

นิพนธ์ต้นฉบับ

## Studies on the relationship of drug prescribing and diagnosis at Chulalongkorn Hospital.

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Thamree S, Tankeyoon M, Sirivongs P, Sitprijia T, Nandavan P, Itthipanichpong C, Chompootaweeep S, Witayalertpunya S, Chongtrakul P, Pavijit N, Tungphao O, Vaivatthana S, Chaiyod N, Chanutaroe W. Studies on the relationship of drug prescribing and diagnosis at Chulalongkorn Hospital. *Chula Med J* 1994 May; 38(5): 271-277

*The irrational and excessive use of drugs has been a common problem at almost every hospital in Thailand. Information about drug prescribing patterns could provide a beneficial basis for approaching and solving this problem. This study is aimed at elucidating the relationship between drugs prescribing and the diagnoses made by general practitioners working in Room No. 9 of the OPD of Chulalongkorn Hospital. We collected the OPD cards with corresponding prescriptions once weekly throughout a one-year period. From complete data on 8,173 patients obtained on 52 days it was found that 73% of the patients had been completely diagnosed and a total of 20,203 drug items were prescribed. Single drugs, drug combinations and hospital formulations were prescribed in the amounts of 73.2%, 17.1% and 9.7%, respectively. More than half (52%) of the single drugs were prescribed by generic name and 48% by trade name; 63.20% of the single drugs prescribed were contained in the National List of Essential Drugs A.D. 1992, but 41.25% of them were prescribed by trade name and 58.75% by generic name. Only 8.57% of the drug prescriptions were considered to be used inappropriately; 9.95% were prescribed questionably. Prescribing errors (31.4%) included omission, error and the use of non-standard abbreviations. The diagnoses were found to be 23.96% for disease of the cardiovascular system; 22.85% for the gastrointestinal system and 15.74% for the respiratory system. The most preferentially prescribed drugs were paracetamol, diazepam, hydrochlorothiazide and Chulalumin. It could be concluded that the problems associated with drug utilization arise primarily because of prescription writing. Ignorance, inadequate knowledge and irresponsibility on the part of the prescribers may lead to the irrational use of drugs.*

**Key words :** *Drug prescribing.*

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Received for publication. January 17, 1994.

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การใช้ยาอย่างฟุ่มเฟือยและไม่มีเหตุผลสมควรตามหลักวิชาการเป็นปัญหาสำคัญยิ่งในโรงพยาบาลเกือบทุกแห่งในประเทศไทย ข้อมูลเกี่ยวกับลักษณะการสั่งใช้ยาของแพทย์จะช่วยให้เห็นวิธีแก้ปัญหาการศึกษาที่มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ของการสั่งใช้ยากับการวินิจฉัยโรคโดยแพทย์ของห้องตรวจโรคเบอร์ 9 แผนกอายุรกรรม โรงพยาบาลจุฬาลงกรณ์ คณะผู้วิจัยได้รวบรวมบันทึกการรักษาผู้ป่วยนอกและใบสั่งยาที่คู่กันสัปดาห์ละ 1 วัน ในเวลา 1 ปี จากข้อมูลของผู้ป่วย 8,173 คนที่รวบรวมได้จาก 52 วัน พบว่าผู้ป่วย 73% ได้รับการวินิจฉัยโรคอย่างสมบูรณ์และมีการสั่งใช้ยา 20,303 รายการ เป็นยาเดี่ยว 73.2% ยาผสม 17.1% และตำรับยาของโรงพยาบาล 9.7% มีการสั่งใช้ยาเดี่ยวด้วยชื่อสามัญ 52% ชื่อการค้า 48% พบว่า 63.20% ของยาเดี่ยวที่สั่งใช้เป็นยาที่มีในบัญชียาหลักแห่งชาติ พ.ศ. 2535 แต่แพทย์สั่งโดยใช้ชื่อการค้า 41.25% และชื่อสามัญ 58.75% พบว่ามีการสั่งใช้ยาอย่างไม่เหมาะสม 8.57% และมีข้อมูลเป็นที่น่าสงสัย 9.95% ความผิดพลาดจากการเขียนใบสั่งยาได้แก่การเขียนตกหล่น เขียนคลาดเคลื่อนและการใช้ตัวย่อที่ไม่สากลรวมกัน 31.4% โรคที่มีการวินิจฉัยมากที่สุดคือโรคของระบบหัวใจและหลอดเลือด 23.96%, โรคของระบบทางเดินอาหาร 22.85% และโรคของระบบหายใจ 15.74% ยาที่มีการสั่งใช้มากที่สุดได้แก่ paracetamol, diazepam, hydrochlorothiazide และ Chulalumin ตามลำดับ อาจสรุปได้ว่าปัญหาของการใช้ยามีสาเหตุเบื้องต้นจากการเขียนใบสั่งยา การที่แพทย์ขาดความรอบคอบ ขาดความรู้ในเรื่องยาที่จะสั่งใช้ และขาดความรับผิดชอบอาจนำไปสู่การใช้ยาอย่างไม่ถูกต้อง

