

Top 200 Prescribed Drugs Mostly Prescribed by the Physician in Pharmacies at Medan City

H R Tanjung* and E S Nasution

Pharmacology and Toxicology Department, Faculty of Pharmacy, University of Sumatera Utara, Jl. Tridharma No.5, Kampus USU Medan 20155

*harri@usu.ac.id

Abstract. The drug information literatures usually contains thousands of drugs, which much of them were rare or never prescribed by the physicians. It caused pharmacy students must learn thousands of drugs that will depleted resources and the study result was not effective. The aim of the study was to identify 200 items of drugs that mostly prescribed by the physicians in the pharmacies at Medan City. The study was a descriptive study that used a cross sectional survey methodology. The 200 items of drugs that mostly prescribed by the physician obtained from the pharmacies selected regarding to random sampling method. The study was conducted from August to September 2016. The 200 items of drugs that mostly prescribed by the physician resulted from 21.962 prescribed drugs item of 16.352 prescriptions of 100 pharmacies. The list revealed that the most prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), and ciprofloxacin (2.97%). It shows that the antibiotic drug was the most prescribed drug by the physician in pharmacies at Medan City. Further studies are required to develop the study card from the list.

1. Introduction

The Pharmaceutical care concept implementation was changed pharmacy practice around the world. The pharmacist role was not only responsible for product oriented but also to identify, manage and prevent the patient's drug related problems [1]. Furthermore, the pharmacy education in the world has been changed in order to adopt the pharmaceutical care concepts. A pharmacy student required to learn more on knowledge and clinical skills i.e. pharmacology, pharmacotherapy, clinical pharmacy, drug management, psychology and communication, health promotion and disease prevention. The pharmacy student also must familiar with prescribed drug in order to deliver the pharmaceutical care services in community pharmacy setting [2] [3].

The drug information literatures usually contains thousands of drugs, which much of them were rare or never prescribed by the physicians. It caused pharmacy students must learn thousands of drugs that will depleted resources and the study result was not effective. This condition revealed that the pharmacy student and pharmacist need the drug information literature contains information of prescribed drug that utilized in pharmaceutical practice daily. The pharmacy students and pharmacists will able to learn effectively by the availability of this drug information literature.



Some countries have been developed the top 200 prescribed drugs mostly prescribed and have been evaluated to the list continuously. The United States developed the Pill Book [4] contain of 200 prescribed drugs mostly prescribed consumed by the community since 1984. The 200 prescribed drugs mostly prescribed in United State and other countries can be accessed through Intercontinental Marketing Services data base [5]. The 200 prescribed drugs mostly prescribed concept also has been accepted in North America extensively [6]. The University of Missouri-Kansas City (UMKC) also obligated the second and third year pharmacy student to pass a 50-multiple choice examination of the top 200 most frequently prescribed drug. This test aims to ensure that the pharmacy students have developed the knowledge base as the requirement to the later courses [7]. Therefore, the 200 mostly prescribed drugs were considered as a list that must learn by pharmacy students in order to implement the pharmaceutical care services effectively.

Recently, the 200 prescribed drugs that available was based on drug utilization in foreign countries and the list was not exactly similar with the drugs utilization in Indonesia. Based on the researcher tracer study, there is no 200 prescribed drugs list obtained from drugs utilization in Indonesia. This study aim to identify 200 prescribed drugs that mostly prescribed by physician in community pharmacies at Medan city. The top 200 prescribed drugs list obtained from this research will develop into a drug information literature in the further study.

2. Method

This study was a descriptive research that used a cross sectional survey methodology. The 200 prescribed drugs list obtained from the physician's prescription retrospectively by direct survey to the selected community pharmacy at Medan City. The selection of community pharmacy was done by random sampling method. The study was conducted on August to September 2016.

Based on the health department of Medan City data, there are 617 (N) pharmacies at Medan City. The number of sample (n) was calculated by Slovin formula: $n = N / (1 + N e^2)$ [8]. The study used 0.1 as error tolerance (e) and it was obtained 86 pharmacies as a minimum sample amount. The researcher added the sample amount to 100 pharmacies. The selected pharmacies located at 16 district area of 21 district area of Medan City.

The study assessed the two month of prescribed drug utilization in year of 2016 for every selected pharmacies. The study excluded non-prescribed drugs, vitamin and mineral supplements, vaccines and antisera, biopharmaceuticals and immunoglobulins from the list. The 200 drug lists were grouped and categorized with The Anatomical Therapeutic Chemical (ATC) classification system that recommended by the WHO for drug utilization studies [9].

3. Results and Discussions

3.1. Top 200 prescribed drugs

The 200 items of prescribed drugs that mostly prescribed by the physician resulted from 21.962 prescribed drugs item of 16.352 prescriptions of 100 pharmacies. The list revealed that the 10 (ten) mostly prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), ciprofloxacin (2.97%), cefadroxil (2.83%), salbutamol (2.71%), diazepam (2.69%), domperidone (2.57%) and cefixime (2.19%) as shown in Table 1. The list obtained from this study shown a big difference with the list that published recently at the United States [10].

