

PATTERNS OF ANTIBIOTIC DRUG USE IN SOUTHERN NIGERIA COMMUNITIES.



ISSN: 2141 – 3290
www.wojast.com

ARIKPO G.E., EJA M.E, ENYI-IDOH* K.H., AKUBUENYI F.,
NGANG U, AKAM C. AND EKOMABASI I.

*Department of Biological Sciences
Cross River University of Technology, Calabar. Nigeria
Corresponding author: Email:kingenyi4gold@yahoo.com*

ABSTRACT: The emergence of antibiotic resistance is a major problem worldwide and one that is of great concern as this group of drugs save many lives and sometime are the only cures for many ailments. It is well known that misuse of antibiotics such as using where inappropriate or in the wrong dosage leads to antibiotic resistance amongst organisms. This study examined the patterns of antibiotic use in parts of Southern Nigeria. A structured questionnaire on antibiotic use was distributed amongst 1325 individuals within Southern Nigeria. The study showed that only 45% of respondents bothered to see a medical practitioner to get a prescription for antibiotics. Those that did see a doctor were likely to be the more educated or in Government Jobs. The majority of respondents (84%) did not complete their treatment and 70% admitted keeping unused antibiotics for use when next they are unwell. On the use of antibiotics, 40% of respondents either did not know what antibiotics were for or mentioned inappropriate uses such as malaria. The most used group of antibiotics used were the Penicillins, with Ampiclox accounting for 20% while the Quinolones made up 10% of antibiotics used. It is suggested that the trends show the likelihood of antibiotic resistance emerging in many classes of antibiotics and it is suggested that a campaign to educate the public needs to be undertaken.

INTRODUCTION

Antibiotic resistance is a major public health threat worldwide. There is plenty of evidence to show that the emergence of resistance is linked to the use of antibiotics.(Albrich *et al.*, 2004 and Howe, 2008). It is well known that much antibiotic use is probably inappropriate (Wise *et al.* 1998). Although the scientific evidence may be complex it is generally accepted that more antibiotic use is associated with greater bacterial resistance as shown by surveys of antibiotic use and resistance across Europe, (Reeves *et al.*, 1999, Kahlmeter and Cars, 2001, Goossens *et al.*, 2005). Rates of antibiotic consumption correlate closely with rates of antimicrobial resistance, including both the hospital environment and outpatient settings (Austin *et al.*, 1999 and Goossens *et al.*, 2005).

In the area of study (Southern Nigeria), the health service, as is true of most of Nigeria, consists of an uneven distribution and inadequate number of health facilities especially in primary health care.(CR-SEEDS, 2005). Many of the health institutions lack adequate personnel and facilities to provide quality care for the public. Most facilities lack basic provisions such as ambulances, utility vehicles, water, electricity, drugs and equipment. There is a high level of disease burden due to preventable causes, rising prevalence of non-communicable diseases (NCD's) with insufficient resource allocation to the health sector.

In Nigeria antibiotics like most medication are available over the counter (OTC) without a prescription. Self medication, that is the use of any medicine for the treatment of oneself without a physician's prescription, is a common practice. Such ailments may be fever, body pains, indigestion, diarrhoea, etc. In any case, several people, friends, relatives and even patent medicine sellers (PMS) may advise the sick person on the type of medicine to take as a cure (Ross-Degnan *et al.*, 1996). The two main sources of self-medication include the use of left-

over antibiotics from previous courses of treatment and the acquisition from pharmacies without prescription (Grigoryan, *et al.*, 2006). In Nigeria, Patent Medicine Sellers (PMS) are usually the first choice in health care and a recognized primary source of orthodox drugs for both rural and urban populations, especially the poor (Iweze, 1987 and Salako *et al.*, 2001). Coupled with this, is the issue of fake and adulterated/counterfeit drugs, a fight which the National Agency for Food and Drug Administration and Control (NAFDAC), established by Decree 15 of 1993 as amended by Decree 19 of 1999 and now Act Cap N1 Laws of the Federation of Nigeria (LFN) 2004, to regulate and control the manufacture, importation, exportation, distribution, advertisement, sale and use of food, drugs, cosmetics, chemicals, medical devices and packaged water (known as regulated products), is seriously taking on.

The aim of this study was to estimate and compare the prevalence of actual self-medication and at-risk for self-medication with antimicrobial drugs in participating communities in the South of Nigeria. The demographic characteristics associated with such use, the sources of self-medication, the symptoms for which the drugs were reportedly used, and duration of use was also examined.

