Full Length Research Paper

Pre-hospital and prescription use of antibacterial drugs at a secondary health centre in Ibadan, Nigeria

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The overall goal of this study is to reduce morbidity and mortality ascribable to bacterial infections by encouraging rational use of antibiotics. Antibiotics use prior to and prescriptions of antibiotics by the attending physicians were evaluated in a group of patients attending a secondary health facility. A quasi-exit interview was conducted using a structured questionnaire. The major presenting symptoms were sought from patients and/or parents and/or guardians; drug history was taken and doctors' prescriptions were copied onto an already prepared format. All data were entered into EPI-INFO version 6 for analyses. The mean age of patients who were enrolled was 14 ± 16.96 [range: 0.08-78 years] but males patients were statistically younger than females: respectively 9.94 ± 15.48 years (0.08-78 years) and 18.43 ±17.10 years (range: 0.08 – 70 years); F: 122 P< 0.00. Pre-hospital use of antibiotics was documented in about a third of all the patients and cotrimoxazole was the most commonly used antibiotics accounting for 68.5% of antibiotics use in this group patients. Antibiotics were contained in more than half of all the prescriptions and erythromycin and cephalosporin were antibiotics of choice. This is contrary to the previous findings in the same area of study but different health facility. There is need for formulation of appropriate drug policy and establishment of continuing medical education for doctors as well as public enlightenment programmes on rational use of antibiotics.

Key words: Antibiotics Nigeria prescription cotrimoxazole use pre-hospital.

INTRODUCTION

Infectious diseases are among the commonest causes of morbidity and mortality in most developing countries of the world (WHO. 2008). Whereas aggregate deaths and / or morbidity ascribable to infectious agents may vary for different age groups it is incontrovertible that substantial sufferings have been prevented since the discovery and introduction of antibiotics into clinical practice several decades ago. Apparently this success is being threatened by bacterial resistance and there seems to be a general attitude of helplessness and disinterest with respect to tackling the menace [Schwartz et al., 1997; Cash, 1996]. Notwithstanding the knowledge of contribution of misuse of antibacterial agents to the development and spread of drug resistance, there appears to be total lack of efforts at controlling the use of this life-saving medication amongst the general populace particularly in Nigeria and many other countries of Africa. The use of antibiotics within the hospital has also become a cause for concern as they are commonly prescribed without sound justification thus calling to question the professional competences of the attending healthcare givers (Akinyede et al., 2000; Trap and Hansen, 2002). Most hospitals in Nigeria lack guidelines for the use of antibiotics and the country lacks any antibiotics and indeed any drug policy. Rational and optimal use of antibiotics should be predicated on the right information with respect to epidemiology; ensuring the training and retraining of prescribers with respect to proper orientation to the use of antibiotics; provision of essential laboratory facilities for bacteriological diagnosis and controlling information and marketing in such way to ensure promotion and availability of the essential antibiotics. The unbridled advertisement, promotion and sale of antibiotics as currently practiced in Nigeria can only encourage antibacterial drug resistance and the attendant threat from bacteria (Akande and Ologe, 2007).

The purpose of the study was to determine the extent of pre-hospital and prescription use of antibiotics by

Table 1. Socio-biological characteristics of 1890 patients treated at Aremo Maternity Centre.

Gender	
Female: Male	1113: 777
Mean age (in years)	14.93 ±16.96
Range	[0.08 – 78]
Number of Prescription	1890
Total number of drugs	8600
Mean drug per prescription	4.55 ± 1.27
Prescription with Antibiotics (%)	50.2
Number of patients with pre-hospital medication	1290
Prescription involving injection (%)	32

patients attending a secondary health facility.

MATERIALS AND METHODS

The one year study was conducted from January to December 2008 enrolling all consenting patients treated as outpatients within the period. Each patient, parent or guardian was led through a structured questionnaire.

Location

Aremo Maternity Centre is a secondary care facility primarily for antenatal care but the centre has since inception combined its primary role with general outpatient clinic. It is located in the centre of Ibadan City, South-western part of Nigeria. The hospital draws patients mainly from Ibadan Northeast Local Area as well as part of Ibadan Southeast and Ibadan North Local Government Areas of Oyo State. Human population at Ibadan Northeast was 330,399 and the other local governments have a combined population of 572,841 as recorded in the 2006 National population census (Nigeria, 2006). Within the areas covered by these local government areas were three public owned secondary health facilities and one tertiary hospital and several private health institutions including two mission hospitals.

Clinic routine and patients

Although the facility was initially established to cater for pregnant women and therefore has facility for admission and delivery, it also provides general outpatient services for all age groups and both sexes. The general outpatient clinics are held Monday through Friday between 0900 and 1500 h with three doctors in attendance on each clinic day supported by nurses. Following full clerking, patients were given prescription and directed to the pharmacy department to obtain their drugs and sometimes required to visit laboratory for appropriate tests.

