Bacterial Infections in Thalassemia Patients at Thi-Qar Province/ South Iraq

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Abstract

The present study was carried out from October 2013 to March 2014 to detect the bacterial causative agent causing septicemia in thalassemia patients at Thi-Qar province, represent patients referred to the center of thalassemia / AL-Haboby hospital in Thi-Qar province. The present study was showed that out of 40 blood sample, (25) 62.5% did not show any growth, (15) 37.5% showed growth, and the highest infection was recorded with the *Streptococcus* genus in 9 (60%) sample, and the lowest infection rate was recorded in the *Escherichia.coli* in one sample (6.6%) with significant difference. The results of urine samples showed that among the 40 sample , (22) 55% sample did not show any growth, and (18) 45% sample showed growth, which reported highest infection in *Staphylococcus* genus in 7 (38.88%) samples, followed by *Protues* genus in 6(33.33%) samples, *E.coli* in 4 (22.22%) samples, and then *Pseudomonas* in one sample by (5.55 %) with no significant difference.

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The results showed that among the 20 stool samples, (11) 55% sample did not show any growth, and (9) 45% sample showed growth, the statistical analysis show no significant difference at the level of probability (0.05), the infections distributed as flowing : *Staphylococcus* genus in 2 sample (22.22%), *Protues* genus in 2 sample (22.22%), *Escherichia.coli* in 2 samples (22.22%), *Pseudomonas* in 2 sample (22.22%). and *Enterobacter* in one sample (11.11%).

Keywords: Septicemia; Bacterial infection; Thalassemia; Thi-Qar; Iraq.

1. Introduction

Beta-thalassemia syndromes are a one of hereditary blood disorders characterized by reduced or absent beta globin chain synthesis, resulting in reduced Hb in the erythrocytes, decreased RBC production and anemia. Most thalassemia are inherited as recessive traits[1]. widely spread in the Mediterranean Basin, South- East Asia and various countries in the equatorial Africa. The rate of carriage of beta-thalassemia is >1.1% [2]. With receipt of regular blood transfusions and iron-chelating therapy, the prognosis of the disease improves [3]. There are many complications of thalassemia such as recurrent infections, septicemia, failure to thrive [4]. Septicemia was defined as isolation of microbial species from the blood of a patient who had shown clinical signs of sepsis such as clinical deterioration, fever, unstable hemodynamic parameters or coagulopathy [5]. The outcome of septicemia is influenced by various factors, such as underlying condition and patients age, the microorganisms involved and its source as well as choice of antibiotic therapy, while in developed countries septicemia is mainly hospital acquired reports, indicate widespread community acquired pathogens [6].

This study aimed to reveal the bacterial causative agent causing septicemia in thalassemia patients at Thi-Qar province.

2. Subjects and Methods

2.1. Samples collection

The sample of the study consisted of 40 blood sample , 40 urine sample and 20 stool sample from patients with thalassemia-major (Beta-thalassemia) referred to the center of thalassemia / AL-Haboby hospital in Thi-Qar province in different age and suffering from fever, abdominal pain and vomiting. This study was performed from October 2013 to March 2014.

2.2. Methods of sterilization

2.2.1. sterilization (moist heat)

Moist heat sterilization process. The culture media was sterilized in Autoclave (121° degree of heat for 15 minutes and under the pressure of 1 atmosphere).

2.2.2. sterilization dry heat

Sterilized glass and metal tools in the electric oven at a temperature of 180 ° for two hours.

2.3. Prepare of culture media

2.3.1. Blood agar Base

This media was prepare acoriding to the manufacturer's instructions and sterilited by autoclave for 15 minutes degree ° 121 m and pressure 1 atmosphere and added to human blood by 5%, after cooled to a temperature of about 45 ° m, and use this medium for the detection of susceptibility of isolates to produce the enzyme case (Haemolysin).

2.3.2. MacConkey's agar

Prepared according to the manufacturer's instructions and sterilited by autoclave for 15 minutes and the degree of 121° C, then left to cool to 45 degrees m then presented in a sterile dishes and keeping it in the fridge degree 4 ° m until use. This media has been used in the initial isolation for gram negative bacteria , as it is diffrential media between gram negative bacteria fermented lactose and non fermented to it.

2.3.3. Oxidase reagent solution solution

preperd by dissolving 1 g of material (Tetra methyl para phenylene Diamine Dihydrochloride) (NNNN) in 90 mL of distilled water and fuller size to (100) mL to be the final 1% and then save the solution concentration in a sterile bottle in a dark place until use.

2.4. Diagnosis of isolated bacteria

Bacterial isolates were identified to the level of species using microscopic, cultural characteristics and conversional biochemical test [7, 8].

2.4.1. Growth characteristics

studied the properties of developing colonies in terms of shape and size and color, smell, texture and fermentation of sugars such as lactose and mannitol, analyze the blood of different types on the community blood agar , MacConkey and mannitol to study the phenotypic traits gram negative bacteria.

2.4.2. Microscopically test

The transfer a part of developing pure colonies age 24-18 hour by mediated loop to a glass slide placed on a drop of distilled water, and published on an area of the surface of the slide has been and colored by gram stain. Were then examined under a microscope oil lens scanner to distinguish between the form of the cells and be positive and negative of gram stain.

