ABOUT JCMR

The Journal of Clinical Medicine and Research (JCMR) is published monthly (one volume per year) by Academic Journals.

Journal of Clinical Medicine and Research (JCMR) is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as cardiology, critical care medicine, Family Medicine, geriatrics, pediatrics etc.

The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in JCMR are peer-reviewed.

Submission of Manuscript

Submit manuscripts as e-mail attachment to the Editorial Office at: jcmr@academicjournals.org. A manuscript number will be mailed to the corresponding author shortly after submission.

For all other correspondence that cannot be sent by e-mail, please contact the editorial office (at jcmr@academicjournals.org).

The Journal of Clinical Medicine and Research will only accept manuscripts submitted as e-mail attachments.

Please read the Instructions for Authors before submitting your manuscript. The manuscript files should be given the last name of the first author.
Editors

Prof. Neveen Helmy Ahmed Aboelsoud,  
*Complementary Medicine Researches & Applications (CAM)*,  
National Research Center,  
Research St (Tahrir),  
Dokki, Cairo,  
Egypt.

Prof. Bodh Raj Panhotra,  
*Department of Medical Microbiology, Medical Laboratory Technology & Clinical Sciences, Sardar Bhagwan Singh Postgraduate Institute of Biomedical Sciences & Research*,  
Balawala, Dehradun,  
India.

Editorial Board

Prof. Ahmed BaHammam,  
*King Saud University*,  
Saudi Arabia.

Dr. Ellen Rosskam,  
Senior Scholar, *Woodrow Wilson International Center for Scholars*,  
Washington, D.C.,  
Adjunct Professor, *University of Massachusetts, Lowell*,  
Visiting Senior Fellow, *University of Surrey*,  
Faculty of Health and Medical Sciences, *England, Switzerland*.

Dr. Philippe Connes,  
*National Institute of Health and Medical Research (763)*,  
Academic Hospital of *Pointe a Pitre*,  
Guadeloupe (French West Indies),  
Guadeloupe.

Dr. Robert G Bota,  
*University of Missouri*,  
Kansas City,  
USA.

Dr. Haiyang Zhou,  
*Department of General Surgery*,  
Changzheng Hospital,  
Second Military Medical University,  
China.

Dr. Jimmy Jose,  
*SAC College of Pharmacy*,  
Karnataka,  
India.

Dr. Carlos A. Feldstein,  
*Hospital de Clinicas Jose de San Martin*,  
Av. Cordoba 2351 Buenos Aires 1120,  
Argentina.

Dr. Fadia Mostafa Attia,  
*Faculty of Medicine*,  
Suez Canal University,  
Egypt.

Dr. Hamza Mujagic,  
*Massachusetts General Hospital*,  
USA.

Dr. O.U.J. Umeora,  
*Ebonyi State University/Teaching Hospital*,  
Nigeria.
Electronic submission of manuscripts is strongly encouraged, provided that the text, tables, and figures are included in a single Microsoft Word file (preferably in Arial font).

The cover letter should include the corresponding author’s full address and telephone/fax numbers and should be in an e-mail message sent to the Editor, with the file, whose name should begin with the first author’s surname, as an attachment.

Article Types
Three types of manuscripts may be submitted:

Regular articles: These should describe new and carefully confirmed findings, and experimental procedures should be given in sufficient detail for others to verify the work. The length of a full paper should be the minimum required to describe and interpret the work clearly.

Short Communications: A Short Communication is suitable for recording the results of complete small investigations or giving details of new models or hypotheses, innovative methods, techniques or apparatus. The style of main sections need not conform to that of full-length papers. Short communications are 2 to 4 printed pages (about 6 to 12 manuscript pages) in length.

Reviews: Submissions of reviews and perspectives covering topics of current interest are welcome and encouraged. Reviews should be concise and no longer than 4-6 printed pages (about 12 to 18 manuscript pages). Reviews are also peer-reviewed.

Review Process
All manuscripts are reviewed by an editor and members of the Editorial Board or qualified outside reviewers. Authors cannot nominate reviewers. Only reviewers randomly selected from our database with specialization in the subject area will be contacted to evaluate the manuscripts. The process will be blind review. Decisions will be made as rapidly as possible, and the journal strives to return reviewers’ comments to authors as fast as possible. The editorial board will re-review manuscripts that are accepted pending revision. It is the goal of the JCMR to publish manuscripts within weeks after submission.

Regular articles
All portions of the manuscript must be typed double-spaced and all pages numbered starting from the title page. The Title should be a brief phrase describing the contents of the paper. The Title Page should include the authors’ full names and affiliations, the name of the corresponding author along with phone, fax and E-mail information. Present addresses of authors should appear as a footnote.

