2016,2017) at Teaching Al-Haboubi Hospital at the Marriage Examination unit and the main Blood Bank In the province of Dhi Qar. This study revealed the people coming to marry for the year (2015, 2016,2017) of the Number (2400 ,2000 ,1600) people respectively and from different areas of the province of Dhi Qar. A total of 83,50,25 persons were found to have positive results for syphilis using ELISA and cassette Method rate (158). While in the main blood bank (2015,2016,2017) among male donors, the number of people (32,600, 28,200 and28,250) respectively, and from different areas of Dhi Qar Governorate, found that 149,148,100 persons respectively showed positive results rate (397). The rate of syphilis at the marriage examination unit in 2015 was higher than in 2016 and 2017, while in the main blood bank the rate of infection in 2016 was higher than in 2015 and 2017. The study also showed that syphilis data for (2015,2016,2017) that the most infected people from the center of the province of Dhi Qar (Nasiriyah) more than the districts (shatrah, Rifai ,suq-alshuyukh , AL-Gharaf) , where he recorded the highest infection in Nasiriyah for three consecutive years (197 ,171 ,104) and recorded less infection Garraf for three consecutive years (5 ,1 ,0 ). According to the age group, the highest incidence was among those who were married (80) in the age group (25-35) and the lowest infection (13) in the age group (55-63), while among the male donors blood bank highest (212) in the age group (35-45) and the lowest (34) among the age group (25-35).

Keywords: Serological diagnosis; syphilis; marital examination unit; blood bank; Teaching Al-Haboubi Hospital

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1. Introduction

Treponema Pallidum(TP) is the causative agent of the venereal disease syphilis [1]. T. pallidum belongs to a family of spiral-shaped bacteria, the Spirochaetaceae (spirochetes) [2]. T. pallidum varies from 6 to 15 μm in length and is 0.2 μm in diameter[3]. In both clinical and laboratory settings, dark-field microscopy is used for visualization of this small organism. The spiral-shaped body of T. pallidum is surrounded by a cytoplasmic membrane, which is enclosed by a loosely associated outer membrane. A thin layer of peptidoglycan between the membranes provides structural stability. Endo flagella, organelles that allow for the characteristic corkscrew motility of T.pallidum, are located in the periplasmic space [4].

Syphilis is a chronic sexually transmitted disease caused by T. pallidum[5]. Syphilis can be passed from one person to another during sex and by direct skin contact with someone who has syphilis sores or a syphilis rash .It can be passed on before symptoms are noticeable ,or after they've disappeared or transmitted by blood transfusion .However ,in the UK all blood donors are screened to detect this before the blood is used [6].risk of transmission through blood is negligible due to improved donor selection, uniform serologic testing of all blood donors, and a shift from transfusion of fresh blood to transfusion of refrigerated blood components [7]. pregnant mother with syphilis to fetus. Congenital syphilis causes spontaneous abortion, stillbirth, death of the neonate, or disease in the infant [8].
Studies have shown that 16 to 30% of individuals who have had sexual contact with a syphilis-infected person in the preceding 30 days become infected [9] actual transmission rates may be much higher [10].

Syphilis declined to 31,575 reported infections, with alternating peaks and troughs of infectious cases. Since 2000, there has been an increase in the number of syphilis cases in the United States, mainly among men who have sex with men (MSM) [11], these outbreaks have been reported along the west coast of the United States and in New York. Similar increases in syphilis in MSM have been reported in western Europe and the United Kingdom [12].

The annual mortality rate per 100,000 people from syphilis in Iraq has decreased by 28.1% since 1990, an average of 1.2% a year for men, the deadliness of syphilis in Iraq peaks at age 75-79. It kills men at the lowest rate at age 50-54. Women are killed at the highest rate from syphilis in Iraq at age 70-74. It was least deadly to women at age 50-54. At 0.7 deaths per 100,000 women in 2013, the peak mortality rate for women was higher than that of men, which was 0.6 per 100,000 [13].

