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Full Length Research Paper

Introducing pharmacoeconomics (PE) in medical undergraduate curriculum

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Increasing health care cost is a major concern in developing world. Patients are affected by the high pricing of drugs and though the symptoms improve the poor patient compliance sets in if the regimen is heavy on the pocket of the patient. Therefore, concept of Pharmacoeconomics are essential for physicians to prescribe individualized drug therapy based on essential drug concept, STEP as well as rational utilization of drug(R.U.D.) criteria, with minimal costs to improve the cost-effectiveness of the drug therapy. Sensitizing medical undergraduates on pharmacoeconomics during second year training will inculcate the habit of prescribing cost effective medicine and cost consideration throughout their medical career and will decrease the monitory burden on the patient and the society. A module on PE was prepared and implemented in tertiary medical hospital for second year medical undergraduates. Information on essential drug concept and on PE was given to the second year medical undergraduates by organizing didactic lectures. In practical session individual cost, total cost of prescription was discussed by giving exercise on simulated case history with drug therapy. Students performance on the pharmacoeconomics was assessed by pre and post project questionnaire. Statistical analysis shows significant differences between pre and post project questionnaire. This show that second year MBBS students sensitized for Pharmacoeconomics can consider the cost of a drugs while prescription writing in future. Exercise shows successful sensitization of students on PE. Thus PE can be introduced in second year pharmacology curriculum for cost consideration of drugs and total cost of prescription while prescription writing for the patient.

Key words: Medical curriculum, suitability, tolerance, efficacy and price of the drug (STEP), rational utilization of drug (RUD), pharmacoeconomics.

INTRODUCTION

There is a growing concern over the quality of medical education for undergraduates in India. The battle against rapid population growth, wide spectrum of disease and ill health will have to be fought not merely in hospitals, urban slums and villages, but also in class rooms, laboratories, fields and diverse educational settings, which constitute the training ground for future medical manpower (Kacker, 1993). The National Health Policy (1983) emphasizes that the effective delivery of health care services depend very largely on the nature of education, training and appropriate orientation towards community health of all categories (Kacker, 1993).

However, against the background of heavy patient-care work load in the hospital, traditional pattern of education, the departmental set-up and mounting pressure on financial resources, medical educators and planners are facing the toughest challenges to revitalize the education program (Kacker, 1993). Thus medical education is not only a purely technical knowledge about diseases and their treatment but also involves understanding of socio-economic issues (Supe, 2004). Nowadays increasing health care cost is a major concern in the developing countries. Patients are affected by high pricing of drugs as drug, a “decisive technology” constitute 20 - 60% of total health care expenditure in developing countries

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(Kacker, 1993). Since 1961, pharmaceuticals are fallen under price regulation in India. A total of 343 drugs-accounting for 85% of the drug market - were under price control in 1979 (Godwin, 2007). With successive polices, the number diminished and now a mere 15 - 20% of the drug market is under price control (Editorial. 2003). In a developing country like India, 85% of total health expenditure is financed by house-hold out-of-pocket expenditure (Godwin, 2006). A substantial portion of the private health care spending goes toward cost of medicines and per capita private drug spending in India is estimated as US $ 16 (Able smith, 1994). Thus, expenditure on drugs imposes a major financial burden on households, especially when it is met from out-of-pocket expenditure due to total lack of health insurance and risk protection (Editorial, 2003). Medicines form a small but significant proportion of total health care cost (Cook, 2003). Cost of medicines is growing constantly as new medicines are marketed. The writing of a prescription is the most common therapeutic intervention in medicine. But consumption decisions in health care system are taken by provider that is physician and not by the consumer patient. Hence, due to availability of scarce resources, the responsibility of the physician is much more (Supe, 2004).