The Abstract should be informative and completely self-explanatory, briefly present the topic, state the scope of the experiments, indicate significant data, and point out major findings and conclusions. The Abstract should be 100 to 200 words in length. Complete sentences, active verbs, and the third person should be used, and the abstract should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. No literature should be cited. Following the abstract, about 3 to 10 key words that will provide indexing references should be listed.

A list of non-standard Abbreviations should be added. In general, non-standard abbreviations should be used only when the full term is very long and used often. Each abbreviation should be spelled out and introduced in parentheses the first time it is used in the text. Only recommended SI units should be used. Authors should use the solidus presentation (mg/ml). Standard abbreviations (such as ATP and DNA) need not be defined.

The Introduction should provide a clear statement of the problem, the relevant literature on the subject, and the proposed approach or solution. It should be understandable to colleagues from a broad range of scientific disciplines.

Materials and methods should be complete enough to allow experiments to be reproduced. However, only truly new procedures should be described in detail; previously published procedures should be cited, and important modifications of published procedures should be mentioned briefly. Capitalize trade names and include the manufacturer's name and address. Subheadings should be used. Methods in general use need not be described in detail.
**Results** should be presented with clarity and precision. The results should be written in the past tense when describing findings in the authors’ experiments. Previously published findings should be written in the present tense. Results should be explained, but largely without referring to the literature. Discussion, speculation and detailed interpretation of data should not be included in the Results but should be put into the Discussion section.

The **Discussion** should interpret the findings in view of the results obtained in this and in past studies on this topic. State the conclusions in a few sentences at the end of the paper. The Results and Discussion sections can include subheadings, and when appropriate, both sections can be combined.

The **Acknowledgments** of people, grants, funds, etc should be brief. **Tables** should be kept to a minimum and be designed to be as simple as possible. Tables are to be typed double-spaced throughout, including headings and footnotes. Each table should be on a separate page, numbered consecutively in Arabic numerals and supplied with a heading and a legend. Tables should be self-explanatory without reference to the text. The details of the methods used in the experiments should preferably be described in the legend instead of in the text. The same data should not be presented in both table and graph form or repeated in the text.

**Figure legends** should be typed in numerical order on a separate sheet. Graphics should be prepared using applications capable of generating high resolution GIF, TIFF, JPEG or Powerpoint before pasting in the Microsoft Word manuscript file. Tables should be prepared in Microsoft Word. Use Arabic numerals to designate figures and upper case letters for their parts (Figure 1). Begin each legend with a title and include sufficient description so that the figure is understandable without reading the text of the manuscript. Information given in legends should not be repeated in the text.

**References:** In the text, a reference identified by means of an author’s name should be followed by the date of the reference in parentheses. When there are more than two authors, only the first author’s name should be mentioned, followed by ‘et al.’ In the event that an author cited has had two or more works published during the same year, the reference, both in the text and in the reference list, should be identified by a lower case letter like ‘a’ and ‘b’ after the date to distinguish the works.

**Examples:**

Nishimura (2000), Agindotan et al. (2003), (Kelebeni, 1983), (Usman and Smith, 2001), (Chege, 1998; Stein, 1987a,b; Tijani, 1993,1995),[Kumasi et al., 2001]

References should be listed at the end of the paper in alphabetical order. Articles in preparation or articles submitted for publication, unpublished observations, personal communications, etc. should not be included in the reference list but should only be mentioned in the article text (e.g., A. Kingori, University of Nairobi, Kenya, personal communication). Journal names are abbreviated according to Chemical Abstracts. Authors are fully responsible for the accuracy of the references.

**Examples:**


Case Studies

Case Studies include original case reports that will deepen the understanding of general medical knowledge.

The **Title** should be a brief phrase describing the contents of the paper. The Title Page should include the authors’ full names and affiliations, the name of the corresponding author along with phone, fax and E-mail information. Present addresses of authors should appear as a footnote.

The **Abstract** should be informative and completely self-explanatory, briefly present the topic, state the scope of the experiments, indicate significant data, and point out major findings and conclusions. The Abstract should be 100 to 200 words in length. Complete sentences, active verbs, and the third person should be used, and the abstract should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. No literature should be cited.

Following the abstract, about 3 to 10 **key words** that will provide indexing references should be listed.

A list of non-standard **Abbreviations** should be added. In general, non-standard abbreviations should be used only when the full term is very long and used often. Each abbreviation should be spelled out and introduced in parentheses the first time it is used in the text. Only recommended SI units should be used. Authors should use the solidus presentation (mg/ml).