The serological detection of specific antibodies to T. pallidum has been long recognized in the diagnosis of syphilis since the nature course of the infection is characterized by periods without clinical manifestations. The antibodies response to T. pallidum can be detected within 4 to 7 days after the syphilis chancre appears, allowing the early detection and diagnosis of syphilis infection[14]. Rapid Screen Test (Cassatt) is a qualitative test for the detection of antibodies to T. pallidum in human serum, plasma and whole blood. All positive specimens must be confirmed with Western Blot or other qualified ELISA[15]. ELISA, Indirect immune enzyme assay to test IgG+IgM antibodies against T.pallidum in human serum/plasma, used as confirmatory test for syphilis. they have sensitivities and specific icities similar tothose of the other treponemal tests [16]. aim of the study, Serological Diagnosis of syphilis by Cassette and Elisa Method, Determining the number of patients with syphilis to refer patients to the marital screening unit and to people who donate blood bank.

2. Material & Methods

Sero logical diagnosis

Cassette Test Ultra Rapid Diagnosis Syphilis

**Principle:** The Syphilis Ultra Rapid Test Device (whole blood/serum /plasma) is a qualitative membrane based immunoassay for the detection of T.Pallidum antibodies(IgG and IgG) in whole blood,serum or plasma . In this test procedure ,recombinnant syphilis antigen is immobilized in the test line region of the test .After specimen is added to the specimen well of the device ,it reacts with syphilis antigen coated particles in the test .This mixture migrates chromatographically along the length of the test and interacts with the immobilized syphilis antigen.The double antigen test format can detect both IgG and IgM In Specimens .If The Specimens contains T.Pallidum antibodies , a colored line will appear in the test line region ,indicating a positive result .If the specimen does not contain T.P antibodies ,a colored line will not appear in the region, indicating a negative result. To serve a procedural control, a colored line will always appear in the control line region. If the control line does not appear the test result is not valid.

![Figure (1) Cassette Test kit](image)
Materials Provided include Test Devices, Buffer (For Whole Blood Only), Droppers, Package Insert and Materials Required but Provided, Specimen collection containers, Lancets (for fingerstick whole blood only), Heparinized capillary tubes and dispensing bulb (for fingerstick whole blood only), Centrifuge, Timers

**Procedure:** 1. Bring the pouch to room temperature before opening it removes the test device from the sealed pouch and use it as soon as possible.

2. **place the device on a clean and level surface:** For serum or plasma specimen: Hold the dropper vertically and transfer 3 drops of serum or plasma (approximately 75µL) to the specimen well and start the timer. For venipuncture whole blood specimen, to use a capillary tube, Fill the capillary tube and transfer approximately 50µL of fingerstick whole blood specimen to the specimen well of test device, then add 1 drop of buffer (approximately 40µL) and start the timer. To use hanging drops: Allow 2 hanging drops of fingerstick whole blood specimen (approximately 50µL) to fall into specimen well of test device, then add 1 drop of buffer (approximately 40µL) and start the timer.

3. Wait for the colored lines to appear, read results at 10 minutes. Do not interpret the result after 30 minutes.

**Elisa Test for The Diagnosis of Syphilis**

**Principle:** The Syphilis total antibody EIA test Kit is a solid qualitative enzyme immunoassay based on a sandwich principle for the detection of total antibody (IgG, IgM, IgA) to *Pallidum* (T.P) in human serum or plasma. The microwell plate is coated with recombinant antigens for T.P. During testing, the specimen and the enzyme–conjugated T.P antigens are added to the antigen coated microwell plate and then incubated. If the specimen contains antibodies to T.P, it will bind to the antigen coated on the microwell plate and simultaneously bind to the conjugate to form immobilized antigen–T.P–conjugate complexes. If the specimen does not contain antibodies to T.P, the complexes will not be formed. After initial incubation, the microwell plate is Substrate B are added and then incubated to produce a blue color indicating the amount of T.P antibodies present in the specimen. Sulfuric acid solution is added to the microwell plate to stop the reaction producing a color change form blue to yellow. The color intensity which corresponds to the amount of T.P antibodies present in the specimen is measured with a microwell plate reader at 450/630-700nm or 450nm.

