

The Observational, Cross-Sectional Study of Drug Utilization in the Patients of Ischemic Heart Disease (IHD)

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ABSTRACT

Background: IHD is the major cause of mortality in India. This was observational, cross-sectional study. The study was conducted at the cardiac OPD, Private Hospital, Nashik, Maharashtra. **Objective:** To determine and calculate Drug Utilization 90% in Ischemic Heart Disease patients. **Material & Methods:** The Study was conducted in ICH GCP, Schedule 'Y' guidelines and Indian regulatory requirements. Approval of Institutional ethics committee was taken. Provided to subject a patient information sheet and inform consent form before screening. Then signed dated written informed consent was taken and also observing a Prescription and taken information required from it. Analysis from the whole data, appropriate statistical methods applied according to the objectives. **Result:** Total 145 patients were selected for present study of which 32% were female patients and 68% were male patients. Total number of prescription which analysed was 145 and total number of drugs prescribed was 622. Drug Utilization 90% was achieved from collection of data. All drugs were studied and calculate DDD/1000/day and DDD% for each drug. **Conclusion:** We found that 90% of drug utilization of Anti-IHD drugs was achieved in private hospital, Nashik. Aspirin and Clopidogrel are the commonly used antiplatelet drugs. In this complete study drugs from essential drug list and Rationality was also maintained in this study. In Present study of which 32.4% were female patients and 67.6% were male patients. Males are affected more than females. Trade names were used more often when compared to generic names.

Keywords: Defined Daily Dose, Drug Utilization, DU 90%, Ischemic Heart Disease

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INTRODUCTION

World Health Organisation (WHO) defined Drug Utilization (DU) research in 1977 as "The marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences" (Introduction to drug utilization research- WHO) [1].

The DU 90% segment reflects the number of drugs that account for 90% of drug prescriptions and adherence to the local or national prescription guidelines. The DU 90% segment reflects the number of drugs that account for 90% of drug prescriptions and adherence to the local or national prescription guidelines to obtain a rough estimate of the quality of prescribing. Anatomical Therapeutic Chemical (ATC)/

Defined Daily Dosage (DDD) classification given by WHO Collaborating Centre for Drug Statistics Methodology, Oslo, Norway is used to calculate DDD, DDD%. DDD can be defined as the assumed average maintenance dose per day for a drug used for its main indication in adults [2-3]. The purpose of the ATC/DDD system is to serve as a tool for drug utilization research in order to improve quality of a drug use [4]. In India Ischemic Heart Disease is the major cause of mortality. Compare with the females Males are more affected. It is projected that Will result in 2.5 million Indian deaths up to 2020 due to the Ischemic Heart Disease [5]. Inadequate supply of blood and oxygen to a portion of

the myocardium it is a condition of Ischemic heart disease (IHD); typically it occurs when there is an imbalance between myocardial oxygen supply and demand. The most common cause of myocardial ischemia is Atherosclerotic disease of an epicardial coronary artery [6]. The two types of risk factors of IHD that one is modifiable and second is non-modifiable factors. Modifiable risk factors include the following conditions like Cigarette smoking, High blood pressure, Elevated serum cholesterol, Diabetes, Obesity, Sedentary habits, Stress. Non-modifiable risk factors include Age, Sex, Family history, Genetic factors [7-13]. Angina (characteristic chest pain) and decreased exercise tolerance it is a symptoms of stable IHD, while unstable IHD presents itself as chest pain or other symptoms at rest, or rapidly worsening angina. Inability of the heart to pump blood according to the body's need is cause of shortness in breath. Blocked coronary artery cause the heart attack, signs and symptoms include crushing pressure in chest and radiation of pain to shoulder or arm, with shortness of breath and sweating, such as nausea and back or jaw pain. Without any apparent signs or symptoms of heart attack can also occur [6].

Drug therapy, Percutaneous Coronary Intervention (PCI) and Coronary Artery Bypass Grafting (CABG) all this are the treatment options for IHD. In the drug therapy involves the use of Statins, Aspirin, Beta blockers and Calcium channel blockers, Nitrates, Angiotensin Converting Enzyme (ACE) inhibitors, Aspirin and Antiplatelet Therapy. These drugs act by decreasing the levels of blood cholesterol, decreasing the myocardial oxygen consumption, cause vasodilatation and prevents clotting of blood- thus relieving the signs and symptoms. [14]

DU90% method has shown to be a valuable tool for assessing the overall quality in prescribing and to form the basis for more specific analysis using prescription, patient specific quality indicators. This was observational, cross-sectional study of Drug Utilization (DU) 90% in the patients of Ischemic Heart Disease. In this research aim to find out Drug Utilization 90% in the patients of Ischemic Heart Disease (IHD).