The **Introduction** should provide a clear statement of the problem, the relevant literature on the subject, and the proposed approach or solution. It should be understandable to colleagues from a broad range of scientific disciplines. The presentation of the case study should include the important information regarding the case. This must include the medical history, demographics, symptoms, tests etc. Kindly note that all information that will lead to the identification of the particular patient(s) must be excluded.

The conclusion should highlight the contribution of the study and its relevance in general medical knowledge.

The **Acknowledgments** of people, grants, funds, etc should be brief.

**References:** Same as in regular articles

---

Short Communications

Short Communications are limited to a maximum of two figures and one table. They should present a complete study that is more limited in scope than is found in full-length papers. The items of manuscript preparation listed above apply to Short Communications with the following differences: (1) Abstracts are limited to 100 words; (2) instead of a separate Materials and Methods section, experimental procedures may be incorporated into Figure Legends and Table footnotes; (3) Results and Discussion should be combined into a single section.

**Proofs and Reprints:** Electronic proofs will be sent (e-mail attachment) to the corresponding author as a PDF file. Page proofs are considered to be the final version of the manuscript. With the exception of typographical or minor clerical errors, no changes will be made in the manuscript at the proof stage. Because IJMMS will be published freely online to attract a wide audience, authors will have free electronic access to the full text (in both HTML and PDF) of the article. Authors can freely download the PDF file from which they can print unlimited copies of their articles.
Fees and Charges: Authors are required to pay a $550 handling fee. Publication of an article in the Journal of Clinical Medicine and Research is not contingent upon the author’s ability to pay the charges. Neither is acceptance to pay the handling fee a guarantee that the paper will be accepted for publication. Authors may still request (in advance) that the editorial office waive some of the handling fee under special circumstances.

All rights Reserved. In accessing this journal, you agree that you will access the contents for your own personal use but not for any commercial use. Any use and or copies of this Journal in whole or in part must include the customary bibliographic citation, including author attribution, date and article title.

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, or thesis) that it is not under consideration for publication elsewhere; that if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher.

Disclaimer of Warranties
In no event shall Academic Journals be liable for any special, incidental, indirect, or consequential damages of any kind arising out of or in connection with the use of the articles or other material derived from the JCMR, whether or not advised of the possibility of damage, and on any theory of liability.
This publication is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Descriptions of, or references to, products or publications does not imply endorsement of that product or publication.
While every effort is made by Academic Journals to see that no inaccurate or misleading data, opinion or statements appear in this publication, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the responsibility of the contributor or advertiser concerned. Academic Journals makes no warranty of any kind, either express or implied, regarding the quality, accuracy, availability, or validity of the data or information in this publication or of any other publication to which it may be linked.
ARTICLES

Research Articles

Epistaxis in Kaduna, Nigeria: A review of 101 cases in a resource constrained setting
A. S. Labaran, E. Musa, A. M. Kodiya, G. M. Mohammed and B. M. Ahmad 1

Comparative in vitro potency of four fluoroquinolones on clinical isolates over a year period
Epistaxis in Kaduna, Nigeria: A review of 101 cases in a resource constrained setting

A. S. Labaran, E. Musa, A. M. Kodiya*, G. M. Mohammed and B. M. Ahmad

National Ear Care Centre, Kaduna, Nigeria.

Accepted 17 December, 2013

Epistaxis is defined as hemorrhage from the nostril, nasal cavity, or nasopharynx. Sufferers and clinicians may develop significant anxiety despite the fact that majority of patients may be treated successfully by the first attending physician. The objective of this study was to review the incidence, common etiological factors and management modalities of epistaxis in a resource constrained setting. It is a retrospective review of 101 patients seen with epistaxis over 7 years at National Ear Care Centre, Kaduna from January 2002 to December 2008. The age of patients reviewed ranged between 2 and 75 years. An incidence of 0.5% was recorded and slight male preponderance with a male:female ratio of 1.4:1. Dry-hot and cold harmattan weather had the highest prevalence. Trauma and infections were the main etiological factors identified, but over 40% had no discernable cause. About 25% presented with active bleeding and 10.98% required admission. All were managed conservatively. Less than 2% had blood transfusion. Epitaxis is a common rhinological emergency that requires prompt intervention to reduce morbidity and prevent mortality. Conservative intervention was a satisfactory approach in this study.

Key words: Epistaxis, resource constrained, conservative management.