**Reagents And Components**

<table>
<thead>
<tr>
<th>Reagent</th>
<th>Component</th>
<th>96wells/Kit</th>
<th>480wells/kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis microwell plate</td>
<td>Microwell plate coated with T. pallidum antigens</td>
<td>1 plate</td>
<td>5 plate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>96 wells/plate</td>
<td>96 wells/plate</td>
</tr>
<tr>
<td>1 Syphilis conjugate</td>
<td>Recombinant T. Pallidum antigens bound to peroxidase.</td>
<td>1x8ML</td>
<td>5x8ML</td>
</tr>
<tr>
<td></td>
<td>Preservative 0.1% proclir300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Concentrated wash buffer.</td>
<td>Tris-HCL buffer containing 0.1% Tween20</td>
<td>1x40ML</td>
<td>5x40ML</td>
</tr>
<tr>
<td></td>
<td>- preservative 0.1% proclir300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 SubstrateA</td>
<td>Citrate-phosphate buffer containing hydrogen peroxide.</td>
<td>1x8ML</td>
<td>5x8ML</td>
</tr>
<tr>
<td></td>
<td>Preservative 0.1% proclir300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Materials Required But Not Provided:
Sodium hypochlorite solution or decontamination Freshly distilled or deionized water, Absorbent paper or paper towel, Water bath or incubator capable of maintaining 37°C±2°C, Calibrated automatic or manual microwell plate, Washer capable of aspirating and dispensing 250μL/well, Disposable gloves, Calibrated micropipettes with disposable tips capable of dispensing 50μL, Graduated cylinders for wash buffer dilution, Vortex mixer for specimen mixing (optional), Disposable reagent reservoir, Calibrated microplate reader capable of reading at 450nm with 630-700nm reference filter, or reading at 450nm without reference filter, Timer.

### Procedure:
Prepare working wash buffer by diluting the concentrated wash buffer 1:25, pour the contents of the bottle containing the concentrated wash buffer in a graduated cylinder and fill it with freshly distilled or deionized water to 1000mL for 96 wells/plate testing. The working wash buffer is stable for 2 weeks at 15-30°C. Leave A1 as Blank well.

1. Add 50mL OF Negative control in wells B1 and C1 (Blue Reagent)
   • Add 50mL of positive control in wells D1 and E1 (Red Reagent)
   • Add 50μL of specimen to assigned wells starting at F1.

2. Add 50μL of conjugate to each well except for the Blank well (Red Reagent)

3. Mix gently by swirling the microwell plate on a flat bench for 30 seconds.
   • Cover the microwell plate with the plate sealer and incubate in a water bath or an incubator at 37°C±2°C for 60 minutes ±2 minutes.

4. Remove the plate sealer.
   • Wash each well 5 times by filling each well with 350mL of working wash buffer, then remove the liquid.
   • Turn the microwell plate upside down on absorbent tissue for a few seconds. Ensure that all wells have been completely washed and dried.

5. Add 50μL of substrate A to each well (clear Reagent).
   • Add 50μL of substrate B to each well (Clear Reagent)

<table>
<thead>
<tr>
<th></th>
<th>Substrate B</th>
<th>Buffer containing tetramethyl benzidine (TMB). preservative; 0.1% proclir300-</th>
<th>1X8</th>
<th>5X8mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Stop Solution</td>
<td>0.5M Sulfuric acid</td>
<td>1x8mL</td>
<td>5X8mL</td>
</tr>
<tr>
<td>5</td>
<td>Syphilis Negative control.</td>
<td>Normal serum non-reactive for syphilis, HCV, HbsAg, HIV-1 and HIV-2.</td>
<td>1x1mL</td>
<td>5X1mL</td>
</tr>
<tr>
<td>6</td>
<td>Syphilis positive control.</td>
<td>Inactivated serum containing antibodies to T. Pallidum and Negative for HCV, HbsAg, HIV-1, HIV-2.</td>
<td>1X1mL</td>
<td>5X1mL</td>
</tr>
</tbody>
</table>

Plate sealer

Package inserts.
• Then a blue color should develop in wells containing positive specimen.