Many groups of drugs are used in the treatment of IHD. The present study helps to improve proper use of drugs to maintain quality of life of the society.

MATERIALS AND METHODS

This was observational and cross sectional study. Study was conducted in compliance with the protocol, ICH GCP, Schedule 'Y' guidelines and Indian regulatory requirements. Approval of Institutional ethics committee was taken prior to initiation of study. Enrolment of patient was done as per inclusion and exclusion criteria. Before collecting the data or observing a prescription, signed dated written informed consent was taken from all subjects after providing them with patient information sheet and informed consent form before screening. It was the study of prescriptions among the patient of Ischemic Heart diseases (IHD). Data from prescriptions was collected at the cardiac OPD of Private Hospital Nashik, Maharashtra, from the patients of age group above 18 years.

Total 145 prescriptions were collected from the patient and data from prescription were recorded in Case Record Form with the help of interview of patient. Core indicators were also studied, with help core indicators we can make out the pattern of drug use in Ischemic Heart disease (IHD). The data collected from each prescription were summarized. Analysis from the whole data, appropriate statistical methods applied according to the objectives. Prescriptions were studied and analysis was done as per WHO drug utilization study guidelines. After obtaining the Statistical analysis discussion & conclusion were drawn.

Study Duration: 8 Weeks

Sample size- 145

OBJECTIVES:

Primary Objective-

To determine and calculate DU 90% in Ischemic Heart Disease patients.

Secondary Objective-

To obtain prescribing information in Ischemic Heart Disease patients.

SELECTIVE CRITERIA:

Inclusion Criteria-

1. All patients who receive medication For IHD at Cardiology department.
2. Above 18-no upper limits.
3. Subject of either sex.

Exclusion criteria-

1. IPD patients with IHD.
2. Those who are unable to comply due to mental retardation.
3. Those who are not willing to give ICF.

STATISTICAL PLAN

Data analyses done by calculating the following prescription core indicator

1. DDD/1000/Day=

$$\frac{\text{Total no. of dosage units prescribed} \times \text{strength of each dose} \times 1000}{\text{DDD (ATC)} \times \text{duration of study in weeks} \times \text{total sample size}}$$
2. DDD% =

$$\frac{\text{DDD/1000/day of particular drug} \times 100}{\text{Sum of DDD/1000/day total drugs}}$$

RESULTS

Total 145 patients according to selection criteria were selected for present study of which 32% were female patients and 68% were male patients show in (Fig. 1). Total number of prescription which analysed was 145 and total number of drugs prescribed was 622. From collected data for Drug Utilization pattern for the treatment of Ischemic heart diseases in private hospital DU 90% was achieved. (Table 1) showed name of drug utilized for Ischemic heart diseases, ATC code of drugs, DDD / 1000 / Day of each drug and then calculated DDD%. (Table 1) stated that total 49 drugs studied in DU 90% in cardiovascular diseases. All drugs were studied and calculate DDD/1000/day and DDD% for each drug. (Fig. 1) shows name and DDD% of that drug which achieved DU 90%. Following drugs were included in DU 90% Aspirin 15.35%, Clopidogrel 13.23%, Pantoprazole 12.11%, Atorvastatin 9.85%, Rosuvastatin 4.22%, Aspirin 150 mg 6.47%,

Torseimide 5.98%, Atorvastatin 20 mg 5.06%, Atorvastatin 10 mg 2.39%, Amlodipine 2.39%, Domeperidon 2.53%, Esomeprazole 2.25%, Nebivolol 1.97%, Metoprolol 1.66%, Glimepiride 1.58%, Metformin 500 mg, 1.58% and Nitroglycerine 1.39%. Total 622 drugs were studied out of which 583 drugs prescribed from essential drug list. (Table 2) showed results for core indicator which were related to Prescribing indicator. Average no. of drug per prescription was 4.28, drug prescribed by generic name was 0%, drug prescribed by Essential drug list was 93.7% and General Drug prescribed by 6.3%. The entire drug prescribed by brand name only.