INTRODUCTION

Bleeding from the nose and nasopharynx is a common symptom of diverse conditions which may present as mild recurrent bleeds or severe life threatening rhinological emergency and may pose a challenge to even a skilled otolaryngologist (Nnnennia, 2004). Globally, the true incidence remained unknown, but it is estimated that 60% of the population will at least have an episode of epistaxis in their life time and 6% of them will seek medical attention (Saubrabh and Saxena, 2005). A slight male preponderance with 55% male and 45% female has been reported (Nnnennia, 2004; Saubrabh and Saxena, 2005; Gerald, 2008). It is rare in neonates but common among children and young adults and peaks in the sixth decade giving a bi-modal age presentation (Saubrabh and Saxena, 2005; Gerald, 2008). Epistaxis is said to be commoner in the cold winter and during the hot dry climate.

The nasal mucosa is richly supplied by branches of both the external and internal carotid arteries with rich anastomoses. The Kiesselbach’s plexus is responsible for most anterior epistaxis accounting for 85 to 95%, but easy to identify and treat. Posterior epistaxis which constitute 5 to 15% are often more severe, difficult to locate and treat. A structured clinical classification into either primary or secondary, childhood or adult and anterior or posterior epistaxis is preferred over the traditional classification based on local and systemic causes (Gerald, 2008). This is because majority of cases have no identifiable cause. The goals of therapy in epistaxis are to control hemorrhage, reduce hospital stay and limit complications in a cost effective way. The best treatment modality to
achieve these goals is however a matter of great debate (Nnnennia, 2004; Saubrabh and Saxena, 2005). Resuscitation where indicated is mandatory. Specific treatment can be conservative or surgical. Conservative methods include cauterization and nasal packing. Surgical methods involve ligation of feeding vessels and septoplasty. However, modern approaches include endoscopic ligation and embolization. This study presents our experience in managing epistaxis in a resource constrained setting.

MATERIALS AND METHODS

This is a retrospective review of 101 patients seen over a period of 7 years at the National Ear Care Centre, Kaduna from January 2002 to December 2008. This period coincided with the time when the centre used one site for administration, another hospital for clinics and admission and yet another hospital for theatre space.

Out-patient and in-patient registers were used and medical records of patients seen during the period under review were retrieved. Parameters extracted include demographics, concomitant medical conditions, drug history, month of presentation, trigger of bleeding, treatment modality, complications, length of hospital stay and examination findings. The data was analyzed using simple statistical methods.

RESULTS

A total of 20,308 patients were seen at the centre during the period under review. Of this number, 101 patients (0.5%) had epistaxis as a presenting complain.

Figure 1 shows age distribution of patients with epistaxis. Age ranged from 2 to 75 years, with mean of 30.4 years. Peak presentations were recorded among age groups 1 to 10 years (40.6%) and 31 to 40 years (33.6%). Only 11 patients (10.89%) required admission. Of this number, 2 had blood transfusion. Hospital stay ranged 2 to 4 days with an average of 3 days.

Table 2 shows the associated aetiological factors. Idiopathic causes accounts for about 46% and trauma (15.8%), while infections constitute 11.9%.

Table 3 shows treatment modalities offered to the 25 cases with active epistaxis at presentation. Of this number, 52% had anterior nasal pack, 16% had both anterior and posterior nasal packs, while 32% benefitted from cautery.

DISCUSSION

Inspite of the anxiety generated by nose bleeding, cure can be achieved by the first attending physician if prompt and appropriate intervention is made. Epistaxis is a common symptom in ENT practice (Nnnennia, 2004; Saubrabh and Saxena, 2005; Gerald, 2008; Ijaduola and Okeowo, 1983). In this study, its incidence was 0.5%. The age ranged from 2 to 75 years with mean age of 30.49 years and male to female ratio of 1.4:1. These findings agree with that of Mgbor (2004) who also reported similar findings in a study carried out in Enugu, South Eastern Nigeria. Bimodal age presentation with peaks at age groups 1 to 20 and 31 to 40 years was observed. Adult epistaxis has been reported to be commoner in the sixth decade of life (Saubrabh and Saxena, 2005; Gerald, 2008); this is in contrast with the findings in this study of forth decade. Perhaps this may be due to small proportion of the aged in this environment owing to low life expectancy. Increased incidence in cold harmattan months and the hot/dry months have been reported (Gerald, 2004) which agrees with the findings of
Table 1. Distribution by month of presentation.