There are instances when people go without drugs, by extension without treatment, or buy a small proportion of the required doses of drugs due to high prices. If left untreated or partially treated, the disease can become aggravated resulting in death or disability. On the other hand, self medication taken by patient without consultation of physician is another possibility, result in inappropriate dosage therapy, inducing the hazardous side effects. So medicine prices do matter. (Jana and Mandal, 2005)

Need and rational

In the existing curriculum of pharmacology for medical undergraduate, the students are taught the various drug therapies and prescription writing by rote. The disadvantage of this is that the students are not exposed to the cost effectiveness of the treatment and the economic reality of the prescription and drug therapies. This may result in prescribing costly drugs or brands in prescription leading to incomplete drug treatment, poor patient compliance resulting in increased morbidity and mortality rate. Under such background, pharmaco-economics (PE) plays vital role in the treatment of diseases, as it deals with both cost and consequences of therapeutic decision making (Cooke, 2003). As undergraduate medical students are future prescribers, it is necessary to inculcate the habit of prescribing medicine according to the principle of pharmacoeconomics and ESPS data (Efficacy, Suitability, Price and Safety). Hence medical undergraduates should be sensitized towards the concept of PE during their formative years. This will help them to gain the knowledge of cost consideration of therapy and will develop good prescription habits in their career.

Objectives of the study

The project was designed to meet the following objectives which were divided into three phases.

Initial

To inculcate the principle of Pharmacoeconomics (PE) in medical students

Intermediate

1) To make the students conversant to literature on PE.
2) To make the students aware of cost consideration of drug therapy.
3) To stimulate to write rational drug therapy according to PE for common diseases.

Long term

To inculcate the principle of:

1) Rational utilization of drugs for common diseases.
2) To decrease the cost of the drug therapy.
3) Finally contributing to society benefit.

This study was carried out in Pharmacology department of M.G.M. Medical College Sector 18, Kamothe, Navi Mumbai-410209 Maharashtra (India). Second year medical undergraduates were involved in this project.

MATERIAL AND METHODS

After taking the permission from the Dean of the college and Head of the Department of Pharmacology, IEC approval was taken. Second year MBBS (2006 - 2007 Batch of 80) were informed regarding the project and its purpose orally. A group of interested staff members was formed who helped in preparation and implementation of module on PE as well as pre and post project questionnaires. Inform consent was taken from students who were willing to participate in the study. Pre-validated questionnaire on the PE were given to them to assess their awareness and knowledge on the topic. A pre-validated module on PE was prepared by taking expert opinions from the faculty. It includes terminologies used in PE like Direct cost, Indirect cost, Intangible cost, Total cost of prescription, Methods of PE analysis like Cost minimization, Cost benefit, Cost effective and Cost utility, Limiting factors for PE analysis and various proposed ways to overcome it. This module was implemented in tertiary medical hospital for second year medical undergraduates. A series of lectures was organized to disseminate the knowledge on PE for the medical undergraduate students.

Information on essential drug concept, generic vs proprietary preparations, information on cost of drugs and marketed brands was also given by organizing didactic lectures and providing informative material to them. Same Pre-validated questionnaire was again ad-

Table 1. Comparative study of the mean, standard deviation and standard error of pre and post project knowledge of the medical undergraduates.

	Test	Mean	N	Std. deviation	Std. error mean
Pair 1	Post project MCQ	8.70	54	1.11	.15
	Pre project MCQ	4.1111	54	1.8901	.2572
Pair 2	Post project SAQ	12.20	54	2.48	.34
	Pre project SAQ	4.1574	54	2.2899	.3116
Pair 3	Post project total	20.91	54	3.07	.42
	Pre project total	8.2685	54	3.4651	.4715

Table 2. Comparative data of students' Paired 't' test and probability.

Pair	Post project test vs pre project test	t	df	Sig. (2-tailed) P-value
Pair 1	Post project MCQ Vs pre project MCQ	16.306*	53	0.000
Pair 2	Post project SAQ Vs pre project SAQ	18.353*	53	0.000
Pair 3	Post project total Vs pre project total	22.205*	53	0.000

*Highly statistically significant at 5% level that is, $P < 0.05$.

ministered to them to check improvement in their knowledge after completion of series of lectures on PE. In practical session, the individual cost of drug, direct cost, indirect cost and total cost of prescription were discussed by giving exercise on simulated case history and drug therapy. Exercises for calculation of total cost of drug therapy and finding out of an economical brand from list of marketed preparations were given to them. A group discussion consisting of a group of 12 participating students in each group was arranged to comment on given simulated prescriptions, to assess the incremental analysis for drug therapy and quality adjusted life years (QALY). Student's performance on the practical implications of PE was assessed by subjecting them to pre-validated post project questionnaire. Paired Student's' test was used to compare the data obtained. Statistically significant differences between pre and post project data show the successful sensitization of students on PE.