Collection of Data

Data were collected for applicants for marriage examination at Al-Haboubi Teaching Hospital in Dhi Qar Governorate for three years (2015, 2016, 2017) and was the total number on respectively (2400, 2000, 1600). As well as blood donors to the main blood bank for three years (2015, 2016, 2017) and was the total number on respectively (32,600, 28,200, 28,250).

3. Results

**Explain the result of a cassette test**

*Negative:* Only one line appears at the control region C. The absence of a line in the test result line region (T) indicates that no syphilis antibodies are detected.

*Positive:* Two line appear. One line is the control region C (control line), The other one in the test result line region T. A red test result in the T region indicates that sample contain syphilis antibodies. The color intensity of the test result (T) may vary from faint pink to an intense burgundy.

*Invalid:* No control line develops the assay is invalid event it the test result line (T) is formed. In this case, repeat the assay with new test devices

![Figure (2) Result of a cassette test](image)

**Limitation of the test**

• The syphilis rapid screen test is limited to the qualitative detection of syphilis antibody in human serum, plasma and whole blood.

• The test is a qualitative screening assay only and should not be used for quantifying the amount of anti-syphilis antibodies according to the color intensity or width of the test result line.

• A negative result does not rule out syphilis infection because the antibodies against T. pallidum may be absent at the time the specimen is taken or may not be present in sufficient quantities to be detected at an early stage of infection.

• As with all diagnosis tests, all result must be interpreted together with other clinical information and should not be used as sole basis for diagnosis. The results obtained with this test should only be used as an adjunct to other diagnostic procedure and information available to the physician.

• It is possible that the test does not yield any results if whole blood specimen has a high viscosity or if the whole blood specimen has been stored for more than 2 days. In this case the test should be repeated with a new test card using a plasma or serum specimen of the same patient.
3.2 Interpretation of results by Elisa

Non-reactive: Specimen with absorbance less than the Cut-off value are considered non-reactive for antibodies to *T. pallidum* and may be considered negative.

Reactive: Specimen with absorbance greater than or equal to the Cut-off value are considered initially reactive for antibodies to *T. pallidum*. The specimen should be retested in duplicate before final interpretation. Specimen that are reactive in at least one of the re-tested are presumed to be repeatedly reactive and should be using confirmatory testing. Specimens that are non-reactive on both tested should be considered non-reactive.

![Image](image_url)

**Figure (3) Interpretation of positive result by Elisa**

*Note:* - specimens with value within ±10 of the cut-off value should be retested in duplicates for final interpretation.

3.2.1 Limitations

1. The syphilis total antibody EIA test issued for the detection of *T. Pallium* antibodies in human serum or plasma. Diagnosis of an infectious disease should not be established based on a single test result. Further testing inducing confirmatory testing. Should be performed before a specimen is considered positive. A non-reactive test result does not exclude the possibility of exposure. Specimen is containing precipitate may give inconsistent test results.

2. As with all diagnosis tests, all results must be interpreted together with other clinical information available to the physician.

3. As with other sensitive immunoassays, there is the possibility that non-repeated reaction may occur due to inadequate washing. The results may be affected due to the procedural or instrument error.

4. The positive control in testis not be used to quantify assay sensitivity. The positive control is used to verify that the testcomponents are capable of detecting a reactive specimen.