<table>
<thead>
<tr>
<th>Month of the year</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>8</td>
<td>7.92</td>
</tr>
<tr>
<td>February</td>
<td>6</td>
<td>5.94</td>
</tr>
<tr>
<td>March</td>
<td>8</td>
<td>7.92</td>
</tr>
<tr>
<td>April</td>
<td>11</td>
<td>10.89</td>
</tr>
<tr>
<td>May</td>
<td>2</td>
<td>1.98</td>
</tr>
<tr>
<td>June</td>
<td>5</td>
<td>4.95</td>
</tr>
<tr>
<td>July</td>
<td>9</td>
<td>8.91</td>
</tr>
<tr>
<td>August</td>
<td>7</td>
<td>6.93</td>
</tr>
<tr>
<td>September</td>
<td>6</td>
<td>5.94</td>
</tr>
<tr>
<td>October</td>
<td>13</td>
<td>12.87</td>
</tr>
<tr>
<td>November</td>
<td>14</td>
<td>13.86</td>
</tr>
<tr>
<td>December</td>
<td>10</td>
<td>9.90</td>
</tr>
</tbody>
</table>

Table 2. Distribution by aetiological factor.

<table>
<thead>
<tr>
<th>Aetiological factors</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiopathic</td>
<td>45</td>
<td>45.55</td>
</tr>
<tr>
<td>Trauma</td>
<td>16</td>
<td>15.84</td>
</tr>
<tr>
<td>Hypertension</td>
<td>13</td>
<td>12.87</td>
</tr>
<tr>
<td>Infections</td>
<td>12</td>
<td>11.88</td>
</tr>
<tr>
<td>Tumours</td>
<td>5</td>
<td>4.95</td>
</tr>
<tr>
<td>Blood dyscrasias</td>
<td>4</td>
<td>3.96</td>
</tr>
<tr>
<td>Chronic liver disease</td>
<td>3</td>
<td>2.97</td>
</tr>
<tr>
<td>Foreign Body</td>
<td>1</td>
<td>0.99</td>
</tr>
<tr>
<td>Drug induced</td>
<td>1</td>
<td>0.99</td>
</tr>
<tr>
<td>Deviated nasal septum</td>
<td>1</td>
<td>0.99</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Treatment modalities.

<table>
<thead>
<tr>
<th>Treatment modality</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior nasal packing</td>
<td>13</td>
<td>52</td>
</tr>
<tr>
<td>Anterior and posterior nasal packing</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Cauterization</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

this study as shown in Table 1. This also agrees with the report of Bhatia and Varughese (1987) in Jos who attributed the increased incidence to high wind velocity and dryness which favour crust formation in the nasal cavity.

There must be a committed search for the bleeder as well as a deliberate effort to find the cause of epistaxis (Gerald, 2008; Dounil et al., 1999; Jeselius, 1974), because too many cases of epistaxis are grouped as idiopathic or primary which may not necessarily be so. In this study, 45.55% of the cases were idiopathic. This is similar to findings of Mgbor (2004). With more resources/better equipment and careful examination, this figure may likely decrease. Trauma, infections and tumours were noted as shown in Table 2. Varshney and Saxena (2005) however reported cardiovascular diseases (including hypertension and arteriosclerosis), infection and trauma in decreasing importance as leading cause of secondary epistaxis in their study. In this series, about 13% of patients had hypertension without any identifiable cause of epistaxis, but it was observed that 3 patients who had epistaxis secondary to trauma and 1 patient due to blood dyscrasias also had hypertension. Bleeding was also more severe among the hypertensives. It is possible that
with committed search one could find the real cause of epistaxis in these hypertensives. Elima and Knopfholz (2000) reported that epistaxis is unlikely to be a hypertensive emergency. Also, a number of large studies have failed to show causal relationship between hypertension and epistaxis (Lubianca-Neto et al., 1998).

The bleeding point if found is cauterized either with silver nitrate or electro cautery. Failure to find the bleeding point leads to anterior nasal pack with paraffin gauze, gloved finger or rarely merocele when available. Fifty two percent were successfully managed with anterior nasal packs alone, 16% with posterior nasal pack using Foleys catheter inflated with air in addition to anterior nasal pack with paraffin gauze under local anaesthesia. All patients with nasal packs were given prophylactic antibiotics. Nasal packs were removed between 24 and 48 h. Most patients were discharged home on the third day of admission. There was no mortality recorded and this is similar to Urashi et al. (2004).

Epistaxis is a common symptom which presents often as recurrent minor bleeds, but not infrequently as acute severe episode requiring emergency care. Thorough patient evaluation is mandatory for appropriate management. More purposeful search for etiological factors by the attending surgeon and identification of bleeding point must be encouraged. Conservative management was very effective despite resource constrain.

REFERENCES

Full Length Research Paper

Comparative in vitro potency of four fluoroquinolones on clinical isolates over a year period


1Department of Biological Sciences, Afe Babalola University Ado Ekiti, Nigeria.  
2Department of Biosciences and Biotechnology, Babcock University, Nigeria.  
3Department of Mathematical and Physical Sciences, Afe Babalola University Ado Ekiti, Nigeria.  
4Department of Veterinary Microbiology and Parasitology, University of Ibadan, Ibadan, Oyo State Nigeria.

