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Fluoroquinolones in urinary tract infections: A study on perception analysis of prescribers

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ABSTRACT

To study the perception analysis of prescribers for various aspects related to use of fluoroquinolone antibacterials in patients with urinary tract infections. Present survey was carried out to understand the insights for satisfaction level, preferential prescription and in the context of efficacy, cost, resistance and adverse effects. A survey was done in the month of June (2010) with the help of close ended structured questionnaire. The primary data was collected by convenience sampling method and after collecting data, interpretation using statistical tools was made. Out of seventy prescribers surveyed, it was observed that majority of doctors were prescribing fluoroquinolone antibiotics in the treatment of urinary tract infections. The preferential prescribing behaviour can be attributed to better spectrum of activity and prescribers are generally satisfied with its efficacy in spite of few of adverse effects. From the survey, it can be concluded that the prescribers are optimistic about the use of fluoroquinolone antibacterials. These drugs are prescribed frequently for the treatment of urinary tract infections. However, incidences of some adverse effects during fluoroquinolone therapy and development of resistance are general challenges perceived. Hence, the pharmaceutical companies can work over these pitfalls of fluoroquinolone antibiotics to improve their perception in view of prescribers leading to increased prescription base.

INTRODUCTION

The term ‘infection’ is used to refer the presence and multiplication of microorganisms in the body and with the advent of antimicrobial drugs, it was predicted that microbial infection would cease to be a major problem. Anticipations from clinical experience and the scientific literature; however, indicate that microbial infection continues to be one of the major threats to life and health. Microbial infection commonly encountered in the community, as well as in hospitals in

the pre-antimicrobial period, was mainly of Gram positive etiology [1,2]. The treatment of infectious diseases still remains an important and challenging problem because of a combination of factors including development of resistance to current antibacterial therapy [3,4]. Infections of the urinary tract represent a wide variety of syndromes, including, urethritis, cystitis, prostatitis and pyelonephritis. Urinary tract infections (UTIs) are one of the most commonly occurring bacterial infections and account for around 8 million patient visits annually [5-7]. UTIs are usually caused by *Escherichia coli* or other species of the Enterobacteriaceace such as *Proteus*, *Klebsiella*, *Enterobacter* and Gram positive cocci such as *Enterococci* and *Staphylococci*, especially *Staphylococcus saprophyticus*. UTIs are among the most prevalent infectious diseases and their financial burden on society is substantial. These account for more than 100,000 hospital admissions annually, most often for pyelonephritis and they also comprise over one-third of all hospital-acquired infections [8-10].

Antiinfective chemotherapy is the science of administering chemical agents to treat infectious diseases. This practice has proven to be one of the most successful of all pharmaceutical studies. Historically, the use of antiinfective agents can be credited with saving more human lives than any other area of medical therapy discovered to date [11]. Emperic antiinfective therapy is usually given to reduce the incidence of postoperative UTI to prevent development of sepsis, to reduce duration of hospital stay and thus leading to reduction in cost of patient care [12]. During the past twenty five years, antimicrobial agents have been introduced as a rate exceeding our ability to integrate them into clinical practice. Since their introduction, fluoroquinolones have become a mainstay in the treatment of bacterial infections [13-15]. In treatment strategies of UTIs antibiotic agent is generally chosen that includes most of the uropathogens in its antibacterial spectrum. In this regard, the fluoroquinolones are currently considered to be amongst the drugs of choice [16].

Moreover, fluoroquinolones are broad spectrum antibiotics widely used for the treatment of numerous diseases [17]. These are entirely synthetic antimicrobials having a quinolone structure that are active primarily against Gram negative bacteria; though, newer fluorinated compounds also inhibit Gram positive ones. These drug acts by inhibiting bacterial DNA synthesis [11,13,15,18].

