Inappropriate use of antibiotics may play a major role in the development and spread of antibiotic resistant bacteria. Against this background, questionnaires were administered for utilization of antibiotic usage among some Nigerians in Benin. There were 3435 respondents made up of 743 (21.6%) housewives, 467 (13.6%) taxi drivers, 892 (26.0%) students, 288 (8.4%) teachers, 85 (2.5%) lawyers, 741 (21.5%) traders and 219 (6.4%) others. The questionnaires revealed that 43.1% and 56.9% of the populace took full and incomplete regimens, respectively. The commonly prescribed antibiotics were ampicillin, chloramphenicol, streptomycin, and tetracycline. The least prescribed were cefotaxime, pefloxacin and ciprofloxacin while methicillin and vancomycin were not prescribed at all. There was no significant difference (p>0.05) between the mean prevalently used antibiotics. It was also found that lawyers, teachers, students took antibiotics without prescription even for unspecified ailments, which contradicts the WHO guidelines on the usage of antibiotics.

Key words: Antibiotics usage, Nigerian populace.

INTRODUCTION

Antibiotics are drugs prescribed to treat bacterial infections and the call for prudent use of these antibiotics across the globe has been a general failure and threat to public health (HLSCST, 1998). The paradigms appear to be the recent, rapid emergence of several multi-drug-resistant bacteria that were under check during the 1940s (Fleming, 1945). Also the high prevalence of antimicrobial resistant pathogens in health care is part of the problem which has complicated patient management and increased patient morbidity and mortality. The drivers for such resistant organisms include the inappropriate use/misuse of drugs in our communities (Okeke et al., 1999; Guerin et al., 2000).

The need to measure the effectiveness and efficiency of drug to improve the data for antibiotic resistant organisms is very important. In this paper we report through the use of questionnaires how people tend to use antibiotics in Benin City in relation to why these drugs are taken, the prescribing source and the purpose.

METHODS

The survey was performed through the use of questionnaires and records. The details of the frequently prescribed and most utilized antibiotics were obtained from clinics and hospital’s records in Benin City Nigeria. A total of 5000 questionnaires were administered systematically to housewives, Taxi drivers, teachers, traders, lawyers, students and others to evaluate the level of antibiotics utilization by some Nigerians in the City of Benin, Nigeria over a period of 3 years. The antibiotics considered were pefloxacin (Pef), ciprofloxacin (Cip), norfloxacin (Nor), nalidixic acid (Na), penicillin (Pen), ampicillin (Am), cloxacillin (Clo), methicillin (Met), vancomycin (Van), cefotaxime (Cef), gentamicin (Gn), chloramphenicol (Chl), tetracycline (Te), streptomycin (Sxt), erythromycin (E) and cotrimoxazole (Cot). The profession (trader, housewife, taxi driver, student, teacher, lawyer, others) of the respondents was also considered. Other data obtained include the mode by which the antibiotics were taken, source of prescriber and the purpose for which they were taken (Table 1). The following diseases were
Table 1. Prevalence % of antibiotics usage by occupation.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number that takes antibiotics</th>
<th>Prescriber</th>
<th>Regimen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Rarely</td>
<td>Frequently</td>
</tr>
<tr>
<td>House wife</td>
<td>743</td>
<td>85</td>
<td>15</td>
</tr>
<tr>
<td>Taxi Drivers</td>
<td>467</td>
<td>67.5</td>
<td>32.5</td>
</tr>
<tr>
<td>Students</td>
<td>892</td>
<td>96</td>
<td>4</td>
</tr>
<tr>
<td>Teachers</td>
<td>288</td>
<td>98.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Lawyers</td>
<td>85</td>
<td>96.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Traders</td>
<td>741</td>
<td>85.6</td>
<td>14.4</td>
</tr>
<tr>
<td>Others</td>
<td>219</td>
<td>94.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Total</td>
<td>3435</td>
<td>87.6</td>
<td>12.4</td>
</tr>
</tbody>
</table>

Taken into consideration; diarrhea, sore throat, typhoid, dysentery, malaria, body pain and others.

Statistic analysis
The Chi-square test and the student two-tailed t test were used for the analysis. A difference of significant was considered when P-value was less than 0.05 (P<0.05) using the Instat Computer package.

