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Prospective cross-sectional observational study of drug utilization (Du 90%) in anti-malarial drugs

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Abstract
This was a Prospective Cross-Sectional observational study. The present drug utilization study was undertaken to analyse prescribing patterns include prescribing indicators and patient care indicators of the anti-malarial drugs. Total 200 subjects were enrolled in this study but only 60 patients data collected from Civil Hospital, Nasik, India. DU 90% achieved with Sulphadoxine+Pyrimethamine, Primaquine, Chloroquine, Artesunate, Taxim, Rantac which were the most prescribed drugs with having percentage of prescribing 51.11%, 23.27%, 8.61%, 1.53%, 0.085%, 2.90%, 3.25% respectively. The average number of drugs per prescription was 0.21. Percentage of drug prescribed from essential drug list was 100%. Present study showed that percentage of antibiotic prescribed was 1.66. In present study percentage of compliance was great but awareness should be get increased among patients, it is the responsibility of health care professionals to overcome this problem. Overall awareness among the physician should get increased by doing drug utilization studies to make health care Professionals more responsible and satisfy the priority health care needs of population.

Keywords: DU90%, Prospective, Cross-Sectional.

Introduction

Malaria occurs throughout most of the tropical regions of the world. This disease is widespread in subtropical regions in a broad band around the equator, including much of Sub-Saharan Africa, Asia, and the America (WHO, 1996) [9]. Malaria is a major public health problem in India and one which contributes significantly to the overall malaria burden in Southeast Asia (WHO, 2010) [10].

India contributes around 70% of malaria in South East Asian region. Although annually India reports about 2 million cases and 1000 deaths attributable to malaria (Olliaro P, Cattanni J, *et al*., 1996) [4]. The National Vector Borne Disease Control Program of India reported ~1.6 million cases and ~1100 malaria deaths in 2009 (WHO, 2009) [9].

Approximately 65% of those at risk for becoming infected with malaria in Southeast Asia are individuals residing in India (WHO 1977) [11]. Malaria remains one of the most important infectious disease in the world. (Dandorp AM, Nosten F, *et al*., 2009) [1]. In the 18th century the Italians associated malaria with bad air-malaria from where the malaria name is derived. It is a protozoal disease caused by parasites of the genus *Plasmodium* and transmitted to man by certain species of infected female *Anophiline* mosquito. Malaria remains one of the most important disease of developing world, killing 1-3 million people and causing disease in 300-500 million people annually worldwide (Tracy J W, Webster LT, 2001) [7]. In India the National Malaria Eradication Programme (NMEP) started in 1958, achieved near complete disappearance of the disease in 1960s.

However, due to development of insecticide resistance among mosquitoes and other factors it staged a comeback in 70s and continues to prevail in endemic and sub endemic proportions in different regions. Clinically malaria manifests as fever, chills, and anemia. Severe form of the disease may lead on to, metabolic acidosis, cerebral malaria, multi organ system failure, coma and death.

The infection mode is that the Sporozoites inoculated with the bite of mosquito leads to development of blood state infection and gametocyte which are infectious for mosquito. Gametocyte in human blood is taken up by the mosquito leading to fertilization and zygote formation in midgut. This is followed by haploid sporozoites that invades the salivary glands of mosquito and is subsequently transmitted back to humans due to the bite (Trager W, Jensen JB, 1976).

Malaria imposes a major global health burden in large part because the *Plasmodium* parasite readily evolves drug resistance. The *P. falciparum* resistance has arisen against all classes of first line anti-malarial drugs and several have had to be withdrawn from use in many Countries. Chloroquine (CQ), for instance, is no longer recommended for treatment of *P. falciparum* in India, and has been replaced with the more expensive Artemisinin-based Combination therapy (ACT).SP, mefloquine has developed resistance in widely used areas. It is now accepted as it cannot be prevented or avoided by the WHO that all drugs will eventually fail in the face of resistance evolution. The only solution to this failure is to shift to new therapies or reformulations of old ones when resistance becomes too widespread (Juliano, *et al.*, 2010) [3].

Malaria disease is important because it is still a major public health problem in many countries. More than 90 countries are affected and more than one third of the world population is exposed to the risk for contracting malaria. The number of cases in the world is estimated at 300 million to 500 million each year and the number of deaths at 1.5 million to 2.7million (Snow RW, *et al*., 1998) [5].

Drug utilization is the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences (WHO, 1977) [11].

A DU study is therefore a study designed to describe-quantitatively and qualitatively the population of users of a given drug (or class of drugs) and/or the conditions of use (for example, indications, duration of treatment, dosage, previous or associated treatments and compliance) (Hartzema AG, *et al*., 1998) [2].

Since last two decades, malaria control and treatment has been complicated by the emergence of resistance to widely used anti-malarial drugs such as chloroquine. To overcome on problem of resistance, newer drugs are needed (Trager W, Jensen JB, 1976).

Malaria is still a major public health problem in India and in rest of the world. As numbers of malaria cases are increasing due to irrational use, underuse, overuse of anti-malarial drugs it is important to study proper drug pattern, drug dose. This study helps to suggest improvements in financial and public health benefit and also study helps to reduce resistance to anti-malarial medicines. The present study helps to improve proper use of drugs to maintain quality of life of the society. Drug utilization study in malaria gives exact scenario of current therapies. DU 90% is the ideal tool for studying drug utilization. The present drug utilization study was undertaken to analyse prescribing patterns include prescribing indicators and patient care indicators of the anti-malarial drugs in Civil Hospital, Nasik, India.

