ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Published by JK Welfare & Pharmascope Foundation Journal Home Page: www.ijrps.com

Isolation of *Staphylococcus xylosus* from Urinary Tract Infection in Al-Diwaniya City, Iraq

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Article History:

Received on: 15.09.2019
Revised on: 23.09.2019
Accepted on: 03.10.2019

Keywords:

streptococcus, staphylococcus, Al-Diwaniyah, Hospital, Iraq

ABSTRACT

One hundred diuresis samples were collected from patients with urinary tract infection from Al-Diwaniyah General Teaching Hospital in Al-Diwaniyah city for the period from January 1, 2019, to August 1, 2019, as 35 isolates belonging to the sex of streptococcus were isolated and with an isolation rate of 35% of the total 100 diuresis samples, The yield of 20 isolates to the negative staphylococcus aureus was tested for cocaine, and 5 isolates were of type S. xylosus, with an isolation rate of 25% of the total negative staphylococci for testing cocaine, and by 5% of the total of the reagent samples. These biochemical bacteria were diagnosed using the API Staph system . The clinical stages of the infection are in the subacute or chronic phase without clear symptoms. Streptococcus unproductive streptococcus resistant and anti-life antibody novobiocin, especially S. saprophyticus, are most common in urinary tract infections in immunocompetent patients, and mild infection in women is accompanied by dysuria. Young women between the ages of 16-16 years old to 42%. It affects the ureter in men. It can cause cystitis, pyelonephritis and glomerulonephritis. This group possesses a high affinity to epithelial cells, and this comes from the participation of different proteins such as a 160-Kd protein with Hemagglutinin and Fibriller protein, and it is symbolized by 95-Kd, which is found in 98% of clinical isolates.

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ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11i1.1890

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INTRODUCTION

Streptococcus aureus (CoNS) includes a wide range of bacteria that are found as natural fluorescents, where the skin and mucous membranes of humans and most of the milk and birds are endemic (Hauschild, 2001; Nagase *et al.*, 2002). Blood culture is often isolated in clinical microbiology laboratories from hospitalized patients who use medical catheters inside the blood vessels and is a major pollutant of the culture media (Huebner *et al.*, 1999; Finch, 2006). CoNS was also isolated from animal skin and nails, such as goats, pigs, and sheep (Devriese *et al.*, 1985). CoNS began to emerge as nurses when using Intravascular catheters, when using alternatives in patients under intensive treat-

ment, in newborns, and in organ transplants. Clinical symptoms caused by CoNS differ significantly from the clinical symptoms of injuries caused by S. aureus, as the symptoms caused by CoNS are usually hidden and non-specific (Subtle and nonspecific). The clinical stages of the infection are in the subacute or chronic phase without clear symptoms (Voneiff *et al.*, 1998). Streptococcus unproductive streptococcus resistant and anti-life antibody novobiocin, especially S. saprophyticus, are most common in urinary tract infections in immunocompetent patients, and mild infection in women is accompanied by dysuria. Young women between the ages of 16-16 years old to 42%. It affects the ureter in men. It can cause cystitis, pyelonephritis and glomerulonephritis. This group possesses a high affinity to epithelial cells, and this comes from the participation of different proteins such as a 160-Kd protein with Hemagglutinin and Fibriller protein, and it is symbolized by 95-Kd, which is found in 98% of clinical isolates.

Staphylococcus xylosus

S. xylosus bacteria live by throwing on the skin of lactobacillus (such as pigs, horses, cows, poultry, cows, and laboratory mice) and pigeons, in the form of natural flora, rarely isolated from humans, and transmitted to humans in a transient way from animals, unlike S. epidermidis, And S. warneri, which are natural fluorides on human skin (Kubošková *et al.*, 2004).

