

## Efficacy of pefloxacin in the treatment of postoperative sepsis in gynaecology

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### Summary

Twenty four women with postoperative sepsis following gynaecological surgery were recruited into a study designed to determine the efficacy of Pefloxacin. With the standard oral dose of Pefloxacin, clinical cure or improvement occurred in 98% of the patients. *In-vitro*, 90% of bacterial isolates were sensitive to Pefloxacin. No adverse effect was encountered in any of the patients. We concluded that Pefloxacin is effective in the treatment of postoperative bacterial infections following gynaecological surgery.

**Keywords:** Efficacy, pefloxacin, postoperative, sepsis, gynaecology.

### Résumé

Vingt quatre femmes avaient été recrutées pour l'étude afin de déterminer l'efficacité de la Pefloxacin après une opération gynécologique contaminée. Avec la dose orale standard de pefloxacin, une amélioration du traitement curatif à 98% avait été obtenue chez les patientes. 90% de bactéries isolées *in vitro* étaient sensibles au pefloxacin. Les effets indésirables n'avaient été rencontrés chez aucune patiente. Nous avons conclu que la pefloxacin est efficace dans le traitement des infections postopératoires après une opération gynécologique.

### Introduction

Post-operative sepsis in gynaecological practice often involves multiple bacterial organisms. Usually, these are combinations of both gram positive and gram negative organisms, the treatment of which mostly requires multiple antimicrobials or single expensive third generation ones which are administrable only parenterally. The fluoroquinolones (e.g., Pefloxacin, Ciprofloxacin and Ofloxacin) are new systemic quinolones which have almost totally replaced penicillins, tetracyclines and cotrimoxazole or have proved equally as efficacious as the cephalosporins and aminoglycosides in the treatment of severe bacterial infection [1-3]. Their cost and availability as oral preparations almost certainly ensures that they are useful antimicrobials. Pefloxacin is one of the quinolones now available in Nigeria. It appears to be effective against the majority of bacteria strains, notably *Pseudomonas aeruginosa* and *Klebsiella* species [4-6]. Studies have shown its efficacy in the treatment of bacterial infections in small doses [7,8]. The advantage of Pefloxacin will be its availability as oral effective antimicrobial in most gynaecological sepsis. Thus, it is necessary to elucidate the efficacy of pefloxacin in our clinical practice and evaluate this advantage. This forms the basis of our study designed to determine the efficacy of pefloxacin in patients who develop postoperative sepsis following gynaecological surgery.

### Patients and methods

The patients used in this study are those who developed sepsis following gynaecological surgery. The women were recruited if they developed one or more of fever (temperature > 38 °C occurring three or more days postoperation, wound swelling or discharge, cellulitis,

offensive vaginal discharge, low abdominal pain with collection and urinary tract infection. They had sepsis work up which included haematocrit, differential white cell count, blood film for malaria parasites and microscopy culture and sensitivity of vagina and endocervical swabs sputum, abdominopelvic drains, mid-stream or catheter specimen of urine, and blood. These tests were performed before initiation of treatment, 5-9 days afterwards and 21-28 days after stopping treatment.

Women less than 18 years old or with known hypersensitivity to quinolones (such as nalidixic acid) and pregnant women were excluded from the study. Those recruited were commenced on 400 mg. Pefloxacin (Peflotab) twice daily as soon as the initial samples were taken, and clinically evaluated daily. The mean duration of treatment was 5.4 ± 0.5 days (range 2-10 days). Ethical consideration prevented the use of placebo controlled study or the non-administration of antibiotics to infected patients as controls.

Clinical cure was assumed when clinical abnormalities subsided with no evidence of infection when the drug was discontinued and at follow up 6 weeks' later. Patients were considered improved when clinical abnormalities subsided but with incomplete resolution of infection. Relapse was defined as improvement during therapy with appearance of an infection at the same site and isolation of the same organism during periods of follow up. Failure was defined as no bacteriological response to therapy with clinical deterioration or death from infection.

### Results

Eighty-one major operations were performed at Our Lady of Apostle Catholic Hospital, Oluyoro, Oke-Offa, Ibadan, Nigeria between 1<sup>st</sup> May 1997 and 1 November 1997. These were 48 emergencies and 33 elective cases. The type of operations and numbers were as shown on Table 1. Laparotomy for ectopic pregnancies constituted the largest number of operations performed. Colpotomy or laparotomy was performed in 11 patients for pelvic abscess usually following clandestine termination of unwanted pregnancies. Twenty-four women developed post-operative sepsis.

