



Prevalence of antimicrobial empirical therapy & its consequences in Health Care centre of Pakistan: A Cross Sectional Study

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ABSTRACT

Empirical therapy is the therapy based on experience and, more specifically, therapy begun on the basis of a clinical educated guess in the absence of complete or perfect information. Drugs used as empiric therapy usually have broad spectrum but once the pathogen of illness has been diagnosed the narrow spectrum antibiotic should be used which is effective against that particular type of pathogen. In this study we aimed to know about the most prevalent trend of empirical therapy in Pakistan by different physicians and their attitude towards treating the patient. For the purpose of this study different wards and OPDs were visited and relatively 100 of the prescriptions and case histories were observed to come to know about the different consequences in which the empirical therapy is used most commonly. Nearly only 39% of the physicians out of 100 % recommend culture sensitive testing to patients. Augmentin is the most commonly used empiric drug (26%) after that ciprofloxacin (15%) and erythromycin (8%) use commonly. Patients experience a varieties of side effects by the use of empiric drugs like sedation (38%), nausea (30%) etc. After careful consideration it was concluded that ancoherent practices prevalence have been raising dangerously which needs careful review by health authorities.

Key words: empirical therapy, its prevalence, antibiotics, resistance, CS test, prescribing pattern.

INTRODUCTION:

Antimicrobials agents are some of the most widely and often impulsive used therapeutic drugs planetary. The initial therapy of infections is mostly empiric [1]. Empiric therapy is mostly based on experience thus it is applied before the endorsement of a definitive diagnosis or in the absence of complete cognizance of pathogen [2]. The broad spectrum antibiotics used mostly as an empiric drug therapy the empiric use of broad spectrum antibiotic increases by selection the pervasiveness of bacteria resistant to several antibiotics [3]. The present study manifest a significant overuse of antibiotics and an inadequate deliberation of microbiological results [4]. Additionally the impact of microbiological results on the clinical management of patient should be improved [5].

Data suggest that the use of suitable empirical therapy may not be as critical to patient's upshot as other studies have recommended [6]. Identifying the time at which adequate therapy becomes critical to patient upshot is particularly important [7]. The elegant balance that exist between the adventitious effect of adequate therapy on patient survival & the

reinforcement of antimicrobials resistance due to immoderate use of broad spectrum antimicrobial agents [8]. The increasing presence of drug resistant bacterial infections among hospitalized patients has resulted in greater numbers of patients receiving inadequate antimicrobial treatment [9].

Antimicrobial therapy should be assessed based on clinical response and microbiological data as it becomes feasible [10]. We should proposed to minimize the excessive use of empiric antimicrobial drugs [11]. Although, the mount trend in aimless and inadequate prescription of antibiotics has been decried by academicians [12]. The health care professionalist should realize the harmful effects of empirical drugs on patients in order to achieve an ideal health care system [13]. He choice of empiric therapy has become increasingly difficult because of the increasing prevalence of antibiotic resistant bacteria [14]. Current diagnostic and treatment guidelines suggest that all seriously ill patients in whom infection is suspicious undergo an exhaustive work up e:g blood urine cultures etc [15]. The selection of the most adequate antimicrobials must consider the likely etiologies and predictable resistance patterns

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[16]. Initial empiric broad spectrum antibiotic therapy is essential for treatment of patients with serious infections following a thorough estimation of possible origin including culture sensitive testing [17]. The empirical use of antibiotics increases day by day and it require a great concern in order to maintain patient life safety and good health care system in a society. [18]

The objective of the study is to evaluate prescribing pattern of empirical antimicrobial therapy and its serious consequences in our society in view of the fact to evaluate physician’s knowledge, attitude and concern towards patients after frequently prescribing empirical therapy of antimicrobials.