Materials and Methods

The study was carried out in compliance with the Declaration of Helsinki, ICH-GCP, Schedule Y, ICMR and other applied regulatory guidelines. This was a prospective cross sectional observational study, by UDIRT carried out at Civil Hospital Nasik. Study was approved by the local Institutional Ethics Committee (IEC). Patients recruited from the study centre by obtaining proper voluntary written informed consent. Signed, dated written informed consent was taken from all patients after providing them patient information sheet and informed consent form before enrolling in the study. Total sample size was 200 but out of that only 60 patient's data was collected. The prescription data was extracted for this study. Permission to collect the data and accompany physicians on ward was taken from the head of Medical Ward of Civil Hospital before starting the study. The relevant data was collected in outpatient department and also from the inpatient department. Patient's prescription was studied for drug utilization in accordance with the protocol. Patient's prescription was studied as well as case record forms filled with the help of prescribed drugs and interview of subjects.

Study Duration: 8 Weeks

Primary Objective

1) To Evaluate the Drug Utilization 90% of Anti-malarial Drugs

Secondary Objective

1) To assess whether drug therapy is rational or not.
2) To assess extent of drugs properly used, overused or underused in civil h

a) Inclusion Criteria

1) The patient should diagnose with malaria disease.
2) Willingness to give informed consent.
3) Both female and male of various ages.

b) Exclusion criteria

1) Patient not willing to give inform consent.
2) Patients who are suffering from other disease.
3) Women who are pregnant.

Core Indicators

A) Prescribing Indicators:

1) Average Number of Drugs Per encounter.
2) % of Encounters with Injections Prescribed.
3) % of drugs prescribed from essential drug list.

B) Patient Indicators

1) Average Consultation Time.
2) Average Dispensing Time.
3) % of Drugs Actually Dispensed.

Result

Thetotal60patientsaccordingtoselectioncriteriawereselectedforpresentstudy.Totalnumberofprescriptionswhichwereanalyzedwas60andtotalnumberofdrugsprescribedwas13 from civil hospital from which 5 drugs were anti-malarials chloroquine, primaquine, falcigo, artisunate, sulfadoxine+pyrimethamine, one drug prescribed was anti-biotic taxim, and antacid rantac. Table 1 is showing prescribing indicators in patients of malaria. Table 2 shows the details of patient care indicators. Table 3 shows percentage of drugsused in the prescriptions given to patients of malariain Civil hospital. With this percentage DU90% was achieved forutilization of drugs in malaria shows the results of core indicators which were related to patient care. On the basis of the values given in Table 3, the average number of drugs per prescription was 0.21. Percentage of drugs prescribed by Generic name was 8.33%. Present study showed that percentage of prescriptions with anantibiotic prescribed was 1.66%. Percentage of drugs prescribed from essential drug list was 100%. Average consulting time was 6.63 minutes. Average dispensing time was 5.73 Minutes. Percentage of drugs actually prescribed was 100%.

This study shows that percentage of rational use of anti-malarial drugs in both IPD and OPD of Civil Hospital was 73%, while irrational use was 27%. Rational use of anti-malarial drugs in OPD patients of civil hospital was 58% while irrational use was 42%.Rational use in IPD of Civil hospital was 15% and irrational use was 85%.

Discussion

The aim of this study to evaluate the Drug Utilization Pattern (DU 90%) of Anti-malarial Drugs. To study drug utilization using WHO indicator is to assess Medicine prescribed by generic name, no. of drug prescribed from essential drug list and to assess Percentage of encounter with an injection prescribed. Drugs play an important role in protecting, maintaining and restoring health. Prescription writing is a science and an art, as it conveys the message from the prescriber (Doctor) to patients. To produce the desired effect, drugs have to be safe and efficacious and there should be rational use of medicine. In this study Sulphadoxine has first preference as it was prescribed as 51.11% and below that Primaquine 23.27, Falcigo 8.61, Chloroquine1.53, and Artesunate 0.085. %.Present study showed that percentage of prescriptions with an antibiotic prescribed was 1.66%. Percentage of drugs prescribed from essential drug list was 100%. Average consulting time was 6.63 minutes. Average

dispensing time was 5.73 Minutes. Percentage of drugs actually prescribed was 100%.

In this study mostly generic medicines were prescribed as compared to branded drugs. Also in civil hospital consultation time was very less. In civil hospital prescriptions were having more number of drugs prescribed from essential drug list.

This study shows that percentage of rational use of anti-malarial drugs in both IPD and OPD of Civil Hospital was 73%, while irrational use was 27%. Rational use of anti-malarial drugs in OPD patients only was 58% while irrational use was 42%. It is also found in the study that irrational use of anti –malarial drugs were more in IPD department of civil hospital (85%). Anti-biotic was prescribed in many of IPD patients may be due to improper confirmatory diagnosis so anti-malarial treatment should be started after proper diagnostic tests so that unnecessary and wrong use of drugs which is the major problem in the community will be minimized. Diagnostic tests such as Rapid diagnostic test and peripheral smear for malarial parasite should made compulsory in all suspected cases of malaria in Civil Hospital so as to avoid unnecessary use of medicines that will help to reduce irrational use of medicines. Rational use in IPD patients was 15% and irrational use was 85%.

Conclusion

In this complete study drugs from essential drug list and generic medicine were prescribed more as compared to branded drugs so it is good for the society. Rationality was also maintained in this study but there still irrational use of medicines it should get reduced. Antibiotic use was more without confirmatory diagnosisso it should get reduced. Percentage of compliance was great but awareness should be get increased among patients, it is the responsibility of health care professions to overcome this problem. Overall awareness among the physician will get increased by doing drug utilization studies to make health care Professionals more responsible and satisfies the priority health care needs of population. Further studies are required to provide time to time standard treatment guidelines for practicing physicians.

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