Concepts of P Drug Selection

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Editorial

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

Keywords: Personal Drug, Pharmacology
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**

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**

1. A score between 0-1 is given for 4 criterias of Efficacy, Safety, Cost & Convenience/Suitability. 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 bacteria namely E.coli, Klebsiella, Pseudomonas etc. which is characterized by burning micturation, fever, chills etc.

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

**Step 3:** List the classification of drugs

**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.

**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.

**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.

| Table 1: Tabulation of Group of drugs and the criterias of Efficacy, Safety, Cost, and Convenience/Suitability |
|---|---|---|---|---|
| Groups Of Drugs | Efficacy | Safety | Cost | Total |
| (0.5) | (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 | 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.
The drug which is chosen 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 discoulouration of teeth , temporary suppression of bone growth
e. Chloramphenical: 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
Penicilliing, 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 cephalosprins 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.

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.

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References


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