Concepts of P Drug Selection

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Abstract

Background:
Personal (P) drug selection is an important part of the pharmacology teaching and learning session. Most of the textbooks that are commonly followed by the medical schools of Nepal merely tell about the concepts of P drug selection. Most of the time it is found that student cannot follow the concepts of P drug. Most of the literature that is available is in the international level, like international journals, guide to good prescription, teachers guide to good prescription etc. At the national level very few references are available. The activity of P drug selection can reduce the chances of irrational prescribing that is common problem in developing country like Nepal. Some of the important concepts regarding P Drug selection like it is a personal drug for a doctor and it is not for a patient, P drug is selected for a disease and not for a particular patient is also has been emphasized in this paper.

Keywords: Personal Drug, Pharmacology

Background

In Nepal Medical education is an integrated teaching of four and half years for MBBS degree[1-4]. Manipal College of Medical Sciences, Pokhara which is the first private medical college of Nepal established on 1994 .It has students from Nepal and also international students from Srilanka, Bangladesh, India, Canada, US and Africa[5]. The author has joined MCOMS on 2008 as a MD Pharmacology resident and is actively involved in teaching and learning process of P Drug selection since then. The method for selection of P drug that is followed in this institution has been discussed in this paper.

Personal (P) drug selection is an important part of the pharmacology teaching and learning session. It is also a part of the university pharmacology curriculum. Most of the textbooks that are commonly followed by the medical schools of Nepal merely tell about the concepts of P drug selection. Most of the time it is found that student cannot follow the concepts of P drug. Most of the literature that is available is in the international level, like international journals, guide to good prescription, teachers guide to good prescription etc. At the national level very few references are available. At present the P-drug selection is carried out at very few medical schools of Nepal namely MCOMS, KISTMC and IOM in Nepal. Traditional pharmacology teaching and learning methodology does not train the students to think and make decisions about the prescription writing[6].

The practical activity of P drug selection can reduce the chances of irrational prescribing that is common problem in developing country like Nepal.

P drug is the personal drug for a doctor and it is not for a

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patient. P drug is selected for a disease and not for a particular patient / Case. P drug can vary from doctor to doctor, country to country because of variation of cost, national formularies, essential drug list of the country, personal elucidation of information.

Steps of selection of P Drug [7,8]:

1. Definition of the disease: Define the problem
2. List the therapeutic objectives
3. List the drugs: Based on the classification of drugs
4. Choose the effective group based on the criteria's: Efficacy, Safety, Cost and Convenience/ suitability
5. Choose a P Drug: Choose an active substance and a dosage form, Standard dosage schedule , duration of treatment

Methods of selecting a P Drug [6,9]:

1. A score between 0-1 is given for 4 criterias of Efficacy, Safety, Cost & Convenience/Suitibility.The score depends on the significance of the criteria for a disease. Eg. For Amoebic Dysentery- efficacy (0.4), safety (0.3), cost (0.1) and convenience (0.2). This 0.4, 0.3, 0.2 and 0.1 is also called as the weight.
2. The total score should add up to 1. (0.4+0.3+0.1+0.2=1).
3. A group of drugs are chosen based on the classification of drugs.
4. Each group a score between 1-10 is given on all the 4 criterias after comparing with all the groups of drugs (higher score indicates a better value).
5. The value is then multiplied by the weight in all the categories
6. Then the values are added together and the group which is having the highest score is the selected group.
7. The same method is followed in selection of sub group and the particular drug from the selected group of drugs.

Example of a P drug selection:

Select a P drug for Urinary tract infection. Ambika Rai is a 27 year school teacher who is suffering from uncomplicated UTI, recently it was found that she is allergic to cotrimoxazole and her urine pregnancy test is positive. Verify the suitability of the selected P drug in this case? Write a prescription for her.

Step 1: Definition: Urinary tract infection is a disease which is caused by bacterias namely E.coli, Klebsiella, Pseudomonas etc. which is characterized by burinng micturation, fever, chills etc.

Step 2: Therapeutic objective: Eradicate the bacterias from urinary system so that the signs ad symptom of the disease decreases.

Step 3: List the classification of drugs[10]

Step 4: Choose the P Drug based on efficacy (0.4), safety (0.3), cost (0.1) and convenience (0.2).Total score of 1 is given. This is shown in a tabulated manner in Table 1 and 2.