RESULT

The result is obtained by comparing post and pre test data of the project. The comparison is highly statistically significant at 5% level (that is, $P < 0.05$). The effect of project is highly appreciated and fruitful among the students (Tables 1 and 2).

DISCUSSION

The increase in public and private spending on pharmaceuticals has been one of the main drivers of rising health expenditure in many OECD (Organization for Economic Cooperation and Development) countries in recent years (OECD Guideline, 2003). Pharmaceutical spending rose by more than 70% in real terms, between 1990 and 2001 in Australia, Canada, Finland, Ireland, Sweden and the United States. Pharmaceuticals now account for more than 10% of total health spending in nearly all OECD countries. For most doctors, drug therapy is the main tool to treat the health of their patients and prescribing is the major clinical activity of the National Health Service, (NHS) (Simon Maxwell et al., 2003). There are several important pressures on all prescribers like new drug development, extending medicine into newer areas, increasing complexity of medical care, increased use of medicine in primary and secondary care, and increasing population.

Drug can offer great benefits to patients as well as can also cause great harm. Hence there is need for newly qualified doctors to have a firm grounding in the principles of safe, suitable, efficacious and cost-effective prescribing (Simon Maxwell et al., 2003). In this project, attempt was made to sensitize the medical undergraduate for principle of rational drug prescription, ESPS criteria, and essential drug concept. Post project data shows medical undergraduates were sensitized to Essential drug concept, Rational Utilization of Drug well as PE. They will consider the cost of drugs as well as cost of therapy while writing prescription in future. Though the newly qualified doctors are usually not expected to undertake high-risk practical procedures, they often prescribe powerful drugs from their first day of clinical work.

Major clinical organizations and hospitals look to medical schools to ensure that their graduates have the necessary prescription skills and knowledge of drug therapy. (Simon Maxwell 2003). The revised undergraduate medical curriculum stresses on the importance of the essential drug concept and prescription of a drug tailored to individual need based on efficacy, suitability, price and safety of drug (ESPS Criteria). So, there is a pressing need for medical graduates to be fully prepared

to take on responsibilities of prescribing and to be able to respond to continual inevitable rapid changes in therapeutics (Simon Maxwell et al., 2003).

In this project, simulated case histories along with the drug therapy were discussed in a plenary session. Students were exposed to the various facts about the prices of drugs, direct cost, indirect cost of drug therapy as well as quality adjusted life years of patients. Hence, because of the early exposure to the reality monetary burden of disease on the patient, medical undergraduates, who are future prescribers will definatly consider cost of drug as one of the prime factor in poor patient compliance. The science of PE is useful to determine proper intervention to provide cost effective therapy to the patient. Significant differences in pre and post project questionnaire indicates that awareness was developed in the participants about PE. Hence medical students, who are the future prescribers, would appreciate the cost effectiveness of drug therapy, which ultimately reduce the economic burden on the society (Kulkarni, 2009). There is a need for medical undergraduate students to be sensitized on basic concept of PE. Hence, PE should be introduced in the curriculum of medical undergraduates. It would help them to realize the enormous differences in cost of various brands available in the market and will also increase the awareness of indirect cost and intangible cost associated with the drug therapy.

Our data revealed that students become sensitized about differences in cost of various brands available in the market. The simulated prescription and task of selecting economical brand of drugs from a given list of marketed preparations help to make the students aware of economical burden on the consumers. The statistically significant differences between pre and post project questionnaire indicates successful sensitization of second year MBBS students for PE and they can consider the cost of a drug while writing prescription in future.

Conclusion

The study shows that PE can be introduced in II year pharmacology curriculum for cost consideration of drugs and total cost of the drug therapy. PE is highly relevant in the present economic scenario and introduction of this topic in undergraduate medical curriculum will help the students in formulating cost effective prescription. Thus the patient, region, nation and society as a whole can be benefited.

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