3. Prevalence of syphilis infection among blood donors and blood bank prevalence of syphilis infection among blood donors and applicants to marriage at Thi-Qar governate. 149, 148 and 100 individuals referred to number of patient's at main blood bank in 2015, 2016 and 2017 as show in (Table 2).

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>149</td>
</tr>
</tbody>
</table>

Table 2. Distribution of patients with syphilis by year in the main blood bank.
<table>
<thead>
<tr>
<th>Year</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>83</td>
</tr>
<tr>
<td>2016</td>
<td>50</td>
</tr>
<tr>
<td>2017</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
</tr>
</tbody>
</table>

(Table 3) show the distribution of syphilis during 3 years in clinic examination of applicants to marriage. 83, 50, 25 Respectively

**Table 3. distribution of patients with syphilis by year from examination of married**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-35</td>
<td>34</td>
<td>8.56%</td>
</tr>
<tr>
<td>35-45</td>
<td>212</td>
<td>53.40%</td>
</tr>
<tr>
<td>45-55</td>
<td>99</td>
<td>24.93%</td>
</tr>
<tr>
<td>55-63</td>
<td>52</td>
<td>13.1%</td>
</tr>
<tr>
<td>Total</td>
<td>397</td>
<td>100%</td>
</tr>
</tbody>
</table>

(The-4) show the frequency distribution of syphilis in main blood bank according to age groups of patients ranged from 25 years old to 63 years old, the age-group (35-45) of patient's show the highest frequency (53.40%) with syphilis.

**Table 4. distribution of patients with syphilis by age in main blood bank.**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25-35</td>
<td>80</td>
<td>50.63%</td>
</tr>
<tr>
<td>35-45</td>
<td>37</td>
<td>23.41%</td>
</tr>
<tr>
<td>45-55</td>
<td>28</td>
<td>17.72%</td>
</tr>
<tr>
<td>55-63</td>
<td>13</td>
<td>8.23%</td>
</tr>
<tr>
<td>Total</td>
<td>158</td>
<td>100%</td>
</tr>
</tbody>
</table>

(Table-5) show the distribution of syphilis in clinic examination of applicants to marriage according to age groups of patients ranged from 25 to 63 years old, the age group (25-35) of patient's show the highest frequency (50.63%) with syphilis.

**Table 5. distribution of patients with syphilis by age in unit of examination of married.**

The present study in Al-Heboubi hospital was revealed that out of 2400, 2000, and 1600 in 2015, 2016, and 2017 individuals, 83 (3.45%), 50(2.5%) and 25 (1.56%) of those gave positive result for syphilis infection by ELISA technique respectively. As shown in table (6)

**Table 6. total Number of people undergoing the examination of married with in3 years at teaching Al-Heboubi hospital**
<table>
<thead>
<tr>
<th>Year</th>
<th>No.positive test</th>
<th>No.negative test</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>83(3.45%)</td>
<td>2317</td>
<td>2400</td>
</tr>
<tr>
<td>2016</td>
<td>50(2.5%)</td>
<td>1950</td>
<td>2000</td>
</tr>
<tr>
<td>2017</td>
<td>25(1.56%)</td>
<td>1575</td>
<td>1600</td>
</tr>
</tbody>
</table>

The present study in Al-Heboubi hospital was revealed that out of 32,600, 28,200, and 28,250 in 2015, 2016, and 2017 individuals, 149 (0.5%), 148(0.52%) and 100 (0.4%) of those gave positive result for syphilis infection by ELISA technique respectively. As shown in table (7)

Table 7. total Number of blood donors to the main blood bank during 3 years at teaching Al-Heboubi hospital

<table>
<thead>
<tr>
<th>Year</th>
<th>No.positive test</th>
<th>No.negative test</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>149(0.5%)</td>
<td>32,451</td>
<td>32,600</td>
</tr>
<tr>
<td>2016</td>
<td>148(0.52%)</td>
<td>28,052</td>
<td>28,200</td>
</tr>
<tr>
<td>2017</td>
<td>100(0.4%)</td>
<td>28,150</td>
<td>28,250</td>
</tr>
</tbody>
</table>

The result of the statistical analysis showed the highest percentage of infection was at Al-Nassiriyah (472) and lowest percentage was at Al-Gharaf (6) from total infection (555) as it is shown in table (8).