METHODOLOGY

This study was conducted in Karachi from April 2015 to May 2015 based on descriptive studies of prescription reading and case histories collected from different healthcare settings especial emphasized on out patients and general wards. Patients suffer from any infection and taking medicines without CS testing are of great concern during studies. In order to evaluate the costs of being “clinically wrong” in treating patients with empiric antibiotics, we compared the outcomes in patients who received empiric therapy without confirmed infections and those who never received empiric therapy. Physicians whose 100 prescriptions were assessed in this study were from different Discipline of hospital, mostly from OPDs and general physicians for the collection of sample data. Prescriptions were carefully observed and studied especially prescription of OPDs patients because empirical therapy is very commonly used for out-patients. Almost 50 prescriptions collected from general ward and 50 from OPDs patient then prescription was carefully studied and observed the common prescribing antibiotics in different consequences and patient histories were also

carefully studied.it was also seen that 5% of the patients were resistant to that particular antibiotic which they were using from prolong duration of time.

RESULTS

The % ratio has been calculated by the survey between the peoples who aware about culture sensitive testing and those who don’t know about it the results shows that only 49% of peoples out of 100% knows about culture sensitive testing. The culture sensitive testing is very common worldwide but in Pakistan only 39% of doctors recommend patients for culture sensitive testing in very severe cases (Fig 10). In very rare cases doctor recommend patients to culture sensitive testing and the examples of some pathogens which may diagnose involved: S.pneumoniae (65%), influenza (29%), s.aureus (22%), anaerobes (7%) etc. (table 4). The side effects ratio was observed that 39% of peoples experience side effects which includes nausea (35%), diarrhea (25%), dizziness (20%), skin rash (10%), sedation (38%) and other (12%) the 61 % of peoples never experience any type of side effects. Many peoples takes antibiotic as a self-medication 30% of peoples used always self-medication and never visit to doctor 28% of peoples sometimes use self-medication and 26% of peoples never use self-medication. It was also seen that the most common infections in which empirical therapy used include: typhoid fever(5%), throat infection (30%), pneumonia(10%), skin infection (8%), ear infection (12%), urinary tract infection(20%) frequently in women’s of above 30 years, asthma(5%),other bacterial infections(10%). The duration of use of antibiotics by patients as empirical therapy is mostly 1 week (in 45% of cases), 1 month (in 15% of cases mostly in chronic infection) and 3 to 6 days (in 40% of cases).

Table-1 : Drugs Used Empirically for Different Infections

Infection/disease	antibiotics	duration
Joint pain	piroxicam	1 week
Sore throat	Erythromycin, amoxicillin	3 days
Chest infection	levofloxacin	1 week
pyrexia	Ciproflaxocin and levofloxacin	3 days
Skin infection	betnovate	2 – 3 days
Throat infection	Augmentin,calamox,levofloxacin	1 week
Urine infection	Varmox, Augmentin	1 month
Ear infection	Fluconazole, gentamycin	1 month
dermatitis	ciproflaxocin	1 week

Table 2: Antibiotics used in different consequences after proper diagnoses

Infection/disease	antibiotic	duration
1.G.I.T infection	Doxycycline . ciprofloxacin	1 month
2.tuberculosis	Mytrin-p forte	8 months
3.Urinary tract infection	doxycycline	15 days
4.dysentery	Nalidixic acid ciprofloxacin	1 month
5.enteritis	Erythromycin , ciprofloxacin	2 weeks
6.Whooping cough	erythromycin	1 week
7.asthma	Rentus , augmentin	1 month
8.ulcer	Omeprazole , misoprostol	2 weeks
9.meningitis	ceftriaxone, chloramphenicol	_
10.Osteomyelitis(bone and joint infection)	Cloxacillin , cefazolin	1 week to months
11.Respiratory infections	erythromycin	1 week
11.Ear infection	Gentamicin , fluconazole	1 month
12.Throat infection	Augmentin , ciprofloxacin	1 week
13.bronchitis	Doxacycline , amoxicillin	2 weeks
14.Skin infection	Sulfamethoxazole + trimethoprim	Several days

Statistical analysis: 100 prescriptions were carefully observed and studied out of 100 prescriptions 50 were collected from general ward and 50 prescriptions from OPDs patients. The ratio that how commonly physicians prescribing antibiotics without perfect diagnoses were observed and following statistics were concluded:

Table 3: Above antibiotics use in different consequences is as follows:

antibiotics	indications
Co-trimoxazole	Throat infection
ciprofloxacin	Bacterial infection
ampicillin	Bladder infection, pneumonia ,meningitis
Doxycycline	UTI and intestinal infection
gentamicin	Ear infection
erythromycin	Upper & lower respiratory tract infections
Oxacillin/ampicillin	Gonorrhea, pneumonia
Midecamycin	Bacterial infections of respiratory tract
Spiramycin	Severe infections
azithromycin	Typhoid, pneumonia , acute bacterial infections.

