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Research Article

Evaluation of Antibiotic Prescription Practices among General Surgeons in Nagpur

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Abstract: The prescribing habits of the individual doctor are quite stable, and changes usually occur slowly and as a result of various influences, including scientific papers, specialist recommendations, meetings, colleagues, patients, and drug companies. The In the present study we studied prescription practices among general surgeons in Nagpur. This prospective observational study was conducted in the department of general surgery at NKP Salve Institute of Medical Sciences & Lata Mangeshkar Hospital Nagpur. Various Surgeons in Nagpur were surveyed on antibiotic prescription practices in the treatment of Routine surgical conditions. A one page questionnaire was delivered to the surgeons via Emails & Handouts. Data was analysed using SPSS software version 15.0. The results of this study is Seventy seven percent of respondents selected Ceftriaxone as the first choice antibiotic in patients with Appendicitis followed by ceftriaxone plus metronidazole (11%) and ciprofloxacin plus metronidazole (11%). Ceftriaxone is the drug of choice in inguinal hernia, Hydrocele and phimosis. In benign breast disease choice of drug is ceftriaxone (91.6%) and cefotaxime (8.4%). In malignant breast disease choice of drug is ceftriaxone (44.4%), cefotaxime (44.4%) and cefoperazone (11.1%). In cholecystitis choice of drug is ceftriaxone plus sulbactum (88.8%) and cefoperazone plus sulbactum (11.1%). In benign anorectic conditions choice of drug is ceftriaxone (91.6%). In perforation peritonitis & Intestinal obstruction choice of drug is ceftriaxone plus metronidazole. In conclusion the result of our observational study is failure to apply evidence based guidelines to our clinical practice. This indirectly increases the costs as well as increases the chance of resistance to higher antibiotics.
Keywords: prescription practices, antibiotic, surgeons.

INTRODUCTION

Surgical site infection (SSI) is the most common post operative complication and represents a significant burden in terms of patient morbidity and mortality, and cost to health services around the world. SSIs are also the second commonest nosocomial infection [1, 2]. It has been estimated that 2-5% of patients undergoing clean extra abdominal surgeries and up to 20% of patients undergoing intra abdominal procedures will develop a SSI [3-8].

Appropriate antibiotic prophylaxis has been shown to be effective in reducing the incidence of surgical site infections. Selection of an appropriate antimicrobial agent depends on the pathogen most likely to cause an infection. A single pre operative antibiotic dose is sufficient for operations lasting up to 4 [9]. In prolonged surgeries, however, further antibiotic doses may be needed to maintain the drug levels. Re-administration should also be considered in the event of prolonged or excessive intraoperative bleeding. Timing of antibiotic prophylaxis is considered optimal if administered within 30 minutes prior to incision [10].

Some data suggest that nearly 30-50% of antibiotics used in hospitals are prescribed for surgical prophylaxis and 30-90% of this prophylaxis is inappropriate. Antimicrobial agents are overprescribed, given at a wrong time or continued for a long duration [11]. Inappropriate use of antibiotics is associated with unnecessary increase in the cost of therapy and in the emergence of drug resistant bacteria [12].

Good prescribing habits imply the use of a limited number of drugs of which the doctor has a good knowledge. The risk of inappropriate prescribing is higher among doctors who prescribe many different drugs. The prescribing habits of the individual doctor are quite stable, and changes usually occur slowly and as a result of various influences, including scientific papers, specialist recommendations, meetings, colleagues, patients, and drug companies. In the present

study we studied prescription practices among general surgeons in Nagpur.

MATERIAL & METHODS

This prospective observational study was conducted in the department of general surgery at NKP Salve Institute of Medical Sciences & Lata Mangeshkar Hospital Nagpur. Various Surgeons in Nagpur was surveyed on antibiotic prescription practices in the treatment of Routine surgical conditions. A one page questionnaire was delivered to the surgeons via Emails & Handouts. Data was analysed using SPSS software version 15.0.

RESULTS

Forms were distributed to 85 consultants in the form of handouts and Emails. Only 36 of them responded. The demographic profile of the respondents is described in Table 1. All were male respondents accounted for 100 %. About 30% of the respondents were <36 years old and 54% more than 45 years old. The most frequent academic degree was Masters in General surgery (MS). Post MS experience was more than 20 years in 17 respondents and less than 20 years in 19 respondents with mean of 19.27. 44.4 % of the respondents were having attachment to teaching institute and 55.5 % of the respondents were attached to both teaching institute and private setup. Most of the respondent updates their knowledge by means of academic methods (88.8%) and 11.1 % of them by academic as well as pharmaceuticals.

Table-1: Demographic Profile of Participants

S.No	Characteristics		Number	Percentage
1	Sex	Male	36	100
		Female	0	0
2	Age	25-35	11	30.5
		36-45	5	13.8
		46-55	4	11.1
		56-65	16	44.44
3	Experience	1-10	12	33.3
		11-20	7	19.4
		21-30	1	2.7
		31-40	16	44.44
4	Setup	Teaching institute (a)	16	44.4
		Pvt setup (b)	0	0
		Both (a+b)	20	55.5
5	Source of updating knowledge	Academic methods (a)	32	88.8
		Pharmaceuticals (b)	0	0
		Both (a+b)	4	11.1

Antibiotic preference by the respondents is described in table 2. In appendicitis, Ceftriaxone is the choice of antibiotic (77 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 3 days and then shift to oral antibiotics (Cefixime) for 5 days. In inguinal hernia, ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 3 days and then shift to oral antibiotics (Cefixime) for 5 days. Only 2 respondents prefer 1 dose of prophylactic antibiotic and no post operative antibiotics in a case of inguinal hernia. In Hydrocele, Ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 3 days and then shift to oral antibiotics (Cefixime) for 5 days.