Accepted 16 December, 2013

This study aimed at evaluating the efficacy of four common fluoroquinolone drugs over a year period on some clinical isolates. It also aimed at comparing statistically the average effects of each drug on the isolates. Five different clinical samples (urine, sputum, wound, blood and high vaginal swab [HVS]) from patients attending a university medical centre (between June 2011 and May 2012) were analysed for the purpose of bacteria isolation. The isolates were tested with commonly used fluoroquinolones: pefloxacin (30 µg), ofloxacin (30 µg), sparfloxacin (10 µg), and ciprofloxacin (10 µg). Each sensitivity test was done in duplicate and a mean average of zone of inhibition was recorded. One hundred and eighty eight bacteria were isolated: Staphylococcus aureus (44.7%), Streptococcus pyogenes (6.4%), Escherichia coli (28.2%), Pseudomonas aeruginosa (8.5%), Klebsiella pneumonia (8.0%), and Proteus mirabilis (4.3%). All drugs were equally potent against the isolates, but a higher potency was seen in ofloxacin against P. mirabilis. The fluoroquinolones are a group of broad spectrum drugs effective in clinical cases. Their efficacy should be preserved by ensuring strict compliance to local drug policies.

Key words: Clinical, fluoroquinolones, efficacy.

INTRODUCTION

The health and well-being of human populations relies, in large, on the control of communicable diseases, as well as the availability of efficient and potent drugs for treatments of such diseases. Infectious diseases continue to take a toll, especially in most developing countries, accounting for nearly 50% of all deaths. The introduction of antimicrobial agents in the early 20th century brought a great relief in medicine; however, this relief was not to endure a while, especially due to the indiscriminate and uncontrolled use of these agents. Resistance, an unfriendly term in medicine, became a global problem when frequently used antimicrobials in human and veterinary medicine were observed to be impotent against known bacterial infections (Smith, 1999). Serious infections, notably in hospitals and other health care facilities are associated with the emergence of antibiotic-resistant organisms, and these organisms appear to be biologically competent to cause serious threat to life (Schwartz et al., 1997; Spellberg et al., 2008; Mulvey and Simor, 2009; Sibi et al., 2011; Taddele et al., 2012). The principal area of concern to this has been the increasing emergence of resistant phenotypes in both clinically relevant strains and normal commensal microbiota (Chikwendu et al., 2008).

Fluoroquinolones, as a class of drugs, have gained some importance during the last two decades because of their potent antibacterial activity against wide varieties of Gram positive and Gram negative pathogenic bacteria.

*Corresponding author. E-mail: jmajnr@yahoo.com.
with minimum toxic side effects and a different mechanism of action than other available antibacterial drugs (Talah and Gadad, 2006). To date, many fluoroquinolones have been introduced into clinical use with significant improvement in antibacterial spectrum and activity, thus forming an invaluable part of the present anti-infective armoury of the clinicians. This group of drugs are increasingly being used in both the hospital and community sectors to treat a broad range of infections (Bhanot et al., 2001). However, increased use has led to recent emergence of fluoroquinolone-resistant bacteria which has necessitated the search for newer drugs worldwide (Shindikar and Viswanthan, 2005; Foroumadi et al., 2006). Along with known mechanisms of resistance is the presence of fluoroquinolone resistant proteins (Qnr), codified by transmissible genes by means of plasmids, especially in Enterobacter species, Escherichia coli, and Klebsiella pneumonia (Luzzaro, 2008). Additionally, new specific resistance mechanisms have been described. AAC(6')-Ib-cr represents the first enzyme able to inactivate, by acetylation, antimicrobials of two different classes, aminoglycosides and fluoroquinolones; and an efflux-pump plasmid-mediated, codified by the QepA gene, acts as a selective mechanism (Luzzaro, 2008). In an over nine years of study, Adam et al. (2009) identified a significant strong relationship between increase in fluoroquinolone usage and rise in ciprofloxacin resistance in Streptococcus pneumonia from 0 to 4.5% in children (0 to 15 years), 0.2 to 5.4% in adults (16 to 64 years), and 1.4 to 11.6% in the elderly (≥65 years). In the last several years, resistance to fluoroquinolone has remained very high among methicillin-resistant Staphylococcus aureus (MRSA) strains in intensive care unit (ICU) patients, and it has increased among nosocomial isolates of K. pneumonia, Serratia marcescens and Pseudomonas aeruginosa. More worrisome are reports of an overall increase in resistance to fluoroquinolone among bacteria of community-acquired infections such as E. coli, Salmonella species, Campylobacter species and Neisseria gonorrhoeae (Acar and Goldstein, 1997). A research carried out in Imo State, Nigeria reports a high occurrence of resistance to ciprofloxacin in S. aureus isolated from medical samples (Ugbogu et al., 2007). In the same vein, Lamikanra et al. (2011) confirmed that the increase and uncontrolled use of fluoroquinolones paved way for resistance among E. coli in Nigeria. However, Olufunmilola et al. (2012) established the efficacy of fluoroquinolones in the treatment of typhoid fever in Ibadan despite evidence of emerging resistance. This study aimed at evaluating the efficacy of four common fluoroquinolone drugs over a year period on some clinical isolates.

