

Pharmacoeconomics : The need to sensitize undergraduate medical students

'Doctors prescribe, patients consume and, increasingly throughout the world, third (purchasing) parties (Govt. Insurances company) pay the bill with money they have obtained from increasingly reluctant healthy members of the public'.^[1]

"Pharmacoeconomics identifies, measures, and compares the costs and consequences of pharmaceutical products and services"^[2] and describes the economic relationship involving drug research, drug production distribution, storage, pricing and use by the people. It runs through the thread of our socioeconomic system, which regulates and influences all the sectors involved in pharmaceuticals. The production cost of drugs include research, marketing, distribution, storage etc. and this money is funneled back to the manufacturer from the consumer – the patient. *"The estimates for the development of NCE (New Chemical Entity) in India is often quoted at US \$ 90 - 100 million due to lower input costs. For every 10,000 NCE in discovery ten enter preclinical development, five enter human trials and only one may be approved."*^[3] Hence the large amount of money spent on pursuing a useless chemical entity is also borne by the consumer.

The revised undergraduate medical curriculum stresses on the importance of the essential drugs concept and the need for students to be able to prescribe drugs tailored to individual needs based on efficacy, safety, suitability and cost.^[4] Therefore students should be sensitized during their undergraduate course to consider the cost of the medicines they would be prescribing. Unfortunately, the issue of pricing is a complex one and is not very relevant to UG medical students. In our country, the same drug can be sold for various prices with costs varying from a few paise to multiples of a particular price depending on whether the drug is sold under its generic or brand name (see page no. 336), whether it is bought by its minimum retail price or by tender or rate contract and whether it is procured directly from the company or through its distributors. In 1979, 80-85% of the drugs in the market were under price control. With successive policies the number diminished and by 2002 only 25 drugs, a mere 15-20% of the market is under price control. Therefore drug prices are quickly spinning out of reach of the common man.

How best can we teach pharmacoeconomics to students? The most obvious and easy way is to build this aspect into the theory lectures. As the teacher completes each class of drugs it would be a good idea to discuss individual costs as well as total cost of therapy for a condition. While discussing long term treatment of disorders such as hypertension, bronchial asthma it would be a good idea to calculate cost for a month.

For e.g., during a class on antiepileptic drugs it would be a good idea to show a table with cost comparison of each of the older drugs as well as the newer agents. Then students could be asked to calculate the cost of therapy for a month and consider the implications of a daily wage earner buying valproate versus phenytoin for prevention of generalized tonic clonic convulsions.

Pharmacoeconomics could also be introduced as a practical lesson, wherein students could be taught to use CIMS or MIMS for selecting the cheapest available formulation of a particular drug. In this context, students would come to realize the enormous difference in cost of the newer agents compared to the older drugs. However, teachers could also point out that a long acting newly introduced drug, by virtue of being given once or twice a day may ultimately end up being cheaper than the shorter acting older counterpart. For example, therapy with azithromycin or roxithromycin has become cheaper than with erythromycin due to its smaller dosage and less frequent dosing pattern. Examples such as these can give students an insight into the complexities of pricing.

An integrated teaching session with microbiology, pathology and pharmacy will show students that investigations are also expensive and that the combined cost of investigations (usually done as a "routine") and medicines may be much more than what patients' can afford. The pharmacy department should point out the cost difference when buying drugs under rate contract in bulk. An exercise on ABC and VED (vital/essential/desirable) criticality analysis^[5] may bring out this point effectively. Teachers can use actual lists of drugs procured by the pharmacy and get the students to work it out themselves. Such an exercise would serve as a trigger in driving home the importance of pharmacoeconomics.

Students have been known to pay attention to a subject only if it is included in the examination. Unless pharmacoeconomics is also assessed, either in the formative or in the summative examination, students will not give this important aspect of pharmacology the attention it deserves. Thus, exercises should be included in the practical exams on this aspect. Many medical colleges have tried to include exercises in pharmacoeconomics in the university examinations too. However, the exercises are mere problems in addition and do not reflect the complexity of this issue. In fact, simply asking students to work out the total cost of two or more given treatment regimes and asking them to state which of them is more cost effective trivializes the whole issue. Teachers of pharmacology should attempt a more broad based approach to pharmacoeconomics and include problems such

as selecting a fixed dose formulation when the sum of individual drugs would be costlier than the combination, include the cost of devices for inhalers/rotahalers when calculating cost of bronchodilator therapy or ask students to work out how much it would cost a diabetic receiving insulin to buy insulin syringes and at times even pay a nurse or doctor to administer the injection. Additional items like cotton and spirit to clean the injection site adds to the cost of what the patient finally has to pay, or, as in the case of a government hospital, what it would cost the exchequer. Students will slowly come to realise that every drug has a price, either direct or indirect which is borne by the patient. As prescribers, they will come to realize the awesome responsibility invested in them and the need to make sound judgements when selecting drugs based on efficacy, safety, suitability and cost. Only then our mandate as teachers will be fulfilled.

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