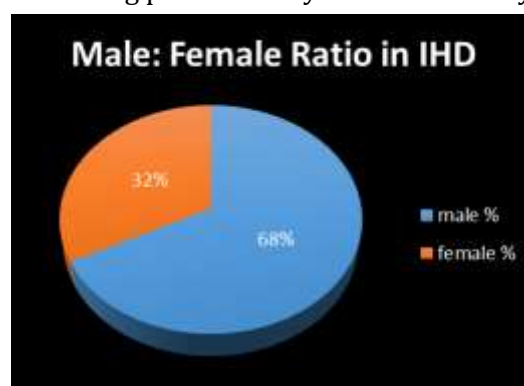


Figure 1: Percentage of Male and Female

The total patients was categorised by age wise. In between 21-30 age group patients were 0.68%, 31-40 age group patients were 5.51%, 41-50 age group patients were 23.44%, 51-60 age group patients were 32.41%, 61-70 age group patients were 24.82%, 71-80 age group patients were 11.03%, 81-90 age group patients were 2.06% enrolled which was shown in (Fig. 2).

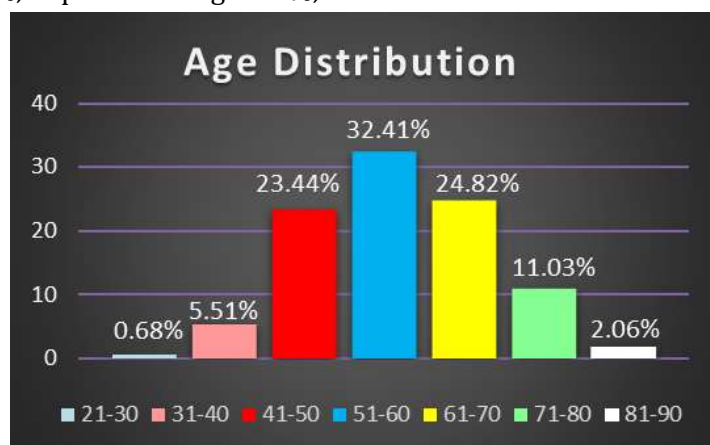


Figure 2: Age Distribution of Patients

Table 1: Percentage of Drug Prescribed for Drug Utilization in IHD

Name of drugs	ATC code	DDD	DDD/1000/day	DDD %
Aspirin 75	N02BA01	1 Tab	150.3448	15.35041
Clopidogrel	B01AC04	75	129.6552	13.23797
Pantoprazole	A02BC02	20	118.6207	12.11133
Atorvastatin 40	C10AA05	20	96.55172	9.858063
Rosuvastatin	C10AA07	10	41.37931	4.224884
Aspirin 150	N02BA01	75	63.44828	6.478156
Torsemide	C10AX01	4	58.62069	5.985253
Atorvastatin 20	C10AA05	20	49.65517	5.069861
Atorvastatin 10	C10AA05	20	23.44828	2.394101
Amlodipine	C08CA01	5	23.44828	2.394101
Domperidon	A03FA03	30	24.82759	2.534931
Esomeprazole	A02BC05	20	22.06897	2.253272
Nebivolol	C07AB12	5	19.31034	1.971613
Metoprolol	C07AB02	150	16.32184	1.666482
Glimepiride	A10BB12	2	15.51724	1.584332
Metformin	A10BA02	2000	15.51724	1.584332
Nitro-glycerine	C01DA02	5	13.62759	1.391395
Clopidogrel	B01AC04	75	11.03448	1.126636
Prasugrel	B01AC22	10	11.03448	1.126636
Ramipril	C09AA05	2.5	9.655172	0.985806
Torasemide	C03CA04	15	8.735632	0.89192
Hydrochlorothiazide	C03AA03	25	7.586207	0.774562
Ivabradine	C01EB17	10	6.206897	0.633733
Amlodipine	C08CA01	5	5.517241	0.563318
Digoxin	C01AA05	0.25	5.517241	0.563318
Olmesartan	C09CA08	20	4.137931	0.422488
Nebivolol	C07AB12	5	3.448276	0.352074
Nicorandil	C01DX16	40	2.758621	0.281659
Ranitidine	A02BA02	300	2.758621	0.281659
Telmisartan	C09CA07	40	2.758621	0.281659
Bisoprolol	C07AB07	10	2.068966	0.211244
Metoprolol	C07AB02	150	1.83908	0.187773
Cyanocobalamin	B03BA01	1	1.655172	0.168995
Bisoprolol	C07AB07	10	1.37931	0.140829
Metformin 1000	A10BA02	2000	1.37931	0.140829
Telmisartan 20	C09CA07	40	1.37931	0.140829
Atenolol	C07AB03	75	0.91954	0.093886
Carvedilol 3.125	C07AG02	37.5	0.91954	0.093886
Ranolazine	C01EB18	1500	0.91954	0.093886
Glipizide	A10BB07	10	0.689655	0.070415
Omeprazole	A02BC01	20	0.689655	0.070415
Gabapentin	N03AX12	1800	0.613027	0.062591
Folic Acid	B03BB01	10	0.413793	0.042249
Nortriptylin	N06AA10	75	0.367816	0.037555
Amitriptyline	N06AA09	75	0.275862	0.028166
Pyridoxine	A11HA02	160	0.258621	0.026406
Nicorandil	C01DX16	40	0.060345	0.006161
Thyroxin 25	C10AX01	4	0.043103	0.004401
Thyroxin 50	C10AX01	4	0.034483	0.003521
TOTAL			979.4188	100