RESULTS AND DISCUSSION
The results show that 3435 respondents made up of 743 (21.6%) housewives, 467(13.6%) Taxi drivers, 892 (26.0%) students, 288(8.4%) teachers, 85 (2.5%) lawyers, 741(21.5%) traders and 219 (6.4%) others responded to the questionnaires. The results which served for the evaluation of antibiotics usage, showed that 1855 (54.0%) of the respondents preferred the patronage of drug retailers, followed by self prescribers 537 (15.6%), friends and relatives 201 (5.9%) rather than the services of qualified health personnel such as doctors and pharmacists. This result however, vary from those earlier reported by Consuelo and Milton (1998) in Mexico where they found that doctors recommended 60% of medicinal drugs and were followed by self-medication (19.4%), neighbours and relatives (30.7%), pharmacist (4.9%), nurses (3.9%) and others (1.4%). Misuse of antibiotics by physicians, patients and health personnel in clinical practice in developing countries however, can also provide selective pressure favoring resistant bacterial strains. Inappropriate use of antibiotics increases the risk for selection and dissemination of antibiotic-resistant bacteria, which are often placed at a competitive advantage (Okeke et al., 1999; Levy, 2001). Other results earlier reported by Levy (2001) showed that antibiotic abuse and selection for resistant bacteria was due to poor patient compliance. Although in Mexico, poor patient-physician communication was partially responsible for the non-compliance compliance of patients with antibiotic regimens (Consuelo and Milton, 1998).

The results also showed that ampicillin, erythromycin, gentamicin, penicillin, tetracycline, were the most commonly prescribed antibiotics while the pefloxacin, and ciprofloxacin and cefotaxime were the least prescribed. The methicillin and vancomycin were not prescribed at all as shown in Figure 1. There was no significant different (p>0.05) between the mean prevalently used antibiotics. Developing countries however have a great need for drug utilization research as a tool for monitoring the effectiveness and efficiency of drugs. Besides, the inappropriate use of antibiotics may also play a major role in the development and spread of antibiotic resistant bacteria. Against this background, questionnaires served on participants in this survey revealed that over 50% preferred the patronage of drug retailers rather than the services of qualified health personnel such as doctors and pharmacists. This result however, vary from those earlier reported by Consuelo and Milton (1998) in Mexico where they found that doctors recommended 60% of medicinal drugs and were followed by self-medication (19.4%), neighbours and relatives (30.7%), pharmacist (4.9%), nurses (3.9%) and others (1.4%). Misuse of antibiotics by physicians, patients and health personnel in clinical practice in developing countries however, can also provide selective pressure favoring resistant bacterial strains. Inappropriate use of antibiotics increases the risk for selection and dissemination of antibiotic-resistant bacteria, which are often placed at a competitive advantage (Okeke et al., 1999; Levy, 2001). Other results earlier reported by Levy (2001) showed that antibiotic abuse and selection for resistant bacteria was due to poor patient compliance. Although in Mexico, poor patient-physician communication was partially responsible for the non-compliance compliance of patients with antibiotic regimens (Consuelo and Milton, 1998).
Figure 1. Prevalence % of anti biotic use. Pefloxacin (Pef), ciprofloxacin (Cip), norfloxacin (Nor), nalidixic acid (Na), penicillin (Pen), ampicillin (Am), cloxacillin (Clo), methicillin (Met), vancomycin (Van), cefotaxime (Cef), gentamicin (Gn), chloramphenicol (Chi), tetracycline (Te), streptomycin (Sxt), erythromycin (E) and coltrimoxazole (Cot).

Table 2. Prevalence (%) by occupation to some common diseases treated without proper antibiotics prescription.

<table>
<thead>
<tr>
<th>Occupation of respondent</th>
<th>No. of respondents</th>
<th>Malaria</th>
<th>Typhoid fever</th>
<th>Urine</th>
<th>Sore throat</th>
<th>Body pain</th>
<th>No reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>House wife</td>
<td>673</td>
<td>5.1</td>
<td>32</td>
<td>21.7</td>
<td>4.8</td>
<td>27.6</td>
<td>3.3</td>
</tr>
<tr>
<td>Taxi Drivers</td>
<td>315</td>
<td>27</td>
<td>39</td>
<td>43.8</td>
<td>10.8</td>
<td>29.8</td>
<td>4.8</td>
</tr>
<tr>
<td>Students</td>
<td>596</td>
<td>-</td>
<td>21.1</td>
<td>7.9</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Teachers</td>
<td>208</td>
<td>-</td>
<td>16.8</td>
<td>22.1</td>
<td>22.1</td>
<td>22.1</td>
<td>-</td>
</tr>
<tr>
<td>Lawyers</td>
<td>85</td>
<td>-</td>
<td>31.8</td>
<td>25.9</td>
<td>2.3</td>
<td>2.4</td>
<td>-</td>
</tr>
<tr>
<td>Traders</td>
<td>432</td>
<td>-</td>
<td>29.4</td>
<td>54.2</td>
<td>3.9</td>
<td>23.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Others</td>
<td>172</td>
<td>2.3</td>
<td>25.6</td>
<td>31.4</td>
<td>4.1</td>
<td>23.3</td>
<td>5.2</td>
</tr>
</tbody>
</table>