METHODOLOGY

Five different clinical samples (urine, sputum, wound, blood and high vaginal swab [HVS]) from patients being attended to at a university medical centre (between June 2011 and May 2012) were analysed for the purpose of bacteria isolation on CLED, Mannitol salt, McConkey, EMB and Nutrient agars. A total of one hundred and twenty eight samples in all were analysed; thirty two samples per quarter. Isolates were characterised and identified in reference to Cowan and Stell (1993).

All isolates, suspended in normal saline at a density in comparison to 0.5 McFarland standard were subjected to antibiotic sensitivity test using disc diffusion method on Mueller Hinton agar (Oxoid, UK) (CLSI, 2006). The isolates were tested with commonly used fluoroquinolones; pefloxacin (30 µg), ofloxacin (30 µg), sparfloxacin (10 µg), and ciprofloxacin (10 µg). Each sensitivity test was done in duplicate and a mean average of zone of inhibition was recorded.

Statistical analysis

Analysis of variance (ANOVA) was applied to compare the average effect of the four fluoroquinolones on all isolates at 5% significant level.

RESULTS

From all the samples analysed, a total of one hundred and eighty-eight bacteria was isolated. Ninety six (96) were Gram positive isolates, while ninety two (92) were Gram negative isolates. Isolates were mostly of six species; S. aureus (44.7%), Streptococcus pyogenes (6.4%), E. coli (28.2%), P. aeruginosa (8.5%), K. pneumonia (8.0%), and Proteus mirabilis (4.3%). Urine samples had the highest number of isolates at 57.5%, while sputum and blood samples equally yielded the least number of isolates at 4.3% (Table 1 and Figure 1).

The antibiotic sensitivity test (AST) for the period of the study showed varying sizes of zone of inhibition in

<table>
<thead>
<tr>
<th>Table 1. Isolates per clinical sample.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isolate</strong></td>
</tr>
<tr>
<td>E. coli</td>
</tr>
<tr>
<td>S. aureus</td>
</tr>
<tr>
<td>P. aeruginosa</td>
</tr>
<tr>
<td>K. pneumoniae</td>
</tr>
<tr>
<td>P. mirabilis</td>
</tr>
<tr>
<td>S. pyogenes</td>
</tr>
</tbody>
</table>
Table 2. The overall average zone of inhibition in millimetres (mm).

<table>
<thead>
<tr>
<th>Isolate</th>
<th>P</th>
<th>O</th>
<th>S</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>21.3</td>
<td>21.6</td>
<td>23.1</td>
<td>20.4</td>
</tr>
<tr>
<td>S. aureus</td>
<td>22.6</td>
<td>23.1</td>
<td>23.8</td>
<td>22.6</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>21.9</td>
<td>22.0</td>
<td>22.2</td>
<td>23.6</td>
</tr>
<tr>
<td>K. pneumonia</td>
<td>24.4</td>
<td>23.1</td>
<td>19.4</td>
<td>22.5</td>
</tr>
<tr>
<td>P. mirabilis</td>
<td>21.3</td>
<td>25.6</td>
<td>22.3</td>
<td>22.5</td>
</tr>
<tr>
<td>S. pyogenes</td>
<td>22.0</td>
<td>22.8</td>
<td>22.6</td>
<td>21.4</td>
</tr>
</tbody>
</table>

P: Pefloxacin; O: ofloxacin; S: sparfloxacin; C: ciprofloxacin.