Figure 1 The ratio of different pathogens causing infections.

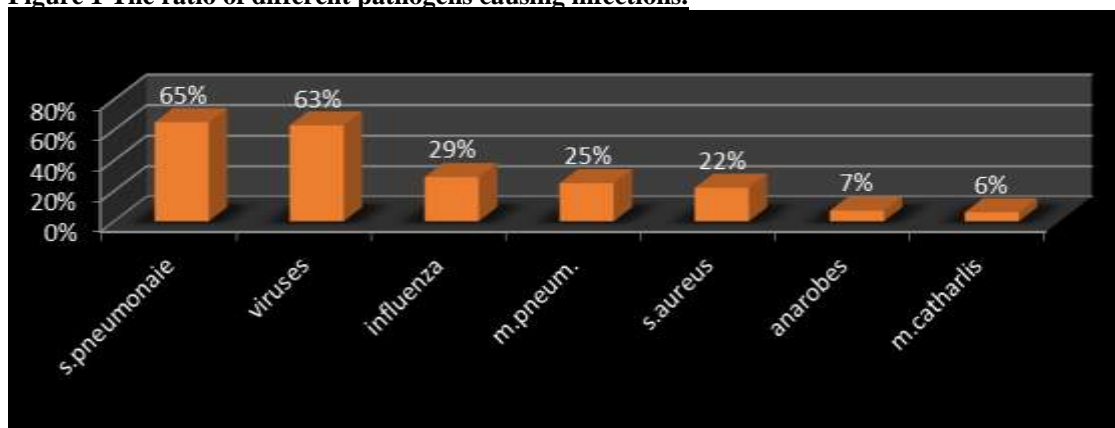
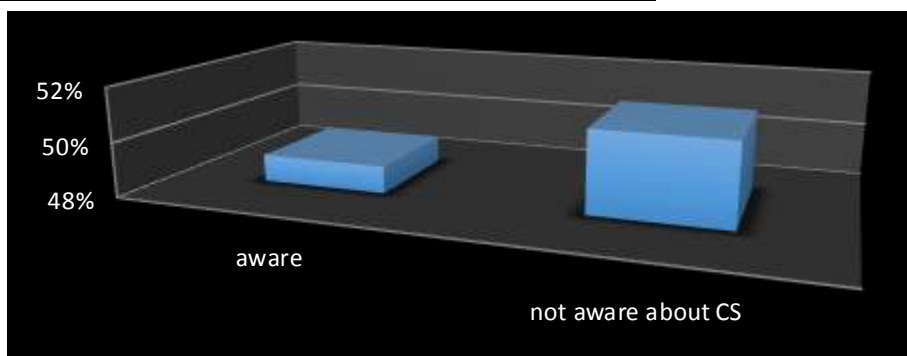
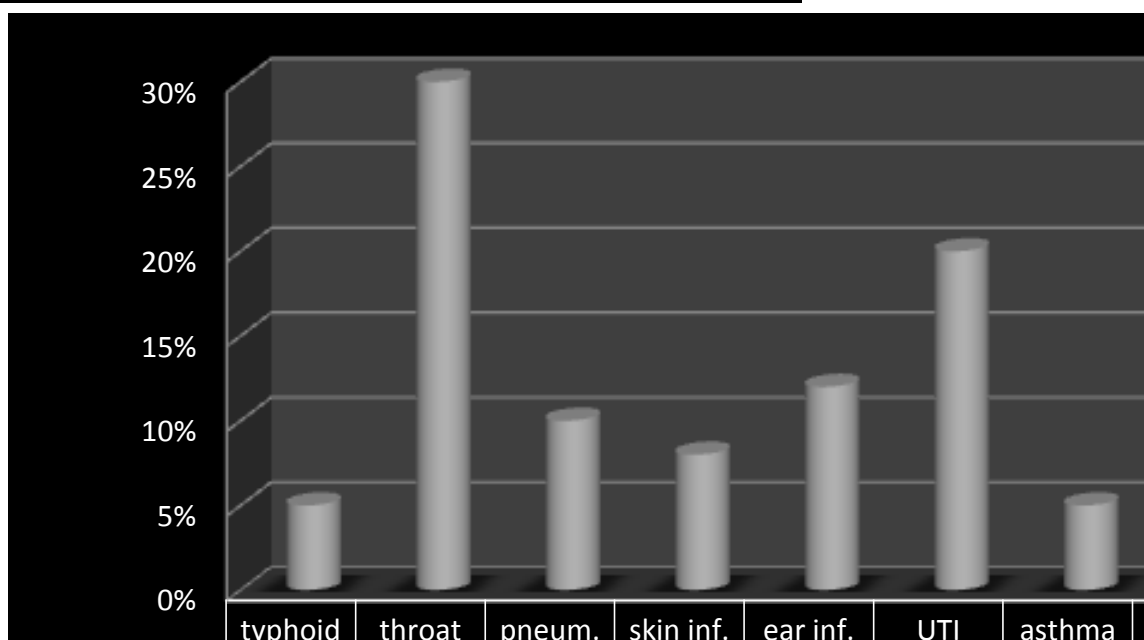