Quinolones are the fastest growing antibacterial class globally because being due to used both in the hospitals and community sectors to treat infections. Fluoroquinolone sales are expected to remain relatively constant upto 2011. Growth during this period is anticipated driven by increased use of quinolones in the treatment of less severe respiratory tract infections in the community sector [19]. The market is heavily dominated by ciprofloxacin and levofloxacin, which together command 65% ($3.3 billion) of global sales. Ciprofloxacin, levofloxacin, moxifloxacin is a listing of quinolones that have been excellent representatives of market capacity and sales volume. Currently, China, India, Germany, Japan and United States are the world's production and sales counters globally. Indian production of fluoroquinolones has a certain scale in the international production and occupy 30% share [20].

Pharmaceutical marketing is an indirect approach and the prescribers play a vital role for both pharmaceutical companies and patients, as every patient is dependent on the type of drug prescribed by them and the turnover of any company also depends on prescribing practices of prescribers. Hence, the purpose of present investigation is to analyse the perception of prescribers for fluoroquinolone antibiotics in patients with UTIs. The study also tries to bring out the benefits and pitfalls of such perceptions and their possible effects on marketing and sales of the

drug products. By knowing the perception of prescribers for these antibacterials, the pharmaceutical industry can change their research and marketing strategies for these antibiotics. For analysing perception about fluoroquinolone antibacterials, present survey was carried out employing a structured questionnaire.

MATERIALS AND METHODS

Research Design

A research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data.

Method of Data Collection

Primary data collection

The survey was undertaken on the lines of interaction with doctors i.e. the information was collected from the respondents with the help of a *Structured Questionnaire***.**

Sampling Technique

A sampling technique is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure, the researcher would adopt in selecting item for sample i.e. the size of sample. *Convenience sampling method* has been adopted to carry out the present research work.

Questionnaire

The questionnaire prepared was a structured questionnaire with appropriate questions. It was designed in such a way so as to extract all the necessary information from the respondents that fulfil the needs of the main and sub objectives.

Sample size and Sample area

In the present survey, seventy doctors were surveyed for analysis of perception for fluoroquinolone antibiotics in case of urinary tract infections. Data was collected from Hisar and Fatehabad district of Haryana**.**

RESULTS AND DISCUSSION

Each prescriber of sample population was surveyed personally for collecting primary data so as to analyse his/her perception. When prescribers were asked regarding how often they are prescribing fluoroquinolone antibiotics in UTIs, then it was observed that 54% doctors were prescribing these antibiotic always in daily practice, 26% prescribed them often, 17% were in the favour that they sometimes prescribe these drugs and 3% prescribe them rarely in daily practice. Figure 1 below shows perception about prescription of fluoroquinolones.

For knowing reasons of preference about these antibiotics, the prescribers were asked another question that why they prefer fluoroquinolone antibiotics in urinary tract infections. From survey, it was analysed that vast majority of doctors (83%) preferred these drugs due to better spectrum of activity; however, only 9% and 7% prescribers were in the favour that reason for preference of these drugs are safety and reliablity respectively and very less (1%) were preferring these drugs as they can be prescribed to any age group. Figure 2 shows reasons for preferential use of fluoroquinolones.