1993; Okeke and Lamikanra, 1985; Yah et al., 2006). Other reports by Lansang et al. (1990) had shown that incomplete regimens compliance in developing countries at times among patients often depends on long distances travelled and large expenses incurred for medical care; they are unlikely to return for follow-up visits. In addition, the patient may be unable to read antibiotic labels. (Esezobo, 1986 and Ali et al., 1988) Also, some of the drugs are usually expensive and patients may purchase incomplete regimens whenever possible and discontinue treatment when the symptoms and signs disappear therefore treating the symptoms of the disease rather than the pathogen (Lansang et al., 1990, and Agom et al 1990).

The prevalence of common diseases treated without proper antibiotics prescription by health officials varied among the occupation. It was found that lawyers, teachers, students take antibiotics without prescription even for unspecified ailments such as body pain. This therefore contradicts the World Health Organization guidelines for the use of antibiotics, which states that there must be the establishment of cause of a disease before antibiotics prescription can be made. This phenomenon in developing countries can often be traced to complex socioeconomic and behavioral factors, which contribute to the escalating problem of antibiotic resistance worldwide.
The results also showed that ampicillin, gentamicin, tetracycline, penicillin erythromycin, chloramphenicol were the most commonly prescribed antibiotics while pefloxacin, ciprofloxacin and cefotaxime were the least prescribed. The methicillin and vancomycin were not prescribed at all (Figure 1). There was also no significant different (p>0.05) between the mean prevalently used antibiotics. The antibiotics used in this study showed that ampicillin, chloramphenicol, penicillin, erythromycin tetracycline, nalidixic acid, norfloxacin are older, common, cheaper and available than the more expensive, scarce, potent and generic antibiotics; pefloxacin, ciprofloxacin, cefotaxime, methicillin and vancomycin. Therefore, one would expect that drugs more commonly affected by bacterial resistance in developing countries are generally inexpensive and popular broad-spectrum agents (Calva et al., 1996). However, the relationship between antibiotic use and the emergence and spread of resistance is a complex one. Resistance of pathogens to these available, cheap, older and commonly abused drugs would definitely result in high cost of treatment, longer hospital stay and therapeutic failure, which might lead to life-threatening diseases and more deaths (Lau et al., 2004).

We observed a significant association between the prescriber and the occupation of subjects (p<0.05) in the City of Benin. Most subjects in the study preferred the patronage of drug retailers than authorized agents such as doctors and pharmacist. Hossain et al. (1982) reported that in rural Bangladesh, for example, 95% of drugs consumed for one month by more than 2,000 study participants came from local pharmacies while physicians prescribed only 5%. These people are encouraged to buy from unofficial distributors because drugs often are not available in government hospitals (Goel et al., 1996). According to reports of Kafle et al. (1992), in Nepal, retail drug outlets are four times as numerous as government health posts and hospitals. Alternate sources offer the option of purchasing small quantities antibiotic regimens (Bojalil et al., 1994; Dua et al., 1994; of medicines, while Lansang et al., 1990). At times drug vendors who have little or no knowledge of the required dosage regimens, indications, or contraindications are prescribers (Dua et al., 1984; Goel et al., 1996). Also in markets and public transport cars in West African countries and Nigeria (Okeke and Lamikanra, 1985), the vendor usually tries to convince potential buyers to purchase the drug. These sub-inhibitory antibiotic regimens predispose for selection of resistant bacterial strains (Levy, 2001). Also in many developing countries, well-trained health personnel are scarce and cannot serve the entire population, especially in rural areas. Therefore, unskilled personnel are less aware of the deleterious effects of inappropriate use of antibiotics. In Thailand for example, pharmacy technicians prescribed rifampicin for urethritis and tetracycline for young children (Thamlikitkul, 1988). Also in developing countries, antibiotics can be purchased without prescription, even when the practice is not legal.

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