Antibacterial activities of black tea alcohol ethanolic extract and some antibiotics against isolates *Staphylococcus aureus* and *Staphylococcus epidermidis* isolated from conjunctivitis.

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**ABSTRACT**

Isolation of bacterial from eye infections (conjunctivitis) was carried out in this study. 39 specimens (55.71%) gave positive bacterial culture from totally 70 samples. We found that *staphylococcus aureus* and *staphylococcus epidermidis* in 35.71 and 20% respectively from the total isolates.

Antibacterial activities of the antibiotics vancomycin, oxacillin, cephalothin chloramphenicol, tobramycin, ciprofloxacin *Staph. Aureus* and *Staph. Epidermidis* shows resistance rate about (4, 12, 16, 28, 8, 8%) and (7, 14, 14.28, 35.7, 28.57, 42.85, 21.42%) respectively.

The inhibition ability of black tea alcoholic extract against *Staph. aureus* and *Staph. epidermidis* isolates at concentration (10, 20, 40, 80, 100%) were (13, 15, 17, 19, 27) mm, (10, 14, 16, 18, 24) mm of inhibition zones respectively.

**Keywords:** antibacterial activity, antibiotic, black tea, conjunctivitis.

**INTRODUCTION**

The conjunctiva is a mucous membrane which covers the under surface of the lids and is reflected from the lids to cover part of the eye ball up to the margin of the cornea (Jain, 1990).
Most conjunctival disorders are self-limiting and seldom affect vision, but some lead to blindness, if left untreated, conjunctivitis is characterized by hyperemia fomites or the patient's own hands and spread from one eye to the others (Smith, 1997).

Conjunctivitis can be produced by viral or bacterial infection (Tetz et al., 1997) in bacterial conjunctivitis discharge various from mild to severe but usually appears purulent and persists throughout the day (Tarabishy et al., 2008). The choice of an antimicrobial is not only influenced by the type and susceptibility of the infecting organism but also by the mode of action when more than one antibiotic is used a part from the spectrum of the individual antibiotic, synergism and antagonism must be kept in mind (Smith, 1997).

The purpose of this study is to determine the invitro effect of black tea alcohol ethanolic extract and some antibiotics on Staph. aureus and Staph. epidermidis isolate from conjunctivitis.

MATERIALS AND METHODS

Patients

This work was done at Baquba general hospital (70) specimens were collected from patient with conjunctivitis by sterile swabs.

Isolation and identification

The clinical samples were added to the brain heart infusion broth then incubated at 37°C for 18 to 24h. and then cultured on 5% sheep blood agar and mac Conkey agar.

Identification of Staph. aureus and Staph. epidermidis were depend on routine laboratory techniques (Forbes et al., 2007)

Plant extracts

Black tea (Camellia Sinensis "Theaceae") leaves were obtained from the markets various aqueous of ethanol alcoholic concentrations (10, 20, 40, 80, 100) mg/ml of leaves extracts were prepared according to Deshmukl and Borle, (1975) and sterilized by millipore filter technique (diameter 25Mm, pore size 0.45Mm).
Antibiotics

Six antibiotics (as antibiotic disc) were used for comparison their effects. Vancomycin (10 mcg), Oxacillin Ox (1mcg), Cephalothin Cp (5mcg), Chlormphenical C (30mcg), Tobramycin (10mg), Coprofloxacin (5mg). Antibiotic discs were supplied from Bioanalyse (Turkey).

Evaluation the antibacterial activity

agar diffusion method was used to evaluated antibacterial activity of plant extracts and antibiotics on growth of bacterial types isolated from conjunctivitis patients to determine growth inhibition zones (Mm) by using Muller-Hinton agar.

RESULTS AND DISCUSSION

Thirty nine isolates were identified as shown in table(1).72.21% of Gram positive were detected Staph. aureus in 46.29% from the positive cases followed by Staph.edidermidis in 25.29%. In spite of the fact that the source of infection cannot be determined up to 20% of the bacteria present in this flora might be associated with biofilm formation and, once adhered by electrostatic attraction to the intraocular lense will cause infection (Miyanage,1997). Other studies supported reslts of our study that the Staph. aureus and Staph .epidermidis associate with conjunctivitis (Hughes and Hill(1994), Tetz et al., (1997); Locatelli et al., (2008); AL-Sammary,(2007).

Staph. aureus are able to cause severe infection because they can produces a large numbers of toxins and enzmes such as leucocidin, coagulase, Hyaluronidase and Syndrome toxin (Forbes et al., 2007 ).
Table 1. The rate of Staph. aureus and Staph. epidermidis isolated from 54 positive cultured cases patients with conjunctivitis.