DU 90%

Table 2: Details for Prescription Indicator in Patient’s Prescriptions

Name of indicator	Result
Average no. of Drugs per prescription	4.28
Drug prescribed by generic Name	00%
Drugs from Essential Drug List	93.7%
General Drug prescribed	6.3%

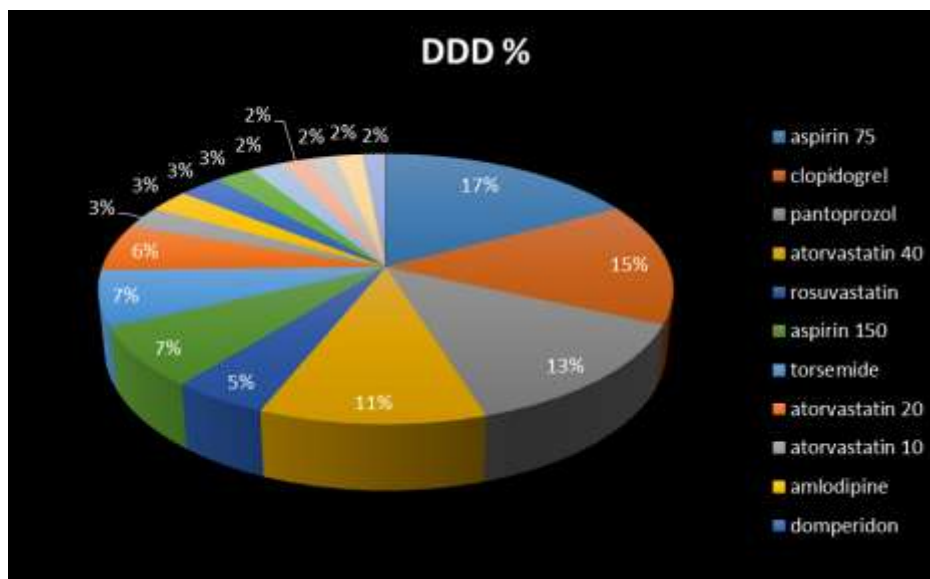


Figure 3: Defined Daily Dose in percentage which achieved DU 90%

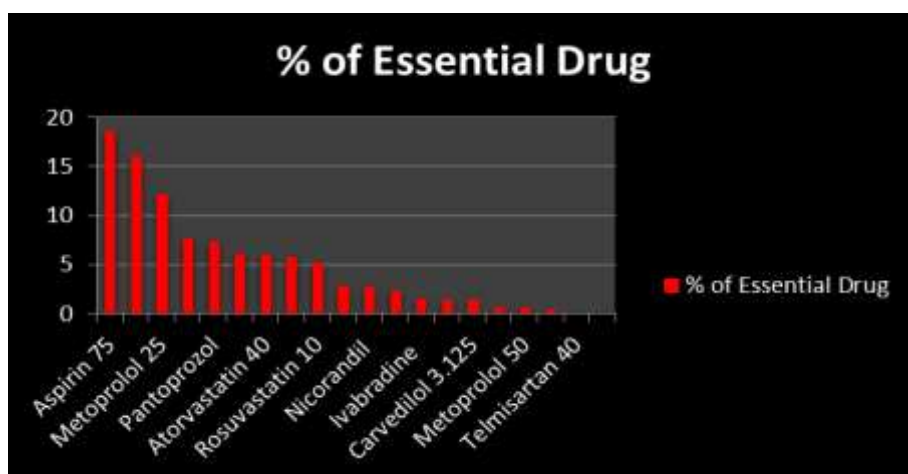


Figure 4: Name of Prescribed from Essential Drug List and Their Frequency

(Fig. 4) showed result of drugs prescribed from Essential drug list. Total 93.72% drugs prescribed from essential drug list. Aspirin was first rank drug which were prescribed 18.69% of prescriptions, second rank Clopidogrel 16.12%, third rank Metoprolol 12.27%, fourth rank Metformin 7.71% and Pantoprazole fifth rank 7.37% prescribed from Essential drug list.

DISCUSSION

Drug prescriptions a very important point of connection between doctors and patients.

The Ischemic Heart diseases (IHD) burden increased worldwide as well as in India. Total 145 patients according to selection criteria were selected for present study of which 32.4% were female patients and 67.6% were male patients, the majority of males were greater than the female. The common Ischemic Heart Disease (IHD) found in this study was Hypertension, Angina pectoris, MI etc. HNT was the major cardiovascular disease found in most patients. To treat the IHD and to maintain

good blood supply to heart antiplatelet aggregating drugs utilized most commonly and frequently.

Aspirin was oral antiplatelet aggregating drug utilized 15.35 % and Clopidogrel utilized 13.23% for same indication. The combination of Clopidogrel therapy with Aspirin may offer benefits over either drug used alone. Clopidogrel and Aspirin decrease the rate of combined end point of cardiovascular deaths. Most of hypertensive patients had hyperacidity so that they were prescribed with Proton pump inhibitor drug like Pantoprazole which was utilized 12.11%. Rosuvastatin and Atorvastatin these lipid lowering agents utilized more and they achieved DU 