Figure 2 Percentage of Culture sensitivity Test Awareness



The statistics of different infectious diseases are as follows which shows that most commonly patients suffer from throat infections and amoxicillin antibiotic is mostly given as empiric therapy [figure 4]

Figure 4 frequently prescribe emperial therapy with respect to disease.



Augmentin, amoxicillin, erythromycin most commonly used as a self-medication .The statistics of peoples using antibiotics as a self-medication or those who never use antibiotic as self-medications is as follows: [figure 5]

Figure 5 Self medication habit of antimicrobial empirical therapy

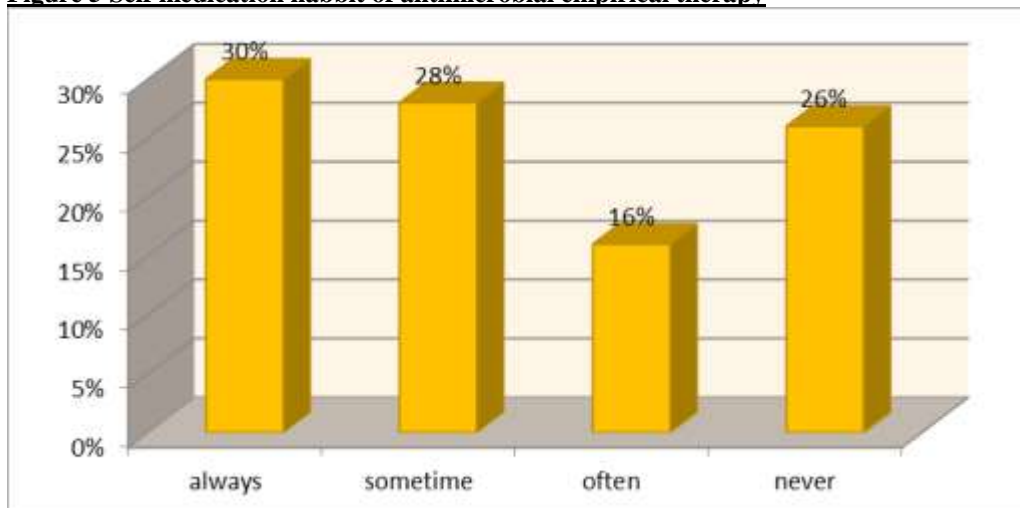
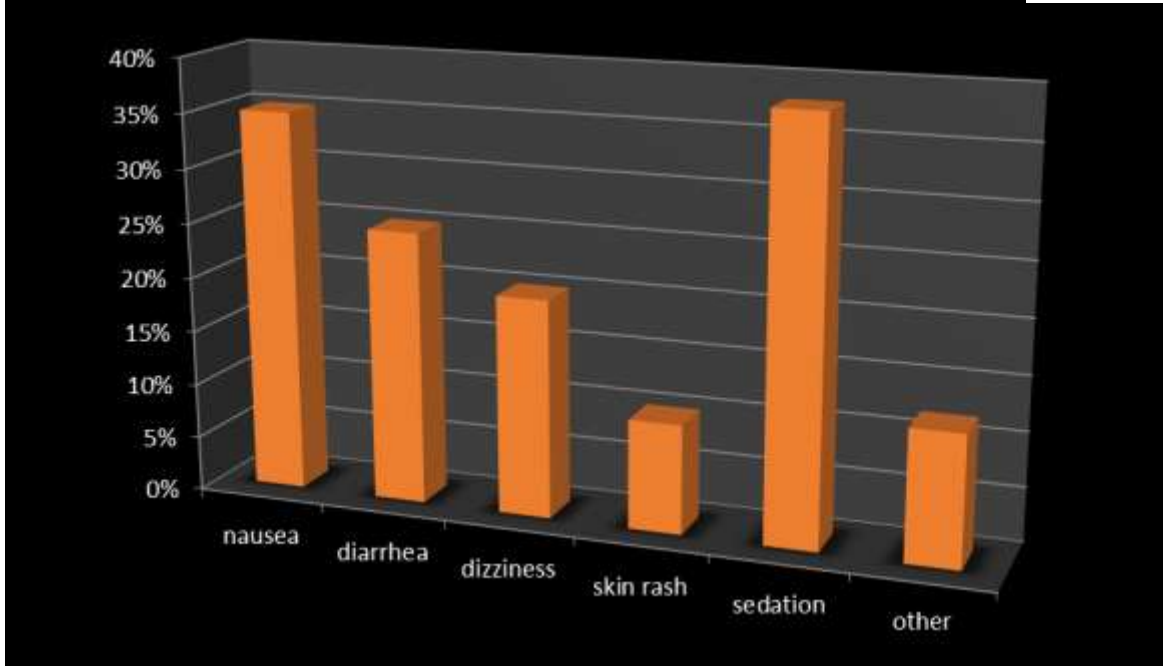
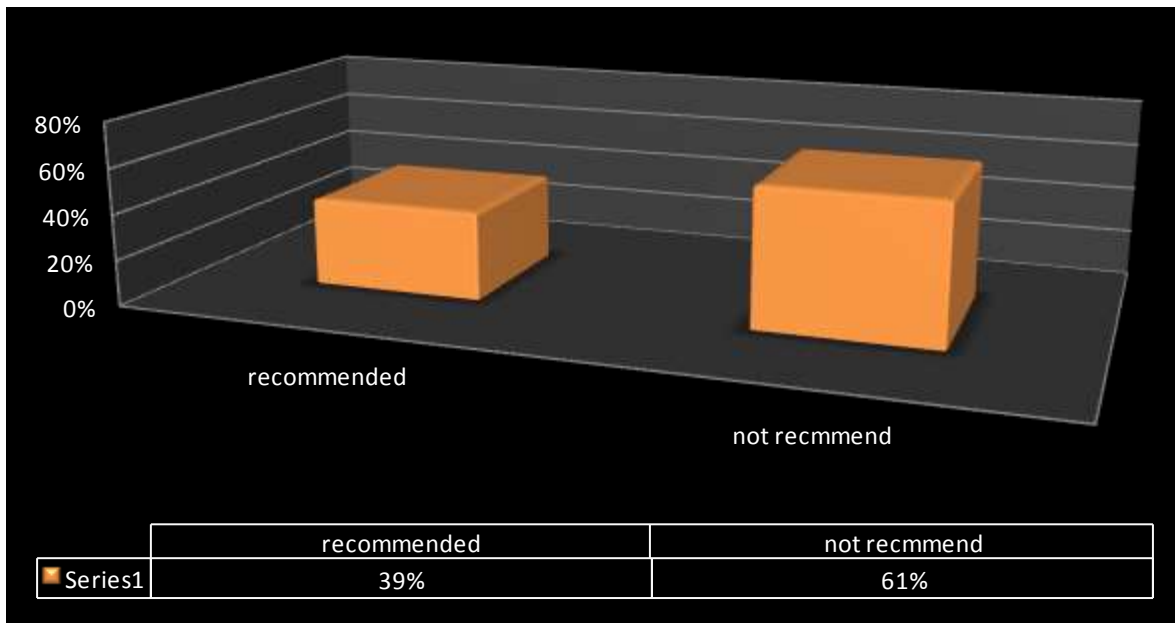


Figure 6 The statistics of some common side effects experience most commonly by peoples



In Pakistan The % ratio of doctors who recommend culture sensitive testing and those who don't shown in Figure 7.