**Table 1:** Number of septic cases among the various gynaecological operation performed.

Operations	Total no. of case	No. of septic case (%)
Abdominal hysterectomy	14	3 (21)
Vaginal hysterectomy	7	4 (57)
Myomectomy	8	3 (39)
Ovarian cystectomy	6	2 (33)
Ectopic pregnancy	30	6 (20)
Colpotomy/ laparotomy	12	6 (50)
Tubal surgery	4	0 (0)
<b>Total</b>	<b>81</b>	<b>24 (30)</b>

Their mean age was  $31.2 \pm 11.6$  years (range 18 – 78 years). Of the specimens collected, 9 high vaginal swabs, 6 endocervical swabs, 2 sputum, 4 abdominopelvic drains, 8 wound swabs, 10 mid-stream urine and 6 catheter specimens of urine yielded positive bacterial growths. More than one source of infection was present in 10 patients. Urinary tract infection was the commonest septic complication seen. *Staph aureus* was the commonest isolate while *Proteus vulgaris* was the least. Other isolates were as shown in Table 2. Anaerobes could not be cultured due to lack of materials. Pefloxacin had more than 90% sensitivity in all isolates.

**Table 2:** *In-vitro* bacteria sensitivity to Pefloxacin in 24 patients with postoperative sepsis in gynaecology.

Isolates	Percentage sensitivity to Pefloxacin
<i>Staph. aureus.</i> (12)	92
<i>Strept. spp.</i> (4)	100
<i>Klebsiella spp.</i> (7)	100
<i>Esch. coli.</i> (5)	100
<i>Pseudomonas spp.</i> (3)	100
Other coliforms (4)	100

Clinical cure or improvement with Pefloxacin was encountered in all patients except one who died of pulmonary embolism following clandestine termination of an unwanted pregnancy on the 2<sup>nd</sup> day of treatment (Table 3)

**Table 3:** Clinical outcome of Pefloxacin therapy

Diagnosis	Clinical outcome of treatment No. of patients (%)			
	Total	Cured	Improved	Failed
Urinary tract				
Infection	16	15 (94)	1 (6)	0
Pelvic				
Infection	15	13 (88)	1 (6)	1 (6)
Wound				
Infection	8	6 (75)	2 (25)	0
Pneumonitis	2	2 (100)	0	0
Cellulitis	2	2 (100)	0	0
Phlebitis	4	4 (100)	0	0
<b>Total</b>	<b>47</b>	<b>42 (89)</b>	<b>4 (9)</b>	<b>1 (2)</b>

#### Discussion

Sepsis continues to be an important complication of gynaecological surgery. Apart from the accompanying discomfort, sepsis results in prolonged hospital admissions and therefore increase in overall hospital bills to the patient. Hospital acquired bacterial infections show a remarkable difference to community infections in their susceptibility to antimicrobial agents, which changes frequently [9,10]. The Gram-negative bacteria are responsible for 69% of all bacteria infections at the University College Hospital, Ibadan and most of the strains are resistant to the commonly used antibiotics [10]. Majority of the effective antibiotics like cephalosporins and aminoglycosides are expensive and administerable only parenterally. Pefloxacin has been developed for both oral and parental use in the treatment of both Gram positive and Gram negative infection [4-6].

It has a broad spectrum activity and improved pharmacokinetic characteristics compared with those of nalidixic acid. The absorption and distribution of Pefloxacin is very rapid although its serum protein binding is low [4-6]. It has been shown to penetrate tissues in the female genital tract in adequate concentration for therapeutic use [4-6]. This high tissue penetration ratio and the slow elimination of Pefloxacin from tissues enhance its antimicrobial activities at tissue level where it is most required.

The present study demonstrates the clinical efficacy of pefloxacin in various postoperative infections in gynaecology, especially in those due to Gram-negative bacteria. This high clinical response with Pefloxacin compares favourably with previous studies using beta lactam stable agents or new cephalosporins [11-13]. No adverse effect was seen with the use of oral Pefloxacin in this series, but care should be taken with patients who are hypersensitive to other quinolones, growing adolescents and pregnant women. Emergence of resistance noted in an isolate of *Staph aureus* cultured from catheter is a cause for concern. Therefore, bacteria sensitivity tests should be performed before treatment. Our cure rate with a relatively low dose of Pefloxacin suggests that the quinolone increases the susceptibility of bacteria to host defence mechanism in the presence of sub-inhibiting concentration of the antibiotic by potentiating polymorphonuclear leucocytes function just like ciprofloxacin [13].

In conclusion, Pefloxacin proved to be effective for the treatment of gynaecological postoperative bacteria infections. The high bacteria susceptibility suggests that it can be used as a single agent against Gram-negative and Gram-positive bacteria. Since studies will be required to determine fully its clinical usefulness in anaerobic infection, it is at the moment advisable to combine the drug with metronidazole where such organisms are suspected.

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