90% the same result stated in study. Torsemide anti-hypertensive drug was utilized 5.98%, Metoprolol beta blocker drug was utilized 1.66%. Total 622 drugs were prescribed for Ischemic Heart diseases (IHD) in Private hospital. The Percentage of drugs prescribed from essential drug list was 93.72%. Aspirin was first rank drug which were prescribed 18.69% of prescriptions, second rank Clopidogrel 16.12%, third rank Metoprolol 12.27%, fourth rank Metformin 7.71% and Pantoprazole fifth rank 7.37% prescribed from Essential drug list.

All the 622 drugs were prescribed by brand name only means 100% drugs prescribed by brand name. Branded medicines were more costly than generic medicines hence cost burden of diseases were increased on patients treated in private hospital due to branded medicines and consultation charges. In between 21-30 age group patients were 0.68%, 31-40 age group patients were 5.51%, 41-50 age group patients were 23.44%, 51-60 age group patients were 32.41%, 61-70 age group patients were 24.82%, 71-80 age group patients were 11.03%, 81-90 age group patients were 2.06% enrolled.

Diuretics like Torsemide achieved DU 90%. Diuretics are said to be superior to α -blockers, CCBs, and ACEIs in preventing one or more forms of CVDs, including stroke and heart failure Most of prescriptions were got prescribed with knowing drug indication and therefore drugs got prescribed relevant to symptoms and diagnosis of patients. Private hospital was show rational

prescribing pattern with proper examination as well as consultation of patients. And also had knowledge of duration, frequency, dose etc. are clearly mention in their prescription. Present study showed that there was need for improvement in prescription writing for prescribed more generic medicines as compare to branded medicines for the benefits and safety of patients and society. Drugs prescribed from Essential drug list which best for the patients.

From collected data for Drug Utilization pattern for the treatment of Ischemic heart diseases in private hospital DU 90% was achieved.