MATERIALS AND METHOD

The Study Design

The study was carried out in seven Local Government Areas, six in Cross River and one in Akwa Ibom States of Nigeria. These were Akamkpa, Biase, Calabar South, Eket, Udukpani, Ogoja and Yakurr. The communities consisted of urban/semiurban areas and were the headquarters of the local government area. The communities had some basic health facilities such as a hospital, some privately run single doctor clinics, and in some case a health care centre. One or two medicine stores and medicine hawkers were seen in some of the communities except for Calabar where a few private pharmacies were available. A few of the operators of the medicine stores displayed their patent medicine licenses on the walls of the stores. Almost all the patent medicine sellers (PMS) appeared to have had little education and none had any professional training in the medical field. The health care centres in the communities were government-owned with relatively cheap but usually mismanaged services, while others were privately owned with expensive and inadequate services. The main employers were the Local Government and State civil service.

Sampling Design and Method of Data Collection

Structured questionnaires were used for this study. For the purposes of reliability, confidence and co-operation by the members and heads of communities, official letters from the Cross River University of Technology were given to the community heads, introducing the research team before data were collected. A total of 1325 questionnaires were distributed to people aged 18 years and above who had used antibiotics in the last 12 months. The questionnaires contained questions that would enable the research team evaluate the antibiotic medication habit of the people in relation to, consulting a physician or resorting to other means of treatment in times of sickness, their perception of what they understood antibiotics were for and whether they completed their course of antibiotics, what they did with left over medication and type of antibiotics used.

Data Analyses

The data obtained from respondents were analyzed using SPSS (Statistical Package for Social Scientists) Ver. 12.0.1 for windows

RESULTS

Only 45% of respondents who took antibiotics bothered to visit a medical doctor. When looked at from respondents occupation, Government workers both in the health sector and non health sector and students showed the highest level of obtaining antibiotics through prescription. The occupations with the lowest percentage of those getting antibiotics through prescription were mechanics, transport workers, building workers and farmers (Table 1).

Table 1. Occupation of Southern Nigerians who obtained antibiotics after prescription

Occupation	No. Of individuals	Percentage
Government worker (non-health care sector)	211	57
Government worker (healthcare sector)	78	54
Farmer	15	27
Trader	28	39
Transport	13	22
Mechanic	4	12
Building	8	24
Housewife	34	34
Unemployed	27	42
Self employed	20	35
Student	127	45
No response	33	38
Total	598	45

The survey also showed that 64% of respondents bought 10 or less antibiotic capsules/tablets while 31% of respondents bought 5 or less antibiotic capsules/tablets, clearly showing that a full course of treatment is not always taken (Table 2). It was apparent that almost 84% of respondents did not complete the full course of treatment but stopped when they felt better.

Table 2: Estimated quantity of antibiotics used for treatment by patients in Southern Nigeria.

Quantity of capsules or tablets bought	Number of Individuals	Percent
1-5	413	31.2
6-10	436	32.9
11-20	201	15.2
21-30	144	10.9
30+	52	3.9
No response	79	6.0
Total	1325	100.0

Table 3: Individuals not completing treatment after feeling well

Stop Treatment	No. of Individuals	Percent
YES	1111	83.8
NO	160	12.1
No response	54	4.1
Total	1325	100.0

Table 4: The fate of leftover medication

What is done with leftover Medication	No.of Individuals	Percent
KEEP FOR NEXT TIME	839	63.3
THROW AWAY	367	27.7
Give to someone else	69	5.2
No response	50	3.8
Total	1325	100.0

When questioned 69% of respondents admitted to keeping left over medication for further use by them or someone else.

Table 5: Purpose of antibiotics use in Southern Nigeria

Use of antibiotics	No. Of Individuals	Percent
Do not know	396	29.9
Bacterial infections	273	20.6
Pain relief	130	9.8
Wounds	75	5.7
Malaria	64	4.8
ILL Health	55	4.2
Boils	39	2.9
Stomach Ache	39	2.9
Other Infections	36	2.8
No response	28	2.1
Sores	23	1.7
Body Building	22	1.7
Anti-tetanus	19	1.4
Skin infections	17	1.3
Fever	16	1.2
Cough	14	1.1
Typhoid	14	1.1
Dysentery	13	1.0
Headache	7	.5
Fungal infection	7	.5
Colds	6	.5
Abcess	6	.5
Appendix	5	.4
Rheumatism	4	.3
Worms	4	.3
Heat	3	.2
Inflammation	3	.2
Appetite	3	.2
Tooth ache	3	.2
Blood tonic	3	.2
Swelling	3	.2
Asthma	2	.2
PMS	2	.2
TONSILITIS	1	.1
Unwanted pregnancy	1	.1
Total	1325	100.0

On asking respondents what they thought were the main role of antibiotics, more than 580 or 40% either did not know or mentioned ailments such as malaria, pain or ill health amongst others.