This bacterium is characterized by being anaerobic, a non-productive choice for the cozolase enzyme whose diameters range from 1.2-0.8 mm, and white colonies on blood agar and antibiotic resistance Novopiocene have the ability to grow at a concentration of 7.5% of table salt, possess an enzyme of phosphatase and grow anaerobically over the medium of thioglycolate (Thioglycolite)). Fermentation of various types of sugars, including xylose sugar, of which the name of these bacteria came (Conrad and West, 1984; Bascomb and Manafi, 1998). The cells of these bacteria are arranged and appear under the microscope in the form of pairs organized as pairs, singles or quadruples, and coking acid is attached to the cell wall of polyserine and cholesterol (Ewaid *et al.*, 2020). The strains of these bacteria grow at a temperature between 10–40 ° C and an optimum temperature of 25–35°C (Chalap and Al-Awsi, 2019). Most of these strains do not have Protease, and exogenous DNase or Hemolysin, while they have the ability to produce B-glucosidase, B-glucuronidase, and B-galactosidase, and these are distinctive traits that distinguish S. xylosus, S. cohnii, And S. saprophyticus. The colors of the colonies are orange-yellow or whitish-gray (Katzif *et al.*, 2005). Undulate, or Crenate on the soft surface, 0.7-0.4%. Colonial growth under optional anaerobic conditions, and growth in aerobic conditions on slant mediums from medium to profuse. The ideal pH of fermentation of glucose 5.6-4.9 and bacteria produce a similar enzyme catalase The product of S.saprophyticus enzyme Alcatalaz and the proportion of G + C product in DNA is between 36-30 Mall, a few of them and the strains of glucose fermentation are weak (Schleifer *et al.*, 1979). These bacteria produce acetoin in a small amount or do not produce it, and some strains produce mannitol at high levels as an intracellular metabolite of glucose metabolism, balanced with other strains that produce it at lower levels. This bacterium has high biochemical effectiveness, as S. xylosus produces many acids from different types of carbohydrates, acids produced aerobically from glucose, xylose, mannitol, maltose, sucrose, fructose, and cllicerol. About 80% of the strains produce acid from trehalose, lactose, and galactose. And arabinose, most strains do not need a nitrogenic source but need vitamin B for growth.

MATERIALS AND METHODS

Samples were collected for the period from January 1, 2019, to August 1, 2019, Al-Diwaniyah General Teaching Hospital in Al-Diwaniyah city, where 100 samples were collected in the mid-stream urine from patients with urinary tract infection of both sexes, whose ages ranged between 50-15 years. Samples were collected in clean and sterile glass containers and transferred to the laboratory directly.

Isolate the bacteria

The release samples were planted directly on the blood agar medium, and on the mannitol salt agar medium by means of a sterile transporter (Loop), incubated with air conditions at 37°C for 24 hours, after which the individual colonies developed on the medium of the mannitol agar were transported Al-Mali to Nutrient agar to ensure its purity and study the characteristics of the growing colonies, such as the size, color, strength and edge of the colonies.

Diagnosis of isolates

Bacterial isolates were diagnosed depending on. Microscopic and biological tests were performed based on (Macfaddin, 2000).

API Staph system used in the diagnosis of Staphylococcus xylosus

This system consists of 20 warehouses, each containing Dehydrated ingredients.

1. Preparation of Strip: Place 5 milliliters of distilled water in the groove at the edge of the strip to create wet conditions inside the container.
2. Preparation of inoculum: We took a clean, isolated colony from the center of the nourishing agar and was stuck in a tube containing 6 milliliters of API Staph medium and mixed well.

Inoculation of strip

A- Fill the bottom and top of the microtube with the bacterial trap with a Pasteur pipette.

B- The bottom part was only filled with tubes containing ADH and URE, the top parts of which were filled with drops of sterile liquid paraffin oil to make the conditions anaerobic, and then closed the container with its lid, incubated at 37°C for 24 hours

Reading the strip

After the lapping period ends, the following reagents are added:

1. 0.8 % Sulfanilic acid in 5N acetic acid
2. 0.6 % Dimethyl–1–naphthylamine in 5N
3. Acetic acid Laarly sulfate in tris hydrochloride
4. Fast blue BB in 2–methoxy ethanol 40 % Pottasium hydrochloride
5. 60 % α-naphthol in ethanol

The results were interpreted 10 minutes after adding the reagents, then the results were transformed to numbers, the tape was divided into 7 groups, each group included three numbered tests (1, 2, and 4), and each positive examination was given its number according to its sequence in the tape. As for the negative check, give him the number zero, then take the sum of the three numbers for each group, and seven numbers were obtained that can be balanced with the numbers in the index number provided by the company (BioMerieux). Thus, bacterial isolates were diagnosed (Brun *et al.*, 1978; Shamran *et al.*, 2018).

RESULTS AND DISCUSSION

Isolation

100 urine samples were transplanted to the solid salt mannitol medium for patients with urinary tract infection, and this medium was used as a selective medium for the sex of staphylococcus due to the fact that it contains 7.5% of NaCl salt, as the staphylococcus resists this concentration of table salt, and is also a medium Africa contains mannitol sugar that distinguishes the species of staphylococcus, and the colonies grown on the medium of solid brine mannitol fermented to mannitol and non-fermented sugar (Chillab *et al.*, 2019) were taken. To make sure of its purity, it was planted on the center of the nourishing agar, and the growing colonies appeared on it smooth, slightly raised from the surface of the cultivated medium and with a dark white color, and the yellow color when growing for a longer period. 35 Isolation under the microscope is positive for gram, spherical in shape, grouped in clusters, or grouped as single, double, or quadruple (Al-Grawi and Al-Awsi, 2018).