The cost of health care has been increasing. New drugs are continuously being developed in order to improve the efficacy and safety of treatment. There are over 20,000 drug items registered in the United States<sup>(1)</sup> and more than 29,000 drug items are registered in Thailand<sup>(2)</sup> The value of drugs consumed by Thais is estimated to be in excess of 20,000 million Bath a year; most of the drugs are imported both in the form of raw materials as well as finished products.<sup>(2)</sup> This tremendous amount of drug consumption obviously has an adverse effect on the socio-economic status of a developing country such as Thailand. The irrational and excessive use of drugs has been recognized as a major problem at almost every hospital nationwide. Not only is the problem one of high costs but it also is one that involves problems of drug resistance, abuse, dependence and drug interaction.<sup>(3)</sup> These problems need to be elucidated to determine whether the drugs prescribed by physicians are rational.

This study is aimed at determining the relationship between the drugs prescribed and the diagnoses made by general practitioners working in Room No. 9 of the Out-Patient Department of Chulalongkorn Hospital.

## Materials and methods

1. The OPD cards together with the corresponding prescriptions were collected once weekly, from Monday to Friday of each month, throughout the period of one year.

2. One investigator, a medical doctor, provided disease codes according to the International Classification of Diseases.<sup>(4)</sup>

3. Other investigators transformed the data obtained from the OPD cards and prescription into tabular form with numeric codes and made observations on each drug prescribed, as directed in a guidebook

previously developed by our group. Remarks on some details about the prescriptions were recorded as well.

4. The data were keyed into a computer and analysed in terms of range, frequency and percentage.

## Results

Complete data on 8,173 patients were collected on 52 separate days during the one-year period. The patients who ranged in age from 20 to 59 years constituted 71.27% of the total; patients aged 60 years and older accounted for 22.87%. It was found that 73.22% of the patients had been completely diagnosed, as shown in table 1.

The number of diagnoses totalled 9,612 diseases or symptoms. Diseases of the cardiovascular, the gastrointestinal and the respiratory systems, which comprised the three major health problems constituted 23.96%, 22.85% and 15.74%, respectively, of the total. For elderly patients (i.e. those 60 years or older), diseases of the cardiovascular system were clearly prominent, as shown in table 2.

A total of 20,203 drug items were prescribed, i.e. 2.48 items per prescription for all age groups; for those in the elderly group, the average was 2.74 items per prescription.

There were 14,863 items, or 73.21% of the total drugs prescribed, belonging to the single drug class. Prescriptions by generic and trade names were comparable (52.28% vs. 47.72%). Almost half (49.84%) i.e. 7,407 items, of the single drugs prescribed were contained in the "List of Essential Drugs AD 1992"; 67% of them were prescribed by their generic names. Diazepam and paracetamol were preferentially prescribed by generic name while nifedipine (Adalat) and prazosin (Minipress) were prescribed entirely by their trade names. Drug combinations and hospital formulations were prescribed

in the amount of 17.18% and 9.75%, respectively, as shown in table 3. In consideration of drug prescriptions in relation to the diagnoses made and with regard to indications, dosage, contraindications, drug interactions, form of drug etc., it was found that 1,739 items or 8.57% of the total drugs prescribed were considered to have been used inappropriately, as shown in tables 4 and 5. Of the total prescribed inappropriately, 41.35% were used unnecessarily. Most of the unnecessary drugs were vitamins, sedatives and analgesics. Drug administration, particularly the time of administration, was also a major prob-

lem, e.g. hypoglycemic agents were not prescribed for consumption prior to breakfast, diuretics were prescribed in the evening, etc. It was found that digoxin had frequently been prescribed at a dose of 0.25 mg once daily for a long period of time. Inappropriate polypharmacy was observed in many prescriptions e.g. four antihypertensive agents were prescribed for a hypertensive patient, but three of the drugs belonged to the same group, i.e. sympatholytic agents. The other 2,021 items were prescribed questionably with unknown indications. These drugs were mainly diazepam, vitamin-B complex and paracetamol among others, as shown in table 6.

**Table 1.** Number and percentage of the patients diagnosed by care-giving practitioners.

Diagnosis	No. of Patients	%
All diagnosed, DX = 1	5,984	73.22
All undiagnosed, DX = 0	1,276	15.61
Some diagnosed; some undiagnosed, DX = 1,0	913	11.17
<b>Total</b>	<b>8,173</b>	<b>100.00</b>

**Table 2.** No. and percentage of diagnoses for diseases or symptoms of various organ systems in all-age group compared with the elderly group.