Figure 7 Ratio of physician recommendation for culture sensitivity test in pakistan



DISCUSSION

In this study, we had three specific aims with the overall goal of providing standard information for improving antibiotic superintendency. Our first aim was to assess our empiric antibiotic use. Our second aim was to decide the precision of empiric antibiotic administration. Our final aim was to probe the consequences of unnecessary empiric

antibiotic therapy. Empiric antibiotics were commence for 26.3% percent of our patients. Of those patients, only 25.6% developed confirmed infections (“clinically right”). Thus, 74% of patients collecting empiric antibiotics did not have an infection (“clinically wrong”). Albeit we delineate our empiric antibiotic implimentations, we do not consciously delineate the regimen or address whether all patients received adequate

initial empiric therapy. Moreover, we used only a finite number of variables to resolve factors analogous with execute empiric antibiotics perfectly. Antimicrobial agents are some of the most extensive, and often erroneously, used pharmacological active drugs universally. meaningful deliberations when prescribing antimicrobial therapy comprise of an exact recognition of infection; adjudicate the difference between empiric and definitive therapy; analyze vacancy to move on spectrum of narrowed drugs, profitable oral agents for the shortest period essentially; considerates drug attributes that are inquisitive to antimicrobial agents (such as pharmacodynamics and efficacy at the site of infection); computing for host attributes that saturate antimicrobial bustle; and on other hand, perceiving the adverse effects of antimicrobial agents on the host. It is also meaningful to conceive the value of antimicrobial oversight, to know when to huddle infectious disease specialists for navigation, and to be able to etiquette situations when antimicrobial therapy is not required.

Culture sensitive testing is very common worldwide but in Pakistan it has no valuable importance most of the doctors recommend antibiotics to patients without knowing the main pathogen causing an illness. This therapy known as empiric therapy different drugs used as an empiric therapy which include Augmentin most commonly, ciprofloxacin and erythromycin etc. it is very valuable to aware doctors of Pakistan according to the consequences of culture sensitive testing because in some cases it was seen that these antibiotics shows different variety of common side effects including nausea, vomiting, diarrhea, sedation etc. The chronic use of empiric therapy may causes defiance to antibiotics which is another problem that matters a lot. One of the most common mistakes in antimicrobial use is enduring to add or switch antibiotics when a patient does not seems to be quip to therapy, even though there is no clear confirmation of an infectious disease. Most of the inflammatory, noninfectious or cancerous syndromes can commenced with symptoms and signs that imitate infectious diseases. Examples incorporate other connective tissue disorders that can present with high fever

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and adult onset disease; drug-induced fever; the fever associated with pulmonary emboli; lymphoma, which can commenced with fever, and recurrent sinusitis. Consolidation antibiotic therapy for nosy infections with negative strains bacteria is occupied in many health care dispositions, especially for some subgroups of patients, involving those with neutropenia, those with infections due to *Pseudomonas aeruginosa*, those with ventilator-correlated pneumonia, and the critically ill. A brawl can be made for empiric combination therapy, as we note an increase in infections generate by multidrug-resistant Gram-negative organisms. We provide a barometer from which we can upgrade antibiotic implementation. Our results support the view that annexes empiric antibiotics are correlated with worse aftereffect and more antibiotic days.

CONCLUSION

Initial empiric broad-spectrum antibiotic therapy is must for treatment of patients with serious infections following a thorough appraisal of possible sources, including culture and susceptibility testing. Clinicians may need to couturier antibiotic therapy based on the patient's initial response after the organism is confirmed, and susceptibility test results are available. relatively 14 percent of the patients get disproportionate empirical antibiotic treatment. Worse clinical results continuously were observed in the group of patients receiving improper empirical treatment. The appropriateness of antibiotic treatment for a given infection, in light of the availability of clearly defined clinical instructions is an easily evaluated facet of the quality of care.

Abbreviations:

CS culture sensitive
COPD chronic obstructive pulmonary diseases

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Conflict of Interest

There is no Conflict of Interest.

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