In Phimosis, Ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 1 day and then shift to oral antibiotics (Cefixime) for 5 days. In malignant breast disease 44 % of the respondents use ceftriaxone and equal of them use cefotaxime as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 5 days and then shift to oral antibiotics (Cefixime) for 5 days. In Benign breast disease, Ceftriaxone is the choice of antibiotic (91 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 1 day and then shift to oral antibiotics (Cefixime) for 5 days. In cholecystectomy, Ceftriaxone plus sulbactam is the choice of antibiotic (88 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 5 day and then shift to oral antibiotics (Cefixime) for 5 days. 12 % of the respondents use cefoperazone plus sulbactam.

In benign anorectal condition, Ceftriaxone plus metronidazole is the choice of antibiotic (91 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 3 day and then shift to oral antibiotics (Cefixime) for 5 days. 9 % of the respondents uses amoxicillin plus clavulanic acid as

prophylactic as well as postoperative. In perforation peritonitis as well as intestinal obstruction all respondents uses Ceftriaxone plus metronidazole (100 %) as prophylactic as well as post operative. The average duration of Intravenous antibiotic is 5 day and then shift to oral antibiotics (Cefixime) for 5 days.

Table-2: Antibiotic preference by the respondents

S.No	Surgical condition	Choice of Antibiotic
1	Appendicitis	Ceftriaxone (77%)
2	Inguinal hernia	Ceftriaxone (86%)
3	Hydrocele	Ceftriaxone (86%)
4	Phimosis	Ceftriaxone (86%)
5	Malignant breast disease	Ceftriaxone (44%), Cefotaxime (44%)
6	Benign breast disease	Ceftriaxone (91%)
7	Cholecystectomy	Ceftriaxone plus sulbactam (88%), Cefoperazone plus sulbactam (12%)
8	Benign anorectal disease	Ceftriaxone (91%)
9	Perforation peritonitis	Ceftriaxone plus metronidazole (100%)
10	Intestinal obstruction	Ceftriaxone plus metronidazole (100%)

DISCUSSION

Appropriateness of preoperative antibiotic prophylaxis was assessed as per guidelines of Scottish Intercollegiate guideline Network (SIGN) and American Society of Health-system Pharmacists (ASHP) [13, 14]. These guidelines provide evidence based recommendations to the practitioners for rational use of prophylactic antimicrobials.

In our study, Ceftriaxone is the choice of antibiotic (77 %) as prophylactic as well as post operative in appendicitis which is inappropriate according to guidelines. Cefoxitin, cefotetan, cefazolin + metronidazole are the recommended agents by the guidelines. In inguinal hernia, ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative which again is inappropriate according to guidelines. Cefazolin is the recommended agents. In Hydrocele, Ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative whereas cefazolin is the recommended agent of choice.

In Phimosis, Ceftriaxone is the choice of antibiotic (86 %) as prophylactic as well as post operative whereas cefazolin is the recommended agent of choice. In malignant breast disease 44 % of the respondents use ceftriaxone and equal of them use cefotaxime as prophylactic as well as post operative. In Benign breast disease, Ceftriaxone is the choice of antibiotic (91 %) as prophylactic as well as post operative which is again inappropriate according to guidelines. Cefazolin is the recommended agent of choice. In cholecystectomy, Ceftriaxone plus sulbactam is the choice of antibiotic (88 %) as prophylactic as well as post operative. 12 % of the respondents use cefoperazone plus sulbactam. According to guidelines, Cefazolin, cefoxitin and cefotetan are recommended agents and ceftriaxone use should be limited to patients requiring antimicrobial treatment for acute cholecystitis or acute biliary tract infections which may not be determined prior to incision, not patients undergoing cholecystectomy for non infected biliary conditions, including biliary colic or dyskinesia without infection.

In benign anorectal condition, Ceftriaxone plus metronidazole is the choice of antibiotic (91 %) as prophylactic as well as post operative. 9 % of the respondents uses amoxicillin plus clavulanic acid as prophylactic as well as postoperative. Cefazolin + metronidazole, cefoxitin, cefotetan are the recommended agents. Due to increasing resistance of Escherichia coli to fluoro quinolones and ampicillin–sulbactam, local population susceptibility profiles should be reviewed prior to use. According to guidelines, where there is increasing resistance to first- and second-generation cephalosporins among gram-negative isolates from SSIs, a single dose of ceftriaxone plus metronidazole may be preferred over the routine use of carbapenems.

In perforation peritonitis as well as intestinal obstruction all respondents uses Ceftriaxone plus metronidazole (100 %) as prophylactic as well as post operative. Recommended agent according to guideline is cefazolin in non obstructive small bowel disease and cefazolin plus metronidazole in obstructive small bowel disease.

In our study all the respondents prefer third generation cephalosporin as the drug of choice for prophylaxis in surgery, whereas according to ASHP guidelines, cefazolin is the drug of choice for prophylaxis and post operatively. For surgical prophylaxis it is important to select an antibiotic with narrowest antibacterial spectrum to reduce the emergence of resistance and also because broad spectrum antibiotics may be required later if patient develops serious sepsis. Therefore, it is recommended that the use of third generation cephalosporins such as ceftriaxone and cefotaxime be avoided in surgical prophylaxis [15].

The result of our observational study is failure to apply evidence based guidelines to our clinical practice. This indirectly increases the costs as well as increases the chance of resistance to higher antibiotics. The number of respondents in our study was small. This again suggests lack of participation from surgeons in studies like ours as well as fear of highlighting the use of inappropriate antibiotics in clinical practice.

Above results can be overcome by adherence to the evidence based guidelines, participation in various continue medical education programmes, conferences, reviewing the antibiotic protocols regularly in their setup and participation in various surveys for use of antibiotics.

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