DISCUSSION

The six species isolated in this study are very common clinical isolates implicated in various clinical diagnoses. In virtually all these isolates, resistance to the first line drugs have been reported in different research works, which may have prompted the use of fluoroquinolones in empirical treatments. Many research works have been published in relations to resistance in these bacteria against the fluoroquinolones both from in-patients and out-patients. The most commonly prescribed of the fluoroquinolones is ciprofloxacin. Resistance to this drug was discovered in the mid-1990s, and it increased slowly from 1.2% in 1998 to 2.5% in 2001 (Kalowsky et al., 2002). The North American Urinary Tract Infection Collaborative Alliance (NAUTICA) study revealed that ciprofloxacin resistance increased to 5.5% in 2004 (Zhanel et al., 2006). Uropathogens studied between the years 1996 and 2009 in the province of British Columbia demonstrated an increase in fluoroquinolone resistance. The resistance rates in E. coli and K. pneumoniae increased from <2% in 1996 to ≥20% in 2009; the resistance rates of fluoroquinolones for P. mirabilis
remained almost constant throughout the years at ≤2%. Enterococci demonstrated frequently resistance against fluoroquinolones although resistance rates decreased between 2002 and 2009 (AMR Report, 2009). The Antimicrobial Resistance Epidemiological Survey on Cystitis (ARESC) study revealed that in uropathogens collected in nine European countries and Brazil from 2003 to 2006 ciprofloxacin resistance in E. coli was recorded in >10% of all the isolates in Brazil, Spain, Italy, and Russia; in the remaining European countries, ciprofloxacin resistance ranged from 1.4% in France to 6.7% in Poland (Naber et al., 2008; Schito et al., 2009; Neuzillet et al., 2012). Though extended spectrum beta-lactamase production was not verified in our isolates, it has been however reported that increase to fluoroquinolone resistance is aided by its production (Azap et al., 2010). Increasing fluoroquinolone resistance in pneumococci paralleled increased usage of fluoroquinolones in general or 2nd generation quinolones in particular (Chen et al., 1999; Waites and Brown, 2003; Bhavnani et al., 2005; Pletz et al., 2011). Occasionally, fluoroquinolone resistance resulted in clinical failures in patients with pneumococcal pneumonia having been previously treated empirically with oral fluoroquinolones (Ho et al., 1999; Urban et al., 2001; Davidson et al., 2002; Pottumarthy et al., 2005; Fuller and Low, 2005). In total, there were 20 ciprofloxacin and levofloxacin treatment failures reported till January 2005 and reviewed by Fuller and Low (2005). Susceptibility testing of P. aeruginosa isolates from cystic fibrosis (CF) patients revealed that ciprofloxacin resistance in Europe ranged from 13.7% in Bulgaria (Strateva et al., 2009) to approximately 30% in the UK, Spain, Germany, and Italy (Schulin, 2002; Pitt et al., 2003; Morosini et al., 2005; Manno et al., 2005); 37.4% of the US isolates were ciprofloxacin-resistant (Burns et al., 2000). One of the most important features of bacterial resistance to fluoroquinolones is the ability to accumulate several mutations, affecting both DNA gyrase and bacterial permeability and resulting in strains associated with very high MICs (e.g. MICs of ciprofloxacin of 32 to 1,024 sg/ml). Such strains have been observed among isolates of S. aureus, Enterobacteriaceae species, and P. aeruginosa (Truong et al., 1995; Lehn et al., 1996). Widely varying percentages of resistance to fluoroquinolones have been associated with particular bacterial species, clinical settings, origin of strains, geographic locations, and local antibiotic policies (Acar and Goldstein, 1997). The continued increase in fluoroquinolone resistance rates affects patient management and necessitates a change in some current guidelines for the treatment of, for example, urinary tract infections (Peterson, 2004; Han et al., 2010; Wagenlehner et al., 2011).

Conclusion

Although all fluoroquinolones used in this study showed potency against the clinical isolates for the period of study, this does not negate the need for periodic monitoring of the efficacy of these drugs, as well as strict compliance to drug usage policies.

ACKNOWLEDGEMENT

The authors wish to thank the staff of the Babcock University Medical Centre’s laboratory for making available the clinical samples used in this study.
REFERENCES


DNA gyrase of *Escherichia coli* conferring resistance to quinolones [abstract no. C61]. In: Program and abstracts of the 35th Interscience Conference on Antimicrobial Agents and Chemotherapy.


UPCOMING CONFERENCES

7th European Summit for Clinical Nanomedicine and Targeted Medicine, Basel, Switzerland

American Association for Clinical Chemistry (AACC) Annual Meeting and Clinical Lab Expo, Chicago, USA
Conferences and Advert

**July 2014**
17th World Congress of Basic and Clinical Pharmacology, Cape Town, South Africa

**August 2014**
International Clinical Cardiovascular Genetics Conference, Brisbane, Australia

**September 2014**
3rd International Conference on Clinical & Cellular Immunology, Baltimore,
3rd International Conference on Clinical Microbiology & Microbial Genomics (Clinical Microbiology-2014), Valencia, Spain