Diagnosis

The pathological isolates of 35 isolates were diagnosed with an isolation rate of 35% of the total 100 abnormalities. The colonies under study are fed into water and oxygen by the enzyme catalase. This test is necessary to distinguish the sex of streptococci from the genus Streptococci, and the gender of streptococci of the genus Micrococcus was distinguished as the staphylococcus was anaerobic fermentation of glucose anaerobically, and it was resistant to Bacitracin (0.04 units) as inferred With an inhibition diameter of less than 9 mm, this is because staphylococcus contains Teichoic acid in its cell wall with peptides in the bridges between the peptides of the cell wall that give it the resistance to pistracene (Abed and Salim, 2018) and all isolates were negative for the oxidase test After being diagnosed with isolation A bacterial at the sex level was diagnosed at the gender level, where it was tested Coagulase production, 20 isolates were given, which gave a negative result for the test of Cocaulase (of which 15 isolated from women with urinary tract infection, and 5 isolated isolates from men with urinary tract infection) From a total of 50 isolates of staphylococci, the percentage of CoNS was 50% of the total of the excretory samples and 57.1% of the total isolated staphylococcus, thus distinguished from S. aureus and other types positive for the test of cocaine, and then an anti-resistance test was performed. The life is Novop Leucine (Novobiocin 5μg) and the diameter of the inhibition of less than 18 millimeters, as it is important for the diagnosis group Staphylococcus aureus negative Kwakaoleezzhat divided into two groups (Paulis *et al.*, 2003)

The first group that is resistant to this antagonist includes S. xylosus, S. cohnii, S. lentus, S. saprophyticus, and S.sciuri.

The second group sensitive to Novopiocin antagonist includes S. epidermidis, S.auricularis, S. hominis, S. haemolyticus and S. capitis.

Also, all S. xylosus isolates managed to grow at temperatures (45-15 C), as well as all isolates managed to grow with high salt concentrations (1, 13%), and the results showed that the isolates varied in their production of the urease enzyme, so it was 3 isolates producing this enzyme. The hemolytic enzyme (Haemolysin), not all isolates were able to produce DNA breakdown enzyme (DNase), and S. xylosus isolates yielded positive results as the following sugars were enriched (xylose, sucrose, arabinose, maltose, and mannose).

The diagnosis of S. xylosus isolates has also been confirmed using the API Staph system.

By comparing the isolation ratios of S. xylosus with global studies conducted on CoNS, where 145 isolated isolates from hydrothermal samples were tested for patients with urinary tract infection and identified by performing biochemical tests as well as using the API Staph system, as well as its sensitivity to life, it has proven a yield of 5 isolates (3.2 %) Belonging to S. xylosus, 3 (2.1%) S. simulans, 4 (2.8%) S. hominins, 7 (4.7%) S. haemolyticus, 24 (17%) S. saprophyticus, 102 isolates (70%) subspecies S. epidermidis (Abed and Salim, 2019).

S. xylosus was isolated by 6% isolated from a total of 300 diuresis samples for patients with urinary tract infection (Ewaid *et al.*, 2020; Abed and Salim, 2019).

We note that there is a difference "in the ratios of isolation of S. xylosus bacteria between the local and international study. This difference may be attributed to the geography of the country, gender, and the use of life antibiotics, and the different factors of virulence of S. xylosus bacteria according to the different determining factors of settlement (Ewaid and Al-Ansari, 019a; Ewaid *et al.*, 019b; Ewaid and Abed, 2017). Because global studies did not focus on S. xylosus, a "major" cause of urinary tract infection, especially in young women because these bacteria are affiliated with CoNS, it was observed that these multiple bacteria were resistant to antibiotics, and were isolated from patients with urinary tract infection and from the duct Female reproductive urology (Abed *et al.*, 2019; Al-Zaidy *et al.*, 2019) D is isolated locally from patients with urinary tract infection (Abed, 2017). Therefore, it is necessary not to neglect this type of bacteria to study it more deeply in order to learn more about its disease and study its physiological and pathogenic properties (Al-Hamzawi *et al.*, 2018).

CONCLUSION

The yield of 20 isolates to the negative staphylococcus aureus was tested for cocaine, and 5 isolates were of type S. xylosus, with an isolation rate of 25% of the total negative staphylococci for testing cocaine, and by 5% of the total of the reagent samples. These biochemical bacteria were diagnosed using the API Staph system.

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