This Weight which is given is not fixed and it varies from disease to disease and it depends on the severity of the disease.

Efficacy: Pharmacokinetics and Pharmacodynamics of drugs should be considered [7,8].

Safety: Study about the adverse effects of the drugs, Drug interactions etc.

Cost: The total cost of the treatment should be calculated rather than the cost of per unit. Cost and Convenience/ suitability really come to play in calculating the score for individual drugs. Thus while choosing the group of drugs it is recommended to accentuate the other criteria and deal with cost and Convenience /suitability only in broader terms[8].

Convenience/ Suitability: Convenience of drugs is based on the availability of drugs, whether the drug is injection or oral medication, frequency of administration of a drug[11].

Table 1: Tabulation of Group of drugs and the criterias of Efficacy, Safety, Cost, and Convenience/Suitability

Groups Of Drugs	Efficacy	Safety	Cost	Convenience / Suitability	Total
	(0.5)	(0.2)	(0.2)	(0.1)	(1)
Cotrimoxazole	8(4)	5(1)	8(1.6)	7(0.7)	7.3
Penicillin	8(4)	7(1.4)	7(1.4)	6(0.6)	7.4
Cephalosporins	8(4)	8(1.6)	5(1.0)	7(0.7)	7.3
Fluroquinolones	9(4.5)	6(1.2)	7(1.4)	7(0.7)	7.8
Aminoglycosides	7(3.5)	7(1.4)	7(1.4)	5(0.5)	6.8
Urinary Antiseptics	8(4)	9(1.8)	8(1.6)	8(0.8)	8.2

The selected group of drugs is urinary antiseptics

Table 2: Tabulation of drugs and the criterias of Efficacy, Safety, Cost, and Convenience/Suitability

Drugs	Efficacy	Safety	Cost	Convenience / Suitability	Total
	(0.4)	(0.3)	(0.2)	(0.1)	(1)
Nitrofurantoin	8(3.2)	8(2.4)	9(1.8)	7(0.7)	8.1
Methanamine	6(2.4)	6(1.8)	6(1.2)	5(0.5)	5.9
Nalidixic acid	5(2.0)	7(2.1)	8(1.6)	6(0.6)	6.3

Step 5: The selected P Drug is Nitrofurantoin

Tab Nitrofurantoin 100 mg Three times a day for 7 Days.

Verification for the case:

Ambika Rai is a 27 year school teacher who is suffering from uncomplicated

UTI, recently it was found that she is allergic to cotrimoxazole and her urine pregnancy test is positive.

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The drug which is choosen as a P drug whether it is effective and safe in this case?

In this case as the patient is pregnant the drugs which are not given (contraindicated)

a. Sulfonamide and Cotrimoxazole: Teratogenic risk and causes neonatal hemolysis
b. Fluroquinolones: Cartilage damage and arthropathy
c. Aminolycosides: Ototoxicity
d. Tetracyclines: Brownish discolouration of teeth , temporary suppression of bone growth
e. Chloramphenicol: Gray baby syndrome, bone marrow suppression
f. Nitrofurantoin: Hemolytic anaemia in 3RD Trimester of pregnancy

She is also found allergic to cotrimoxazole (Fixed dose combination of sulfonamide and trimethoprim) cannot be given in this case.
Drugs which are relatively safe in pregnancy are
PeniciliinG, Amoxicillin, Ampicillin, Amoxicillin- Clavurinic acid, Cloxacillin, Piperacillin, Cephalosporins, Erythromycin.
Treatment can be given in this case is Penicillins, Cephalosporins etc.
Amoxycillin , co amoxyclav , ampicillin- used in the past as first line .Many strains of E.coli are now ampicillin, coamoxyclav resistant thus cephalospronis will be a good choice in this case.They are effective against gram negative bacteria, some inhibit pseudomonas too. Some are effective against Klebsiella and proteus infections.
So my prescription will be cephalosporins 3rd generation.

Prescription

Dr. Date:
MBBS, MD
Phone no.
Address:
NMC Regd.no.

Patient Name: Ambika Rai
Age: 27 yrs
Sex: Female
Address: Mahendrapool, Pokhara
Nepal
Diagnosis: Uncomplicated Urinary tract infection with pregnancy

Rx
1. Tab. Cefixime 200mg
Dispense- 10 tabs
Direction: I tab to be taken twice a day after food for 5 days
Follow up after 5 days.