2.4.3. Biochemical tests

To diagnosis isolates carried out following biochemical tests and according to the follows: -

2.4.3.1. Catalase test

This test is done by Place a small amount of growth from your culture onto a clean microscope slide. Add a few drops of H2O2 onto the smear.

2.4.3.2. Coagulase test

Dense suspensions of Staphylococci from culture are made on two ends of clean glass slide. One should be labeled as "test" and the other as "control". The control suspension serves to rule out false positivity due to auto-agglutination. The test suspension is treated with a drop of citrated plasma and mixed well. Agglutination or clumping of cocci within 5-10 seconds is taken as positive.

2.4.3.3. Oxidase test

This test is done by taking a sample of bacteria grown on the developing central Alakar nutritious record to be developing colonies age of 24-hour-mediated sterile wooden stick on filter paper moistened detector oxidase, The emergence of violet indication of the positive test.

2.4.3.4. Indol production test

This test is done by inoculating a small amount of growth from your culture in peptone water pipes and incubated in °37 for 24 hours, then added a drop of reagent Kovac's reagent, the appearance of a red ring proof positive result.

2.5. Statistical analysis

Analysis of data was done by using a computer with the available statistical packages for social science-version 11 (SPSS). Chi-Square (X^2) were used to assess these significant differences on $p > 0.05$ [9].

3. Finding and Discussion

The current results showed that among the 40 blood sample, (25) 62.5% did not show any growth, (15) 37.5% showed growth, and recorded the highest infection with the *Streptococcus* genus in 9 (60%) sample, followed by *Salmonella* genus in three samples (20%), and *Staphylococcus* genus in two samples (13.3%), and the lowest infection rate was recorded in the *Escherichia.coli* in one sample (6.6%) statistical analysis showed significant difference at the level of probability (0.05) (figure 1).

One of the main causes of contamination of blood in patients with thalassemia are Splenectomy process as a result of the spleen amplified (Increased red blood cells break inside it), also repeated blood transfusions t, when the blood may be contaminated considered cause of septicemia. The encapsulated organisms such as *Streptococcus* genus of the common causes of contamination of the blood as well as *Bacillus* gram negative

bacteria such as Salmonella and *Escherichia coli* [10, 14].
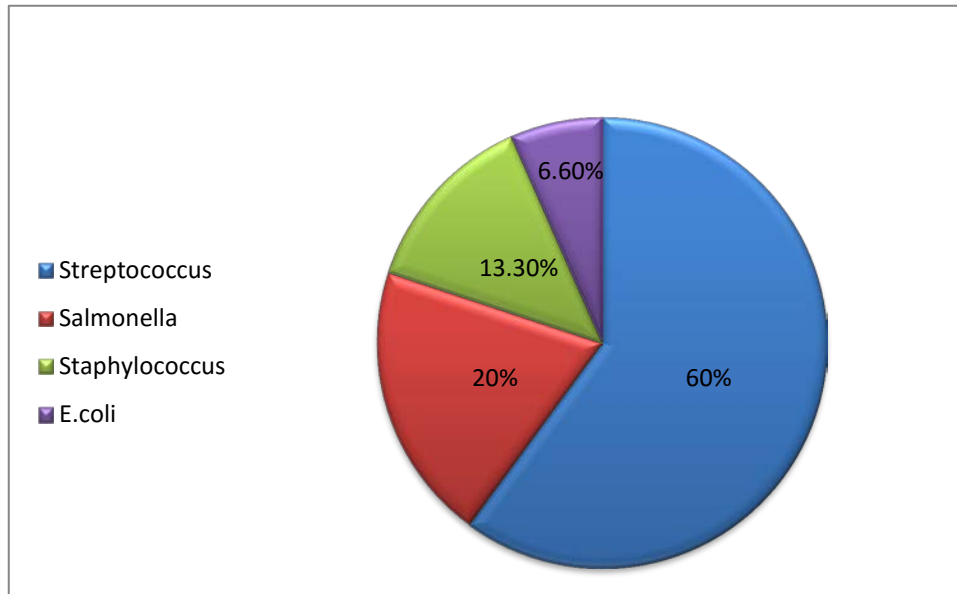
X^2 calculated: 10.332 X^2 referential: 7.814   df=3