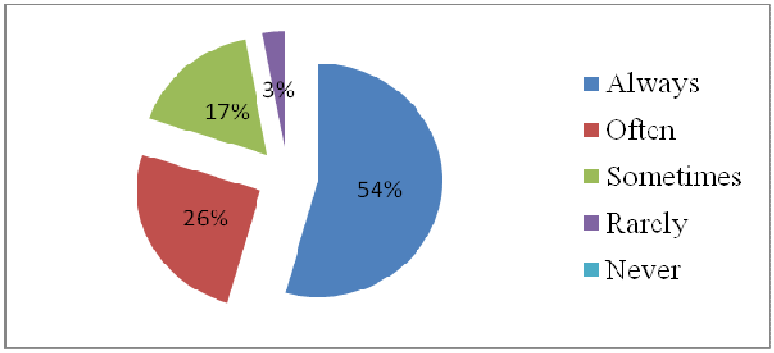

Figure 1. Prescribing Practice of FQs in UTIs

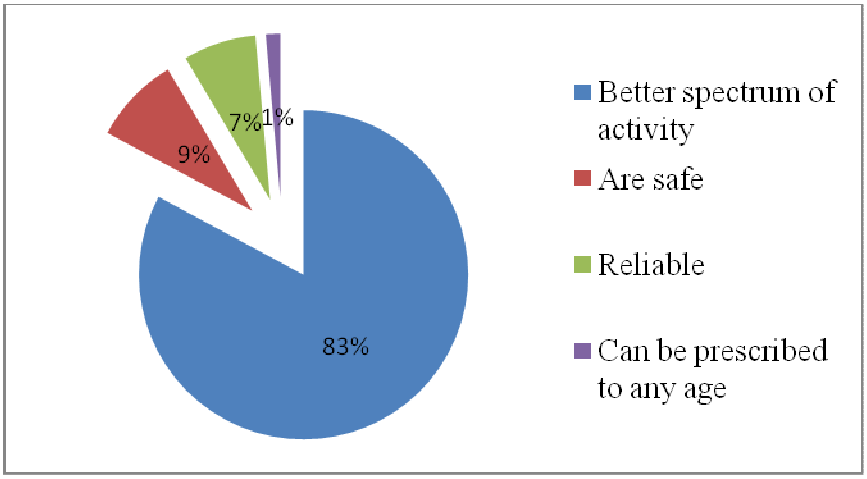

Figure 2. Reason for preference (Percent)

Further question of the study was related to the satisfaction level of doctors in relation to efficacy of these antibiotics. It is observed that 26% prescribers were highly satisfied from efficacy of fluoroquinolone antibiotics, more than half (69%) were satisfied, 4% prescribers were neutral and only 1% were dissatisfied from the efficacy of fluoroquinolones. Figure 3 represents the satisfaction level of doctors.

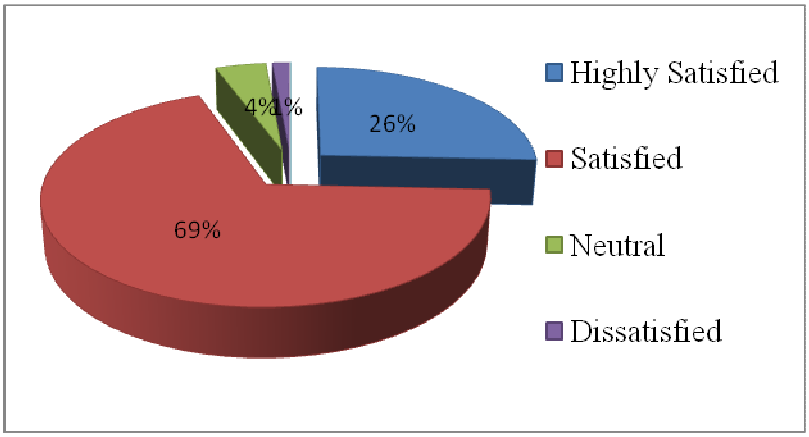

Figure 3. Satisfaction level

All drugs depict pharmacological effects alongwith some adverse effects. Hence, for knowing opinion about adverse effects of fluoroquinolones, the next question was designed accordingly. From collected data, which is presented in Figure 4, it can be observed that 23% prescribers had noted adverse effect in patients, 57% noted adverse effect sometimes and 20% prescribers were there who did not reported any adverse effect in patient while using fluoroquinolone antibiotics. Some of the adverse effects noted by prescribers include skin rashes, prolongation of QT interval in ECG, nausea, vomiting, gastric disturbances, dizziness, bone and joint damage, anorexia, insomnia and visual disturbance in older patient. Since only mild instances were experienced, these drugs are perceived safe in general.