All children presenting with fever had their axillary temperature taken by the nurses and repeated using digital thermometer once referred for malarial microscopy at the malarial laboratory within the hospital. In addition such children were weighed. Details of findings with respect to malaria diagnosis and treatment are yet to be fully analyzed. All consenting patients and/or parents or guardians were taken through structured questionnaire recording presenting symptoms, pre-hospital drug use usually verifying the identity of such drugs through drug packs and bottles. The names of the prescribed drugs were thereafter recorded from the patient's prescription form. All pregnant women attending routine antenatal care and all patients who required admission and/or were referred to the designated specialized hospital for further treatment were excluded from the study.

Data analysis

The data collected were entered into EPIINFO (Anonymous, 1994) version 6 statistical package software (Erah et al., 2003) and were analyzed. Descriptive statistics including frequency, means and standard deviation were used to summarize the data. Means and proportions were compared by using student's t test or chi square, respectively and the level of significance was set at 5%.

RESULTS

One thousand eight hundred and ninety patients who satisfied inclusion criteria and consented to the protocol were enrolled into the study over a 12 month period. The patients' social-biological characteristics are summarized in Table 1.

There were 1,113 (58.9%) and 777 (41.1%) females and males, respectively. The mean age of all the patients was 14.93 ±16.96 years but mean age for males was lower than for females, respectively 9.94 + 15.48 years (0.08-78 years) and 18.43 ± 17.10 years (range: 0.08 – 70 years); F:122 P<0.00. Fever was the presenting or one of the presenting symptoms in 1,668 (88.3%) of the patients and headache was the second commonest symptom being the presenting or one of the presenting symptoms in 930 (49.2%). Six hundred and fifteen (32.5%) of the patients had cough as part of their symptom-complex, 858 (45.4%) had anorexia, diarrhoea was documented in 129 (6.8%) and 360 (19.0%) complained of abdominal pain.

One thousand two hundred and ninety patients constituting 68.2% of all the respondents had taken at least one medication prior to presentation at the hospital. A total of 628 (33.2%) of the patients had taken antibiotic prior to presentation. The choice of antibiotics included: Cotrimoxazole 430 (68.5%); Penicillins 16 (2.5%); Cephalosporin 2 (0.3%); Chloramphenicol 17 (2.7%) and the

Table 2. Choice of pre-hospital or prescription use of antibiotics at Aremo Maternity Centre.

Antibiotics Prescription	Pre-hospital	Hospital	Statistics
Cephalosporins (%)	0.3	32.3	X^2: 247 P< 0.00
Cotrimoxazole (%)	68.5	1.2	X^2: 903 P< 0.00
Erythromycin (%)	-	33.4	
Penicillins (%)	2.5	10.2	X^2: 33.4 P< 0.00
Quinolones (%)	-	14.2	
Chloramphenicol (%)	2.7	0.2	
Others (e.g. metronidazole, Tetracycline etc (%)	26	8.6	
Antibiotics use (%)	32	50.2	

others (25.9%). In addition to antibiotics antipyretic/analgesic such as Paracetamol 826 (43.7%) Dipyrone 12 and Ibuprofen 12); antimalarial drugs namely Chloroquine (232 or 12.3%); Sulphadoxine - Pyrimethamine (63 or 3.3%) and others including Amodiaquine, Artesunate (17 or 0.9%) were commonly used prior to hospital presentation. The mean number of drugs per prescription was 4.55 ± 1.27 for all the patients and 4.62 ± 1.25 in patients who presented with fever. Injection was prescribed in 31.7% of the cases, injection comprising mainly antimalarial, antiemetic/antihistamine drugs. Generic names of drugs were used in 57.9% of all the prescriptions with most drugs been contained in the essential drug list, that is, 91.1%.

A total number of 1040 antibiotics were prescribed to 948 patients with 549 or 49.3% of female patients and 399 or 51.4% of male patients receiving one or more antibiotics. In all, antibiotic prescription rate in the group of patients was 50.2%. Most, 864 or 91.1% of the recipients of antibiotics prescription received only one antibiotic while the remaining 84 received more than one antibiotic. The mean age of recipients of antibiotics prescription was 10.06 ± 14.56 years (range 0.08–67 years). The mean age of patients who received antibiotics was statistically lower than the mean age of all patients involved in this study, 10.06 ± 14.56 versus 14.93 ± 16.96; F: 22.2, p < 0.00.

Erythromycin and Cephalosporins were each prescribed in about a third of all encounters containing antibiotics respectively, 347 (33.4%) and 336 (32.3%); whereas Quinolones and Penicillins occupied distant 3rd and 4th, respectively with 148 (14.2%) and 106 (10.2%). Only 12 or 1.2% patients received Cotrimoxazole contrary to what was observed with pre-hospital choice of antibiotics (Table 2). It was also observed that pre-hospital use of Cephalosporins such as Cefuroxime and Cephalexin as well as Erythromycin was rather scant.