Figure 1: Bacterial Isolations from blood sample of thalassemia patients

The results showed that among the 40 urine samples , (22) 55% sample did not show any growth, and (18) 45% sample showed growth, statistical analysis showed no significant difference at the level of probability (0.05), which reported highest infection in *Staphylococcus* genus in 7 (38.88%) samples, followed by *Protues* genus in 6(33.33%) samples, *Escherichia.coli* in 4 (22.22%) samples, and then *Pseudomonas* in one sample by (5.55 %).
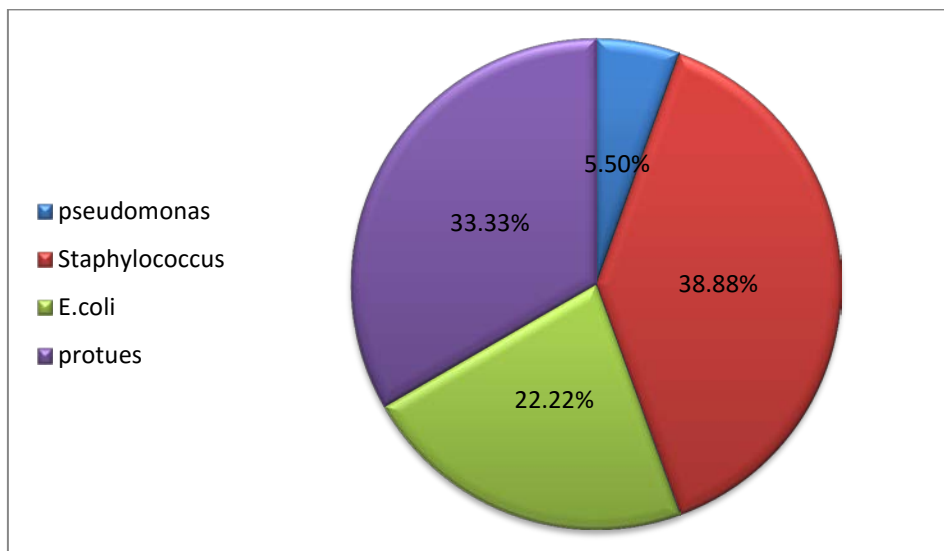

X^2 calculated: *4.666* X^2 referential: *7.814*   df=3

Figure 2: Bacterial Isolations from urine samples of thalassemia patients

One of the main causes of urinary tract infection and kidney abscesses was infection with *Staphylococcus* and *Escherichia.coli* that considered normal flora in the intestines, but when its presence in other places cause many diseases including urinary tract infection [10, 11, 15].

The current study showed that among the 20 stool samples, (11) 55% sample did not show any growth, and (9) 45% sample showed growth, the statistical analysis show no significant difference at the level of probability (0.05), the infections distributed as following : *Staphylococcus* genus in 2 sample (22.22%), *Protues* genus in 2 sample (22.22%),   *Escherichiacoli* in 2 samples (22.22%), *Pseudomonas* in 2 sample (22.22%). and *Enterobacter* in one sample (11.11%).
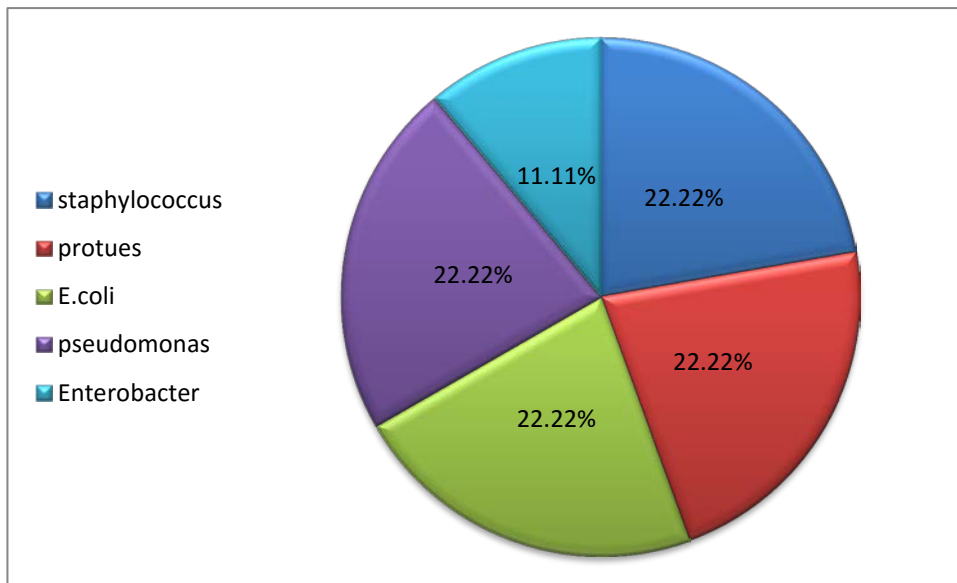
X^2 calculated: *0.777* X^2 referential: *9.48*   df=4

Figure 3: Bacterial Isolations from stool samples of thalassemia patients

Many different types of bacteria can cause inflammation of the stomach and intestines, including *Staphylococcus* , *Escherichia.coli* , *Proteus*, *pseudomonas* and *Enterobacter* [12] . Some sources of infection may be from contaminated water and non-minutes food correctly, and the deteriorating health status and reduced immunity makes thalassemia patients susceptible to inflammation of the stomach and intestines [13, 16].

4. Conclusion

Our results have showed that the highest infection in blood cultures was recorded with the *Streptococcus* genus and the lowest infection rate was recorded in the *Escherichia.coli* . The results of urine samples which reported highest infection with *Staphylococcus* genus and the results showed that among the stool samples, recorded following bacterial genus *Staphylococcus* genus in 2 sample , *Protues*, *Escherichia.coli*, *Pseudomonas* and *Enterobacter* .

Acknowledgment

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