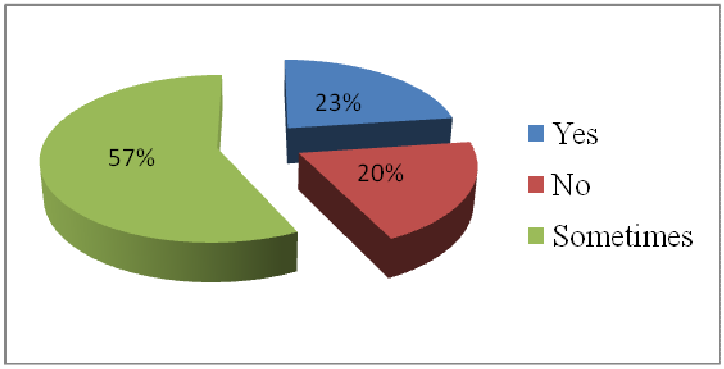

Figure 4. Adverse effect opinion (Percent)

Customers play a key role in enhancing the sale of particular drugs, and hence, the next question was in relation to opinion about cost of these antibiotics. From survey of prescribers, it is concluded that 74% prescribers were in the favour that these antibiotics are not costly for patients, 3% were there who say that these are costly and 23% were there who were not bothered about the cost of fluoroquinolones. The data of perception about cost is illustrated in Figure 5.

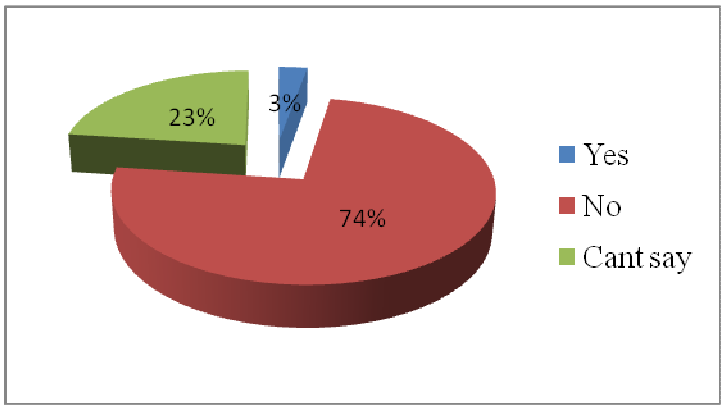

Figure 5. Cost Perception (Percent)

Resistance is one of the important aspects to be studied because generally resistance is developed against antibacterials. So, opinion about resistance of these antibiotics was analysed by asking yet another question. From survey, it has been interpreted that maximum prescribers (67%) were in favour that resistance has been developed against fluoroquinolone antibiotics and 33% prescribers were against this opinion and believe that resistance is not developed against these antibiotics. The data about opinion of prescribers regarding resistance is depicted in Figure 6.

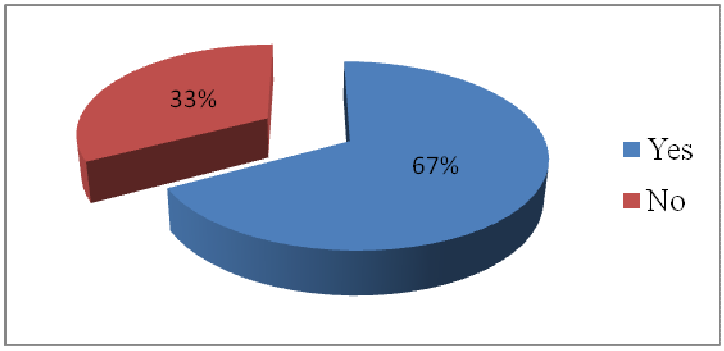

Figure 6. Perception about Resistance (Percent)

From above findings and observations, it is analysed that maximum doctors out of seventy were prescribing fluoroquinolone antibiotics in the treatment of UTIs in spite of development of resistance and occurrence of adverse effects in some cases.