<table>
<thead>
<tr>
<th>Bacterial types</th>
<th>N of cases</th>
<th>% from the +ve cases (54)</th>
<th>% from total isolates (70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staph. aureus</td>
<td>25</td>
<td>46.29</td>
<td>35.71</td>
</tr>
<tr>
<td>Staph. epidermidis</td>
<td>14</td>
<td>25.92</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>72.21</td>
<td>55.71</td>
</tr>
</tbody>
</table>

Table(2) shows that *Staph. Aureus* and *Staph. epidermidis* have a low rate resistance to vancomycin while antibiotics high resistance developed by *Staph. aureus* and *staph. epidermidis* to Cephathin and tobramyin respectively Iwalokun et al., (2007 observed that *staph. areus* and *staph. epidermidis* have high resistance to streptomycin ,ampicillin and amoxicillin .

Locatelli et al.,(2003 observed that vacomycin displayed the best activity followed by cephaothin, ofloxacin and oxacillin .

Petersdorf et al.,(1960 stressed a significant ability of Staphylococci to developresistance against chloramphenicol .

It has recently been show that *Staph.aureus* and *Staph.epiderminis* are capable of biofilm formation an important factor for adherence antibiotic resistance and protection from host innate defense (Costerton et al.,1999)

Resistance of *Staph.epidermidis* biofilm to some antibiotics of *Staph* to some antibiotics might in part , be due to a poor antibiotic penetration nutrient limitation and slow growth, adaptive stress responses and formation persisted cell in a biofilm, *Staph.epidermidis* is prones and formation persisted cell in a biofilm, *Staph. epidermidis* is protected against attacks from the immune system and antibiotic treatment making *Staph .epidermidis* infections difficult to eradicate (Laikwok et al., 2003).
Table 2. Resistance of Staph. aureus and Staph. epidermidis to some antibiotics

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>The rate of from Staph. aureus</th>
<th>Resistance (%) Staph. epidermidis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>4%</td>
<td>7.14%</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>12%</td>
<td>14.28%</td>
</tr>
<tr>
<td>Cephalothin</td>
<td>16%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Choramphenicol</td>
<td>28%</td>
<td>28.57%</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>8%</td>
<td>42.85%</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>8%</td>
<td>21.42%</td>
</tr>
</tbody>
</table>

Figure (1) shows the zones of inhabitation of black tea alcohol ethanolic extract wider range from (13-27) mm in Staph. aureus and (10-24) mm in Staph. epidermidis.

Michalczyk and Zawislak, (2008) reported that black and green tea may exert a modeling effect on the balance of the intestinal microflora and Staphylococcus aureus was the most sensitive to the addition of tea extracts to the media. (Yam et al., 2007).

Ciraj et al., (2001) studied the antibacterial activity of the alcoholic extract of black tea against salmonella serotypes causing enteric fever and found that 42.19% of S. typhi was inhibited by this extract, Staph. aureus and Vibrio parahaemolyticus which causes diarrhoeal diseases inhibited by tea and coffee extracts (Toda et al., 2008). Tea leaves produce organic compounds that may be involved in the defense of the plants against invading pathogens, these metabolites compound include polyphenolic, catechin, methyl-xanthine, theobromine (Friedman, 2007).

Ikigar et al., (10) indicated that catechin damages the lipid bilayer which partly explains the greater bactericidal effect of catechin to Gram positive bacteria than Gram negative bacteria, polyphenol are contain in green tea at an approximate concentration of 10-15% and 5% in black tea. Tea leaves usually contain to 8% of epigallocatechin gallate (EGCg), which is the dominant constituent of polyphenon 705 and is recognized to play a major role in anti-microbial effects. Khalaf et al., (1993) found that the antioxidant activity of black tea due to ascorbic acid and phenolic content.

Laikwok et al., (2001) believe that the flavins in black tea posses at least the same antioxidant potential as catechins present in green tea the glycosides, tannis and flavonoids in the crude methanolic extract tea leaves are known to posses potent antioxidant activity (Lee et al., 2004).
Figure 1. The antibacterial activity of black tea alcohol ethanolic extract on Staph and Staph. epidermidis.

REFERENCES


Newyork.


الفعالية ضد الميكروبية لمستخلص الإيثانول الكحولي للشاي الأسود وبعض المضادات الحياتية ضد العزلات من التهاب

Staphylococcus aureus & Staphyloccus epidermidies

الأخوان

نسام عادل يفتّاح
قسم العلوم / كلية التربية الأساسية
جامعة ديالى

الخلاصة

أظهرت نتائج الزرع البكتريولوجي لـ (70) عينة جمعت من حالات التهاب الأفام التلوث ببكتريا Staph.epidermidies و Staph .aureus Staph.epidermidies و Staph .aureus للعزلات. أوضحت دراسة حساسية العزلتين للمضادات الحياتية Chloramphenicol Oxacillin , Cephalothin , Vancomycin إن معدلات المقاومة كانت (8,28, 8,8,8,28,28,14,7,14,12,4, 42,5,7,16,16,16,16,16) % على التوالي.

كما واظهر استخدام مستخلص الإيثانول الكحولي للشاي الأسود بتراكيز (10,20,40,80,100)% تأثيراً وبمعدل (13,19,17,15,13) ملم و (10,27,19,17,15,13) ملم لكل ملم و (10,24,18,16,14,10) ملم على التوالي. Staph.epidermidies