A Survey of Antibiotic Resistant *Staphylococcus Aureus* Strains from Clinical Sources in Owerri

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**ABSTRACT:** A survey of antibiotic resistant *Staphylococcus aureus* strains from clinical specimens was carried out. A total of 100 different clinical specimens were investigated with a yield of 48 *Staphylococcus aureus* isolates. A high resistance of 95.8% to penicillin, 89.6% to ampicillin, 87.5% to tetracycline, and 75.0% to chloramphenicol by *Staphylococcus aureus* strains were recorded. A high susceptibility of 91.7% to gentamicin and 85.4% to cloxacillin were also recorded. The high percentage resistance to the antibiotics studied could be attributed to their prevailing usage and abuse in the area under study. The implication of the high percentage recorded for the antibiotics is that *Staphylococcus aureus* infections could be effectively treated with gentamicin and cloxacillin and not with penicillin, ampicillin, tetracycline, and chloramphenicol in the area under study.

**MATERIALS AND METHODS**

Forty-eight strains of *Staphylococcus aureus* were isolated from clinical sources. The specimens were obtained from different patients under medical attention in specialist and private hospitals in Owerri, Imo State, Nigeria. The specimens obtained were wound swabs, nasal swabs, high vaginal swabs and urine samples. The specimens were collected as described by Cheesbrough (1984).

The samples were streaked on mannitol salt agar (MSA) and blood agar (BA) plates. The plates were all incubated at 37°C for 24 hours, after which the cultural and morphological characteristics of the isolates were studied. Identification of isolates was by standard microbiological methods as described by Cheesbrough (1984) and Cowan (1993). The samples were collected as described by Cheesbrough (1984).

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used contained the following antibiotics: Ampicillin (10mcg), Chloramphenicol (30mcg), Cloxacillin (mcg), erythromycin (10 mcg), gentamicin (10mcg), penicillin (10U), tetracycline (30mcg), streptomycin (10mcg).

**RESULTS AND DISCUSSION**

100 clinical specimens were investigated for the presence of *Staphylococcus aureus* (Table 1). The frequency of isolation of *Staphylococcus aureus* from the different specimens analyzed is given in table 1; a total of 48 isolates of *Staphylococcus aureus* were isolated. The isolates were most sensitive to gentamicin (91.7%), cloxacillin (85.4%) and most resistant to penicillin (95.8%) and ampicillin (89.6%), (Table 2). The capacity of *Staphylococcus aureus* to produce human diseases has not diminished with the introduction of antibiotics (Waldvogel, 1990). The organisms exhibit remarkable versatility in their behaviour towards antibiotics (Grassi, 1988), with some strains having overcome most commonly used drugs. In this study, a high sensitivity percentage to gentamicin (91.7%), Cloxacillin (85.4%) was recorded. Also most of the strains of *Staphylococcus aureus* were sensitive to erythromycin (66.7%) and streptomycin (66.7%). This finding shows that staphylococcal infections could be treated with gentamicin, cloxacillin, erythromycin and streptomycin and corroborates that of Oyagade and Oguntoyinbo (1997) and Uba and Umar (2002). A percentage sensitivity of 4.2%, 10.4%, 12.5% and 25% were recorded against penicillin, ampicillin, tetracycline and chloramphenicol respectively in this study. Oyagade and Oguntoyinbo (1997) found a 2%, 22%, 32% and 58% sensitivity to penicillin, ampicillin, tetracycline and chloramphenicol respectively which were also relatively low (although higher than our findings). Iroegbu, et al, (1997) in their study showed a sensitivity of 43.3%, 58.6%. 41.4% and 30.9% to penicillin, ampicillin, tetracycline and chloramphenicol respectively by their *Staphylococcus aureus* strains. The variation found in the sensitivity pattern to these commonly used drugs could be attributed to the prevailing usage and abuse of the drugs in the areas under study. The high rate of resistance to these commonly used drugs contrast with the high sensitivity to gentamicin and cloxacillin, which are less frequently used. This further suggests a relationship between antibiotic usage and the level of drug resistance encountered in this study. The judicious use of antibiotics by health workers and efforts to control procurement and use of antibiotics officially in the locality will probably help to limit the increasing rate of drug resistance in pathogens. It is the recommendation of this study that constant evaluation of the antibiotic sensitivity pattern of pathogens for commonly used antimicrobial agents in a particular environment be carried out.

Table 1. Frequency of *Staphylococcus aureus* from different clinical specimens

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Number examined</th>
<th>Number isolated (% occurrence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound</td>
<td>16</td>
<td>5 (10.4)</td>
</tr>
<tr>
<td>Nasal</td>
<td>29</td>
<td>16 (33.3)</td>
</tr>
<tr>
<td>High vaginal</td>
<td>44</td>
<td>20 (41.7)</td>
</tr>
<tr>
<td>Urine</td>
<td>11</td>
<td>7 (14.6)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 2: Sensitivity pattern of *Staphylococcus aureus* from clinical specimens

<table>
<thead>
<tr>
<th>Isolates</th>
<th>No. of isolates</th>
<th>PN</th>
<th>CHI</th>
<th>CLX</th>
<th>E</th>
<th>GM</th>
<th>PEN</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staph. aureus</em></td>
<td>48</td>
<td>5(10.4)</td>
<td>12(25)</td>
<td>41(85.4)</td>
<td>32(66.7)</td>
<td>44(91.7)</td>
<td>2(4.2)</td>
<td>6(12.5)</td>
</tr>
</tbody>
</table>

Key: Ampicillin = PN, Chloramphenicol = CHL, Cloxacillin = CLX, Erythromycin = E, Gentamicin = GM, Penicillin = PEN, Tetracycline = TE, Streptomycin = S.
REFERENCE