Table 8. distribution of syphilis by region in Thi-Qar Governorate for 2015-2017 (blood bank and married)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of patients 2015</th>
<th>Number of patients 2016</th>
<th>Number of patients 2017</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nassiriyah</td>
<td>197</td>
<td>171</td>
<td>104</td>
<td>472</td>
</tr>
<tr>
<td>Shatrah</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Rifai</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>Suq al-shuyukh</td>
<td>16</td>
<td>16</td>
<td>9</td>
<td>41</td>
</tr>
<tr>
<td>Gharaf</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>232</td>
<td>198</td>
<td>125</td>
<td>555</td>
</tr>
</tbody>
</table>

Table 9. The number of infected with syphilis in Dhi-Qar governorate during 2015 - 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Positive result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>232</td>
</tr>
<tr>
<td>2016</td>
<td>198</td>
</tr>
<tr>
<td>2017</td>
<td>125</td>
</tr>
<tr>
<td>Total</td>
<td>555</td>
</tr>
</tbody>
</table>

Table 10. % infected syphilis in Nassiriyah during 2015-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>84.91%</td>
</tr>
<tr>
<td>2016</td>
<td>86.36%</td>
</tr>
</tbody>
</table>
4. Discussion

Serological tests for syphilis are important because they contribute to the diagnosis of the disease and in this study used cassette method and Elisa. The tests were conducted at the Married Examination Unit at Al-Haboubi Hospital ELISA may be an alternative to the treponemal tests for the detection of *T. pallidum* antibodies, including the presence of IgM, since it has a sensitivity and a specificity similar to those of the most commonly used tests during all stages of syphilis [17].

application of EIA methodology (especially ELISA) to syphilis serology has some advantages over the conventional flocculation screening tests of RPR or VDRL. The microtiter plate ELISA method is designed to handle a large volume of samples, and has the potential to be automated. Also, the reading of ELISA results is usually carried out by a microtiter plate reader, thus making the interpretation of results objective, in direct contrast to the reading of flocculation tests of RPR/VDRL, which is subjective and hence requires the technologists to have extensive experience. Unlike the RPR and VDRL tests, which are affected by the prozone phenomenon and therefore give false-negative results due to high antibody levels in the test samples, EIAs/ELISAs are not affected by the prozone phenomenon in such samples. Therefore, undiluted serum samples giving weakly reactive or atypical negative RPR or VDRL reactions need to be tested again with dilutions for confirmation. Furthermore, treponemal antigen-based syphilis EIA is designed to detect specific antibodies to *T. pallidum* regardless of the stage of infection and prior treatment [18]. Therefore, EIAs with the recombinant *T. pallidum* antigens have certain attractions as screening tests for syphilis, especially in areas with a low prevalence of disease [19].

The quality of the testing programmed depends on the quality of the test kits and the proficiency of the end-users at performing the tests. A number of steps should be considered in the evaluation of the testing programmed: Quality Control on validity of test kits Since temperatures that the test kits are subject to during transport may affect the sensitivity of the tests, the sensitivity of rapid tests should be checked at a central laboratory with a well-characterized quality control panel on receipt from the manufacturer. Instructions for processing and interpretation should be clear, including biosafety issues associated with finger pricking procedures.

it is not possible to culture *T. pallidum* on artificial media, the detection of serum antibodies is often used as surrogate markers of *T. pallidum* infection. As mentioned previously, these tests fall into 2 categories: Non-treponemal tests such as the VDRL (Venereal Disease Research Laboratory) or the RPR (Rapid Plasma Reagin) detect antibodies to a lipoidal antigen, resulting from the interaction of the host with *T. pallidum* or from *T. pallidum* itself. These tests are widely used because of their low-cost and are relatively easy to perform. However, non-treponemal tests may give false positive results. Hence positive treponemal test results may need to be confirmed using treponemal tests. Some common conditions associated with false-positive test Potential causes of cross-reactivity Infectious causes Malaria, Tuberculosis, Viral fevers, Trypanosomiasis, Leprosy and Other treponemes Non-infectious causes Drug addiction, Connective tissue disease, Pregnancy, Advanced age.