Diseases or Symptoms of Organ system	All age		Age >=60	
	No. of diagnosis	%	No. of diagnosis	%
Cardiovascular system	2,303	23.96	983	41.10
Alimentary system	2,196	22.85	319	13.34
Respiratory system	1,513	15.74	321	13.42
Endocrine system	906	9.43	322	13.46
Psychiatry	573	5.96	60	2.51
Neurological system	568	5.91	73	3.05
Bone and Joint	520	5.41	127	5.31
Hematological system	352	3.66	58	2.42
KUB system	201	2.09	45	1.88
Integumentary system	90	0.94	25	1.05
Gynecology system	28	0.29	2	0.08
Miscellaneous	362	3.77	57	2.38
<b>Total</b>	<b>9,612</b>	<b>100.00</b>	<b>2,392</b>	<b>100.00</b>

**Table 3.** Number and percentage of drugs prescribed by trade name, generic name, drug combination and hospital formulation.

Naming of drug item	No of drug prescribing	%
Trade name	7,092	34.93
Generic name	7,771	38.28
Drug combinations	3,470	17.09
Hospital formulartion	1,970	9.70
<b>Total</b>	<b>20,303</b>	<b>100.00</b>

**Table 4.** Number and percentage of drug prescriptions judged to be appropriate, inappropriate and questionable.

Classification	No. of drug prescribing	%
Appropriate	16,543	81.48
Inappropriate	1,739	8.57
Questionable	2,021	9.95
<b>Total</b>	<b>20,303</b>	<b>100.00</b>

**Table 5.** Number and percentage of various inappropriate uses of drugs.

Type	No. of drug prescribing	%
Overdose	0	0.00
Contraindication	20	1.15
Drug interaction	22	1.26
Unnecessary	719	41.35
Insufficient dose	30	1.73
Duration of therapy	17	0.98
Route and time of drug administration	629	36.17
Inappropriate form of drug	2	0.11
Others	300	17.25
<b>Total</b>	<b>1,739</b>	<b>100.00</b>

Table 6. Number and percentage of drugs prescribed questionably.

Ranking	Drug Code	Drug name	No. of drug prescribing	%
1	2403	Diazepam	262	12.97
2	6406	Vitamin-B complex	213	10.54
3	2112	Paracetamol	147	7.27
4	6701	Multivitamin	143	7.07
5	6405	Vitamin-B1-6-12	95	4.70
6	2410	Clorazepate	51	2.52
7	.038	Chulalumin	42	2.08
8	3832	Amoxycillin	36	1.78
9	3831	Ampicillin	33	1.63
9	7102	Ferrous + B + Calcium	33	1.63
10	-	Others (152 drugs)	966	47.8
<b>Total</b>			<b>2021</b>	<b>100.00</b>

In terms of completeness and correctness for each drug item prescribed, it was found that 68.69% of the total number of drugs were prescribed completely and the other 31.31% were prescribed with omissions, errors and the use of non-universal abbreviations. Examples of omission included failure to specify the strength of drug dosage, form of drug, and details of the label, among others. Errors were caused mainly by poor hand-writing and incorrect spell-

ing. Non-universal abbreviations commonly used included DZP for diazepam, CPM for chlorpheniramine, MTV for multivitamin, and para for paracetamol.

With regard to expense, it was found that the average cost per prescription was 160.56 Baht, with the three highest costs per disease or symptom being as follows : 743.24 Baht for hyperlipidemia, 699.16 Baht for myocardial infarction and 656.73 Baht for asymptomatic hyperuricemia.

Table 7. Number and percentage of completeness and errors in writing prescriptions.

Prescriptions	No. of drugs prescribed	%
Complete	13,927	68.69
Omission	5,676	27.96
Error	286	1.41
Wrong or non-standard abbreviation	414	2.04
<b>Total</b>	<b>20,303</b>	<b>100.00</b>

## Discussion

The results of this study confirm that there are problems with drug utilization arising primarily from prescription writing. Some practitioners are not fully familiar with the rational use of drugs in terms of their indications, efficacy, safety and afford ability. Single drugs and drug combinations were prescribed predominantly by trade name; such drugs are more expensive than generic drugs. The use of drug combinations may involve the unnecessary use of some drugs in the prescription. The lack of knowledge about the drugs being prescribed may lead to the inappropriate use of drugs, particularly inappropriate drug administration. These factors are responsible for the adverse effects of drugs as well as the ineffectiveness of certain drug therapies. The ignorance and carelessness of some practitioners are commonly reflected in the prescriptions they write. Mistakes range from omission and errors to the use of non-university abbreviations. Prescription errors may be hazardous to the patients and result in a waste of their time in consulting doctors to have the prescription corrected. It is believed that a number of patients may suffer from a new illness, i.e. the so-called 'iatrogenic disease'; Moreover, since those prescribing the drugs may not have the opportunity to learn from their mistakes, it is necessary to remind them of the importance of being aware of the need for making rational drug prescriptions.

## Acknowledgement

The authors gratefully acknowledge the support provided for this study by the Rachadapiseksompoj China Medical Board Research Fund.

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