Ampiclox at 20% was the most used individual antibiotic, closely followed by Tetracycline at 19.5%. The type of antibiotic most used was the Penicillins at 40% which was more than double any other type used.

Table 6: List of Commonly Used antibiotics in Southern Nigeria

Name of Antibiotic	No. of Individuals	Percent	Type of Antibiotic
No response	35	2.6	-
Gentamicin	26	2.0	Aminoglycoside
Streptomycin	40	3.0	Aminoglycoside
Lincomycin	8	.6	Lincosamide
Azithromycin	6	.5	Macrolide
Erythromycin	37	2.8	Macrolide
Metronidazole	38	2.9	Nitromidazole
Chloramphenicol	75	5.7	Other
Amoxicillin	3	.2	Penicillin
Ampicillin	186	14.0	Penicillin
Ampiclox	267	20.2	Penicillin
Penicillin	76	5.7	Penicillin
Ciprofloxacin	117	8.8	Quinolone
Ofloxacin	16	1.2	Quinolone
Pefloxacin	1	.1	Quinolone
Septtrin	136	10.3	Sulfonamide
Tetracycline	258	19.5	Tetracycline
Total	1325	100.0	

DISCUSSION

The results of this study show that antibiotics can be easily obtained with or without a prescription over the counter, this includes the Qinolones such as Ciprofloxacin and Ofloxacin which are antibiotics that should not always be used as the first choice of treatment and which would increase resistance to this important class of antibiotics (Lautenbach *et al.*, 2003, and Bakken, 2004). This trend has been shown in other studies around the world (Contopoulos-Loannidis *et al.*, 2001, Vaananen *et al.*, 2006, Llor and Cots, 2009, Pechere, 2001). Only 45% of respondents obtained prescription for antibiotics. This includes, the more educated and those with better jobs. Those with manual jobs such as farmers and mechanics were less likely to visit a doctor. In Nigeria the chemist, drug store and pharmacist play an important role in the health care system especially in the more rural areas. In many villages the untrained drug dispenser is the only source of first line of medical care. At the slightest sign of illness individuals run to the chemist for treatment usually requesting treatment that can be afforded. It is not uncommon at the slight body pains, after a hard days work in the farm that an individual would buy two Paracetamol tablets and two capsules of Tetracycline (“Red and Yellow capsule). In villages that do have some government healthcare facilities they are found to be ill equipped and although should be free, the workers run their private consultancies which may be beyond the pockets of the less well off.

The dispensing of antibiotics without prescription is not the only way of antibiotic overuse and misuse. This study showed that 83% of respondents stopped taking their drugs once they felt well even though they had not finished their treatment, while 68% admitted keeping left over drugs for future use. There is no thought of expiry date of these left over medicines which in many cases are not dispensed in an original package but subdivided for retail. In these health facilities there are no laboratory facilities to carry out tests for appropriate prescription of antibiotics. Some large private surgeries/clinics where these tests are available are out of reach

of the poor. There are also private laboratories for testing but these are also expensive with untrained personnel.

The study showed that up to 44% of respondents did not know what antibiotics are and consumed them as a cure for malaria, pain and other non infectious diseases. This indicates that individuals were using antibiotics for the wrong purpose. They are unlikely to be harmed by the antibiotics but are increasing the risk of antibiotic resistance.

With this state of affairs antibiotic resistance is the likely outcome. A study in a Calabar poultry (Arikpo et al, 2006) showed some alarming resistance patterns amongst environmental microorganisms. It showed that 100% of organisms were resistant to 5 or more antibiotics tested, with every organism tested showing resistance to Cefuroxime and 97.5% resistance to Ampicillin a commonly used antibiotic. Even the newer antibiotics such as the Quinolones were also affected with 10% of organisms resistant to Ciprofloxacin and 12.5% resistant to Ofloxacin. The free use of all types of antibiotics without medical supervision does not help matters and is the likely reason for misuse or overuse of antibiotics.

The antibiotic most frequently used was Tetracycline accounting for about 20% usage. The group of antibiotics most used are the Pencillins accounting for 40% usage. The Quinolones accounted for 10% usage. The use of Quinolones may be related to affordability. It is due to the inability to afford the cost of treatment that over 30% of respondents bought 5 or less capsules only which was unlikely to be a full treatment. This in itself could lead to antibiotic resistance. In Nigeria there is also the mentality that the more expensive a drug the better it is, so those with the money to pay will always pay for the more expensive drugs.

CONCLUSION

Under the current state of affairs there is likely to be an increase in resistance to antibiotics which poses threats not only to Nigeria but the world community in general at a time when discovery of new classes of antibiotics is fast reducing. However there is very little that can be done in the short term because putting a ban on the over the counter availability of antibiotics would be a disaster, as for some people there is no alternative. Restriction of some classes of antibiotics is a possibility but considering the Nigerian situation there would still be leakages. It requires a sustained overhaul of the Nigerian Health system in a bid to make medical care affordable to the people and more education of the population on antibiotic use.