Treponemal Tests The most frequently used tests are the TPHA (T. pallidum hemagglutination), the TPPA or the FTA-ABS. When positive, these tests are considered evidence of a previous or current infection with *T. pallidum*. These are laboratory-based tests that require equipment and trained staff to perform. They will remain positive for life in a person that previously had syphilis. A new generation of these tests in an ELISA format is now commercially available. These tests can be batched for high throughput testing. Sensitivity and specificity of a test are not the only parameters of importance in evaluating its appropriateness in a given population. The prevalence of the disease is important in assessing its positive and negative predictive value. The predictive value of the same test can differ between countries and between different populations in the same country [20].

Invalid test of cassette means Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test with a
new test Device. If the problem persists, discontinue using the test kit immediately and contact your local distributor.[21]

Table (1) and (2) show increased infection rate in 2015 for what was recorded in 2016 and 2017, due to the lack of awareness and frequent homosexuality [22]. Table (3) show the syphilis prevalence is higher in person with age group (35-55) years than in older or younger person, to the fact that most of the blood donors ranged in age (35-55) and the disease is difficult to diagnose because many of the sign and symptoms are indistinguishable from those that appear with other disease. Also, many of the ulcers remain unnoticed, as does not appear in many people any symptom for years because of the evolution of the disease situation underlying (hidden) after the end of the primary and secondary symptoms, it can show the injury again during 10-20 years of old injury, in this case can be diagnosed the disease.

There were significant differences by gender, with higher rates among men, a finding compatible with data published in the USA [23] China [24] and various European countries [25] that show increased cases in men and particularly in MSM [29]. This could be due to the behavioural changes of this population group, with a decrease in the preventative measurements and the increase of risky sexual practices that favor the infection [26].

Table (4) show the highest infection occur within age group (25-35), To the fact that most applicants for marriage ranged in age (25-35).

Table (6) show the prevalence of syphilis according to regions appears to be concentrated in geographical areas where high density like the center of the governorate Al-Nassiriyah.

The pattern of spread of syphilis in the urban over the rural may be due to the fact that the Urban's population more sophisticated and open in sexual relationships unlike rural’s society and closed, confined to sexual relations only legitimate marital relationship that have contributed to reducing the transmission rates of the disease in the rural community.

The observed association between syphilis and religion, multiple concurrent partners, and wealth was all observed in similar settings. In Tanzanian rural population the traditional religion was also associated with syphilis infection (1.6) [27] and syphilis infection was associated with having concurrent sexual partners (1.8) [18]. In Kenya, researchers found that poorest/poorer and middle/richer were likely significantly associated with syphilis prevalence in males and females [28].

Syphilis is almost passed through sexual contact. It also can be passed from an infected mother to her baby during pregnancy. *T. palladium* can enter the body if you have close contact with an infected sore. Normally during vaginal and oral sex. It may also be possible to catch syphilis if one is an injecting drug user and shares a needle with somebody who is infected.

5. Conclusion

1. We think that the enzyme immunoassay technique studied here could be used as a screening test, since it is simple, objective, and easily automated.
2. The examination unit of the married and the blood bank is a guide for the detection of syphilis.
3. The rate of infection was 158 for people who were getting married while blood donors in the blood bank were 397 higher for three years.
4. 2015 the highest rate of infection in the unit of examination of married while in the blood bank was 2016.
5. The majority of patients with syphilis from Nasiriyah, followed by Suq al-shuyukh.

References