……
Signature of Doctor

Note:
In certain diseases we can give more weight on efficacy rather than other criterias. Example AIDS, Carcinomas etc.where the prognosis of disease is very poor. So we have to prescribe the highly efficacious drugs so that the patient can live in a better way.
As in case of acute and severe form of disease like myocardial infarction we require highly efficacious drugs so we can give more weight on the efficacy rather than other 3 criterias.
Conditions where we can give more weight on safety than efficacy for example efficacy (0.3), and safety (0.4): Diseases where we use drugs with narrow therapeutic index like in mania (Lithium), in Congestive cardiac failure (digoxin), Arrhythmias.
In certain circumstances we can give more weight on Cost (0.3), where the drugs are used for long time or life time. Eg Diabetes Mellitus, Rheumatic fever, Hypertension, Congestive heart failure, Parkinsonism.
In some diseases we can give more weight on convenience (0.3). Eg. Peptic ulcer where we are giving Anti H.Pylori treatment as more drugs are given in one day it will be less convenient.

Acknowledgment

I am gratified to Dr. B. M. Nagpal, Dean and CEO, MCOMS, Nepal, Dr S. M. Banerjee, Orthopaedic surgeon, Kalyani, West Bengal, India. I extend our heartfelt and cordial gratitude to Dr Akhilesh Chandra Jauhari, Professor, Department of Pharmacology, Manipal College of Medical sciences, Nepal. I am also thankful to Dr. P. Subish, Associate Professor, College of Medical Sciences (CMS), Bharatpur for teaching me the concepts of P Drug selection when I was persuing MD Pharmacology.

References

1. Banerjee I, Jauhari AC, Bista D, Johorey A C, Roy B, Sathian B. Medical Students View about the Integrated MBBS Course: A Questionnaire Based Cross-sectional Survey from a Medical College of Kathmandu Valley. Nepal Journal of Epidemiology 2011;1(3): 95-100.
2. Roy B, Banerjee I, Sathian B, Mondal M, Kumar SS, Saha CG. Attitude of Basic Science Medical Students towards Medicine and Surgery Post Graduation: A Questionnaire based Cross-sectional Study from Western Region of Nepal. Nepal Journal of Epidemiology 2010; 1(4):126-34.
3. Banerjee I, Roy B, Sathian B, Banerjee I, Kumar SS, Saha A. Medications for Anxiety: A Drug utilization study in Psychiatry Inpatients from a Tertiary Care Centre of Western Nepal. Nepal Journal of Epidemiology 2010; 1(4):119-25.
4. Banerjee I, Roy B, Banerjee I, Sathian B, Mondol M, Saha A. Depression and its cure: A Drug Utilization study from a Tertiary Care Centre of Western Nepal. Nepal Journal of Epidemiology 2010; 1(5):144-52.
5. Banerjee I, Jauhari CA, Johorey CA, Gyawali S, Saha A. Student's Accreditation of integrated Medical Education in Nepal. Asian Journal of Medical Sciences 2011;2 (1): 49-52.

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6. Shankar PR. Seven years' experience of P-drug selection. AMJ.2011, 4, 4, 201-204.
7. De Vries TPGM, Henning RH, Hogerzeil HV, Fresle DF (1994) Guide to good prescribing. Geneva: World Health Organization.
8. Hogerzeil HV, Barnes KI, Henning RH, Kocabasoglu YE, Moller H, Smith AJ, Summers RS, de Vries TPGM (2001) Teachers' guide to good prescribing. Geneva: World Health Organization
9. Shankar PR, Palaian S, Gyawali S, Mishra P, Mohan L.Personal drug selection: Problem based learning in Pharmacology: Experiences from a medical school in Nepal. PLoS One 2007; 2: e524. www.plosone.org/article/info:doi/10.1371/journal.pone.0000524
10. Banerjee I. Jauhari AC. Classification of Drugs- At a Glance. 1st Ed. Kathmandu: Nirvana Publishers, 2012.
11. Kafle KK, Prasad RR, Thapa BB. National List of Essential Medicine (forth revision draft). Nepalese National Formulary. 2nd ed. Kathmandu, 2010, pp 195.

Article Information	
Article history	
Received	**1 August 2012**
Received in revised form	**10 December 2012**
Accepted	**15 January 2013**