REFERENCES

- Albrich, W.C., Monnet, D.L., Harbarth, S.(2004) Antibiotic selection pressure and resistance in *Streptococcus pneumoniae* and *Streptococcus pyogenes*. *Emerg Infect Dis.*;10(3):514-7).
- Howe, R.A. (2008). Over the counter medicines. Don't include trimethoprim. *BMJ.*, 12;336 (7648):787.
- Wise, R., Hart, T., Cars O., Streulens M., Helmuth, R., Huovinen, P., and Sprenger, M., (1999). Antibiotic resistance. *BMJ* 1998; 317:609–610.
- Reeves, D.S., Finch, R.G., Bax, R.P., Davey, P.G., Po, A.L., Lingam, G. (1999). Self-medication of antibacterials without prescription (also called 'over-the-counter' use): a report of a Working Party of the British Society for Antimicrobial Chemotherapy. *J Antimicrob Chemother.* 44:163–77.
- Kahlmeter, G., Cars, O. (2001). Pan-European comparison of non-hospital antibiotic use and resistance in community *E. coli*. *Abstracts of the Forty-first Interscience Conference on Antimicrobial Agents and Chemotherapy* Chicago. Washington, DC, USA: American Society for Microbiology. 136. Abstract C2-1862.
- Goossens, H., Ferech, M., Vander Stichele, R., and Elseviers, M. (2005). Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. *Lancet.* 365:579–87.

- Austin D.J., Kristinsson, K.G., and Anderson, R.M. (1999). The relationship between the volume of antimicrobial consumption in human communities and the frequency of resistance. *Proc Natl Acad Sci U S A.*;96(3):1152-1156.
- CR-SEEDS. (2005). Cross River state economic empowerment and development strategy, Cross River State Planning Commission. Cross River State, Nigeria.
- Ross-Degnan, D., Soumerai, S.B., Goel, P.K., Bates, J., Makhulo, J., Dondi, N., et al. (1996). The impact of face-to-face educational outreach on diarrhea treatment in pharmacies. *Health Policy Plan.* 11:308–318.
- Grigoryan L., Haaijer-Ruskamp F.M., Burgerhof, J.G, Mechtler, R., Deschepper, R., Tambic-Andrasevic, A, et al. (2006). Self-medication with antimicrobial drugs in Europe. *Emerg Infect Dis.* 12(3):452-9.)
- Salako, L.A., Brieger, W.R., Afolabi, B.M., Umeh, R.E. and Agomo, P.U. (2001). Treatment of childhood fevers and other illnesses in three rural Nigerian communities. *J Trop Pediatr.* 47:230–238.
- Iweze, E.A. (1981). The patent medicine store: hospital for the urban poor. In: *The urban poor in Nigeria*. Ibadan, Nigeria: Makinwa PK, Ozo OA. ed. Evans Brother Ltd 1987; pp. 317–322.
- Lautenbach E., Lori A. Larosa, N. K., Helen, P., Peng, R.J., Maniglia, N. And Fishman, O. (2003). Fluoroquinolone Utilization in the Emergency Departments of Academic Medical Centers Prevalence of, and Risk Factors for, Inappropriate Use *Arch Intern Med.* 2003; 163:601-605.
- Bakken, J.S. (2004). The fluoroquinolones: How long will their utility last? *Scandinavian Journal of Infectious Diseases.* 36 (2): 85-92.
- Contopoulos-Loannidis, D.G., Koliofoti, I.D., Koutroumpa, I.C., Giannakakis, I.A., and Ioannidis, J.P. (2001). Pathways for inappropriate dispensing of antibiotics for rhinosinusitis: a randomized trial. *Clin Infect Dis.* 33(1):76-82.
- Vaananen, M.H., Pietila, K., Airaksinen, M. (2006). Self-medication with antibiotics--does it really happen in Europe? *Health Policy.* 77(2):166-171.
- Llor, C. and Cots, J.M. (2009). The sale of antibiotics without prescription in pharmacies in Catalonia, Spain. *Clin Infect Dis.* 48(10):1345-1349.
- Pechere, J.C. (2001). Patients' interviews and misuse of antibiotics. *Clin Infect Dis.* 33(3):170-173.
- Arikpo, G.E., Eja, M.E., Ikpeme, E.M., Ofor, U.A., Enyi-Idoh, K.H. and Udosen, G. (2006). Antibiotic resistance patterns in a Calabar poultry, Cross River State, Nigeria. *Nigerian J. Microbiology.* 20 (3): 1244-1251.