DISCUSSION

In this study, male and female patients were similarly represented and both received similar profile of drugs including antibacterial agents which were prescribed for 51 and 49% of males and females, respectively. It has been previously observed that relatively higher proportion of males than females received antibiotics (Fehintola et al 2006). Perhaps, the observed trend in this study can be described as providing a scant support of that observation or at least not a negation. It is of special note that antibiotics were prescribed in more than half of the encounters documented in this study and about a third of all these patients had already commenced antibiotics prior to hospital presentation. Antibiotics prescription rate in this study is similar to findings in the area (Akinyede et al., 2000; Enwere et al., 2007). Fever was the commonest symptom and was often assumed to mean infection as patients easily took to antimicrobial use similar findings were documented by Ajayi and Falade (2006) in a population of patients attending the general outpatient clinic of a tertiary hospital in the same area (Ajayi and Falade, 2006). It is pleasing to note that most prescribed drugs were contained in the National Formulary and similar findings were documented by previous studies in the same area (Enwere et al., 2007; Akande and Ologe, 2007; Erah et al., 2003). The injection rate was rather high and prescription in generic was low in this study. The relatively high injection rate as well as high rate of prescription of antibiotics recorded is comparable to similar studies in Nigeria. The high rate of injection in this study may be as a result of the relatively young population of patients, perhaps confounded by the absence of any treatment guidelines in the hospital. The relatively very high compliance with essential drug list might have been imposed by a combination of ease of accessibility and relatively poor economic status of the patients who attended this clinic and may also be plausi-ble with most health facilities in the country (Akinyede et al., 2000; Akande and Ologe, 2007; Ibrahim, 2004). The relatively high rate of prescription of antibiotics may suggest tendency to over-diagnose bacterial infections with-out taking cognizance of the fact that many acute febrile illnesses were due to viral infections. Akinyede et al. (2000) recorded even higher proportions of antibiotic use but it could be reasoned that in-patients were included in their study (Akinyede et al., 2000). Interestingly, the patients' seemingly premature recourse to antibiotic use was either strengthened by the attitude of these doctors or sometimes served as basis for pressure on them to also

prescribe antibiotics. With most febrile illness passing for infective and even self-limiting viral illnesses been treated with antibiotics the situation for exposing bacteria to sub-therapeutic concentration of these antibiotics becomes established and drug resistance is encouraged.

This study revealed that Cotrimoxazole was highly favoured by patients attending this hospital and it is believed that this is the first study in this environment that attempted to assess pre-hospital use and prescription use of antibiotics in the same group of patients. That about a third of these patients had used antibiotics prior to attending hospital is very worrisome and it is opined that the fact that antibiotics and indeed almost any drug can be obtained over the counter is an immediate cause of this dangerous trend. It is also known that Cotrimoxazole is inexpensive thus further predisposing to its misuse. The relatively low frequency of prescription of Cotrimoxazole in this study when compared to previous studies in the same area may not be easily explainable (Akinyede et al., 2000; Fehintola et al., 2006). However, the doctors might have chosen to prescribe alternative antibiotics simply because large proportion of the patients had already taken the same drug without apparent improvement. On the other hand it is gladdening that Quinolones such as Ciprofloxacin and Cephalosporins were infrequently administered prior to hospital presentation. Both Cephalosporins such as Cephalexin and Zerufoxime as well as Erythromycin remain effective in bacterial respiratory tract infection (Osoagbaka, 1990; Okesola and Ige, 2008) which is known to account for high morbidity and mortality especially in childhood. The infrequent pre-hospital use of these drugs should be a welcome observation. If the hospital prescription of these drugs and other antibiotics could be based on rational use and coupled with control of sale and distribution of antibiotics it would be possible to extend usefulness of these drugs. The need to ensure rational use of antibiotics cannot be overemphasized. A number of factors militate against rational antibiotic use; notable ones include: unrestricted access, pressure from patients and drug companies as well as inadequate laboratory support. Other important issues include inadequate knowledge epidemiology and non-availability of treatment guidelines in many our hospitals. Therefore optimal use of antibiotics will require well formulated policy including control of sale and distribution of antibiotics; training and retraining of prescribers with a view to ensuring proper use of antibiotics; provision of basic laboratory facilities to carry out simple bacteriological test; relevant and regular epidemiological surveys and study of cultural practices that impact on antibiotics use within the community. The rational use of antibiotics would help to limit as much as possible the appearance and spread of resistant strains, which in the long run threaten our chances of effectively controlling the infectious diseases In conclusion, antibiotics were commonly used prior to presentation at Aremo Maternity Centre and there was high rate of antibiotics prescription by the doctors at this hospital. Cotrimoxazole was the most prevalent antibiotic used prior to attending the hospital whereas erythromycin and Cephalosporins were favoured by the doctors at the hospital. The easy accessibility of patients to antibiotics and the absence of national policy on antibiotics are unhealthy and require urgent attention.

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