Name of drug utilized for Ischemic heart diseases, ATC code of drugs, DDD / 1000 / Day of each drug and then calculated DDD%. Total 49 drugs studied in DU 90% in cardiovascular diseases. All drugs were studied and calculate DDD/1000/day and DDD% for each drug. Name and DDD% of that drug which achieved DU 90%. Following drugs were included in DU 90% Aspirin 15.35%, Clopidogrel 13.23%, Pantoprazole 12.11%, Atorvastatin 9.85%, Rosuvastatin 4.22%, Aspirin 150 mg 6.47%, Torsemide 5.98%, Atorvastatin 20mg 5.06%, Atorvastatin 10mg 2.39%, Amlodipine 2.39%, Domeperidon 2.53%, Esomeprazole 2.25%, Nebivolol 1.97%, Metoprolol 1.66%, Glimepiride 1.58%, Metformin 500mg 1.58% and Nitroglycerine 1.39%.

CONCLUSION

We found that 90% of drug utilization of Anti-IHD drugs was achieved in private hospital, Nashik. Aspirin and Clopidogrel are the commonly used antiplatelet drugs. In this complete study drugs from essential drug list and Rationality was also maintained in this study. The Present study of which 32.4% were female patients and 67.6% were male patients. Males are affected more than females. Trade names were used more often when compared to generic names. If only generic names are used the financial burden on the patient can decrease. Overall, awareness among the physician should be get increased by doing DU studies to make health care society more responsible and satisfies the priority health care needs of population.

REFERENCES

1. WHO Int WG for Drug Statistics Methodology. Introduction to Drug Utilization Research. Solutions. 2003; 1-48.
2. WHO, 2007, Collaborating Centre for Drug Statistics Methodology(ed.). Guidelines for ATC Classification and DDD Assignment, Oslo, Norway
3. Joqvist, F., WHO booklet "Introduction to Drug Utilization Research" 2003. ISBN, 92(4), pp.76-84.
4. Ghosh, A, Das, A, Saha,U, 2012, Drug utilization study in patients of acute coronary syndrome on follow-up visits at a tertiary care centre in Kolkata, Asian Journal of Pharmacy and Life Science, vol.2, pg. no.155-165.
5. Antman EM, Andrew P, Selwyn JL. Harrison's principles of internal medicine. - 18th Ed.; 2012:1998-2014.
6. Spinar J. Hypertension and Ischaemic Heart Disease. Cor Et Vasa. 2012.
7. Menotti, A., Blackburn, H., Kromhout, D., Nissinen, A., Fidanza, F., Giampaoli, S., Buzina, I., Mohacek, I., Nedeljkovic, S., Aravanis, C. and Toshima, H., 1997. Changes in population cholesterol levels and coronary heart disease deaths in seven countries. European Heart Journal, 18(4), pp.566-571.
8. Frikke-Schmidt, R., Nordestgaard, B.G., Jensen, G.B., Steffensen, R. and Tybjaerg-Hansen, A., 2008. Genetic variation in ABCA1 predicts ischemic heart disease in the general population. Arteriosclerosis, thrombosis, and vascular biology, 28(1), pp.180-186.
9. Kokkinos, P.F. and Fernhall, B., 1999. Physical activity and high density lipoprotein cholesterol levels. Sports Medicine, 28(5), pp.307-314.
10. Phillips, G.B., Castelli, W.P., Abbott, R.D. and McNamara, P.M., 1983. Association of hyperestrogenemia and coronary heart disease in men in the Framingham cohort. The American journal of medicine, 74(5), pp.863-869.
11. Jenkins, C.D., Rosenman, R.H. and Zyzanski, S.J., 1974. Prediction of clinical coronary heart disease by a test for the coronary-prone behavior pattern. New England Journal of Medicine, 290(23), pp.1271-1275.
12. Roerecke, M. and Rehm, J., 2010. Irregular heavy drinking occasions and risk of ischemic heart disease: a systematic review and meta-analysis. American journal of epidemiology, 171(6), pp.633-644.
13. Thomas Michel BBH. Goodman & Gilman's pharmacological basis of therapeutics. - 12th Ed.; 2011:745-788.
14. Bachhav, S.S. and Kshirsagar, N.A., 2015. Systematic review of drug utilization studies & the use of the drug classification system in the WHO-SEARO Region. The Indian journal of medical research, 142(2), p.120.