CONCLUSION AND PROSPECTS

The present study is aimed at analysing the perception of prescribers for fluoroquinolone antibiotics in patients with UTIs. From the survey, it can be concluded that fluoroquinolone antibiotics are prescribed frequently for the treatment of UTIs. FQs may show some adverse effects during therapy which is observed by prescribers and resistance is also developed against some drugs of fluoroquinolone. In spite of resistance and mild adverse effects, these antibiotics are commonly prescribed due to their better spectrum of activity, affordability and improved compliance of the patients. In addition, majority of doctors were also satisfied with the efficacy of these antibacterials. Moreover, in the emerging scenario, various pharmaceutical companies involved in research and marketing of these fluoroquinolone antibacterials will have to develop advanced scientific and management strategies leading to reduced incidences of adverse effects along with development of resistance and thus ensuring better quality of life for the patients. So by and large it is analysed from survey that fluoroquinolones antibacterials have positive perception among prescribers and hence these are prescribed frequently in UTIs. Also, If companies work over pitfalls of these antibiotics, it will definitely improve the market share as well as perception for these drugs.

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REFERENCES

[1] Mombelli A, *Oral Dis.*, **2003,** 9, 6-10.
[2] Stanley MM, *Am. J. Med.*, 2, **1947**, 253.
[3] Kharab R, Sharma PC, Yar MS, P, *J. Enz. Inhib. Med. Chem.*, **2010**, 1-21. Published Early online DOI 10.3109/14756360903524304.
[4] Chawla R, Sahoo U, Arora A, Sharma PC, Vijayaraj R, *Acta Pol. Pharm. Drug Res.*, **2010**, 67(1), 55-61.
[5] Warren JW, Abrutyn E, Hebel JR et al. *Clin. Infect. Dis.*, **1999**, 29, 745-758.

[6] Fihn SD, *N. Engl. J. Med.*, **2003**, 349, 259-266.
[7] Bacheller CD, Bernstein JM, *Med. Clin. North Am.*, **1997**, 81,719-729.
[8] Wagenlehner FME, Niemetz A, Naber KG, *Int. J. Antimicrob. Agents*, **2002**, 19, 557-564.
[9] Foxman B, *Am. J. Med.*, **2002**, 113, 5S-13S.
[10] Gales AC, Jones RN, Gorden KA, Sader HS, Wilke WW, Beach ML, Pfaller MA, Doern GV, *et al. Antimicrob. Chemother.*, **2000**, 45, 295-303.
[11] Sharma PC, Jain A, Jain S, *Acta Pol. Pharm. Drug Res.*, **2009**, 66, 587-604.
[12] Larsen EH, Gasser TC, Madsen PO, *Urol. Clin. North Am.*, **1986**, 13, 591-604.
[13] Sharma PC, Jain A, Jain S, Pahwa R, Yar MS, *J. Enz. Inhib. Med. Chem.*, **2010**, 25(4), 577-589.
[14] Sharma PC, Saneja A, Jain S, *Int. J. Chem. Sci.* **2008**, 6(4), 1702-1713.
[15] Sharma PC, Jain A, Jain S, Therapeutic perspectives of fluoroquinolone antibacterials: An update, In: Proceedings of the 1st Rashtriya Yuva Vaigyanik Sammelan held at NIT Kurukshetra during 28-30 November, **2008**, 234-239.
[16] Lubasch A, Keller I, Borner K, Koeppe P, Lode H, *Antimicrob. Agents Chemother.*, **2000**, 44, 2600-2603.
[17] Chawla R, Arora A, Parameswaran MK, Sharma PC, Michael S, Ravi TK, *Acta Pol. Pharm. Drug Res.*, **2010**, 67(3), 247-253.
[18] Tripathi KD, Essentials of medical pharmacology, Edn 6th, Jaypee brothers medical publishers Ltd, New Delhi, **2008**, 687-693.
[19] Commercial perspectives: Fluoroquinolones - Established products drive market growth. Bharat book bureau. PR log-global press release distribution. **2007**, 1-3.
[20] In Recent Years, Bulk Drugs and Intermediates Ciprofloxacin Market Analysis. Available at http://www.articlesbase.com/non-profit-organizations-articles/in-recent-years-bulk-drugs-and-intermediates-ciprofloxacin-market-analysis-3498636.html. (Accessed on 1st September 2010).