Table 1. Top 200 prescribed drugs

No.	Drugs Name	%	No.	Drugs Name	%
1	Amoxicillin	5.55	101	Salmeterol	0.13
2	Dexametason	4.44	102	Hydrocortisone	0.13
3	Mefenamic acid	3.73	103	Fluconazole	0.12
4	Cetirizine	3.16	104	Pyrazinamide	0.12
5	Ciprofloxacin	2.97	105	Trimetazidine	0.12
6	Cefadroxil	2.83	106	Fusidic acid	0.12
7	Salbutamol	2.71	107	Lorazepam	0.12
8	Diazepam	2.69	108	Acetylcysteine	0.11
9	Domperidone	2.57	109	Diphenhydramine	0.10
10	Cefixime	2.19	110	Itraconazole	0.10
11	Ibuprofen	2.18	111	Ceftriaxone	0.10
12	Na/K diclofenac	2.16	112	Cefotaxim	0.09
13	Levofloxacin	2.11	113	Gabapentin	0.09
14	Clindamycin	2.03	114	Miconazole	0.09
15	Amlodipine	1.94	115	Propranolol	0.09
16	Methylprednisolone	1.94	116	Risperidone	0.09
17	Alprazolam	1.83	117	Baclofen	0.08
18	Ranitidine	1.69	118	Eperisone	0.08
19	Ambroxol	1.63	119	Gliclazide	0.08
20	Metampiron (Metamizole)	1.52	120	Heparin sodium	0.08
21	Cyproheptadine	1.39	121	dydrogesterone	0.08
22	Codeine	1.33	122	Erdosteine	0.08
23	Acetylsalicylic acid	1.33	123	Ethambutol	0.08
24	Metronidazole	1.10	124	Glyceril trinitrat	0.08
25	Clarithromycin	1.17	125	Noscapin	0.08
26	Meloxicam	1.14	126	Clebopride	0.07
27	Lansoprazole	1.00	127	Citicoline	0.07
28	Mecobalamine	0.99	128	Cyclophosphamide	0.07
29	Metformin	0.98	129	losartan	0.07
30	Triamcinolone	0.94	130	Clobetasol	0.06
31	Isoniazid	0.94	131	Digoxin	0.06
32	Betamethasone	0.94	132	mometasone furoate	0.06
33	Rifampicin	0.87	133	Timolol	0.06
34	Glimepiride	0.87	134	Valsartan	0.06
35	Omeprazole	0.82	135	Candesartan	0.06
36	Sulfamethoxazole and	0.81	136	Allylestrenol	0.06
37	Erythromycin	0.80	137	Fexofenadine	0.06
38	Furosemide	0.80	138	Mebendazole	0.06
39	Ramipril	0.76	139	Hydrochlorothiazide	0.06
40	Oxymetazoline	0.76	140	Cilostazol	0.05
41	Loratadine	0.76	141	Clomiphen sitrat	0.05
42	Thiamphenicol	0.49	142	Desloratadine	0.05

Table 1. Cont.

43	Doxycycline	0.67	143	Gliquidone	0.05
44	Simvastatin	0.66	144	Latanoprost	0.05
45	Chlorpromazine	0.65	145	Procaterol HCl	0.05
46	Nystatin	0.65	146	Simetidin	0.05
47	Azithromycin	0.62	147	Dapagliflozin	0.05
48	Mupirocin	0.62	148	Insulin	0.05
49	Carbamazepine	0.59	149	Isosorbide mononitrat	0.05
50	Gentamicin	0.55	150	Norfloxacin	0.05
51	Allopurinol	0.51	151	Polymyxin B	0.05
52	Captopril	0.50	152	Telmisartan	0.05
53	Prednisolone	0.50	153	Trihexyphenidyl	0.05
54	Sucralfate	0.50	154	Diltiazem	0.05
55	Tranexamic acid	0.50	155	Famotidine	0.05
56	Atorvastatin	0.50	156	Prilocain	0.05
57	Bisoprolol	0.50	157	Maprotiline HCl	0.05
58	Epinephrine	0.49	158	Methotrexate	0.05
59	Tripolidine	0.48	159	Tamsulosin	0.05
60	Aciclovir	0.46	160	Pipemidate acid	0.04
61	Ondansetron	0.42	161	Phenytoin	0.04
62	Ketoconazole	0.41	162	Irbesartan	0.04
63	Spirolactone	0.41	163	Isosorbide Dinitrat	0.04
64	Betahistine	0.40	164	Pantoprazole	0.04
65	Clopidogrel	0.40	165	Piroxicam	0.04
66	Butylscopolamine	0.36	166	Fluticasone	0.04
67	Ofloxacin	0.35	167	Terfenadine	0.04
68	Lisinopril	0.34	168	Levodopa and	0.04
69	Metoclopramide	0.32	169	Acarbose	0.04
70	Methylergometrin	0.31	170	Bromhexin	0.04
71	Phenobarbital	0.30	171	Ceftazidime	0.04
72	Glibenclamid	0.29	172	deksketoprofen	0.04
73	Isoxsuprine	0.27	173	Etoricoxib	0.04
74	Ketorolac	0.26	174	Flunarizine	0.04
75	Amitriptyline	0.26	175	Morphine	0.04
76	Celecoxib	0.25	176	Olanzapine	0.04
77	Chloramphenicol	0.25	177	Pregabalin	0.04
78	Nifedipin	0.25	178	Rabeprazole	0.04
79	Ketoprofen	0.24	179	Tinoridine	0.04
80	Loperamide	0.24	180	Tizanidine	0.04
81	Theophylline	0.24	181	Clocortolone	0.03
82	Tobramycin	0.23	182	Dextromethorphan	0.03
83	Tramadol	0.23	183	Dimethindene Maleat	0.03
84	Desoximetasone	0.23	184	Tolterodine	0.03
85	Atenolol	0.22	185	Budesonide	0.03
86	Misoprostol	0.20	186	Haloperidol	0.03

Table 1. Cont.

87	Chloroquine	0.20	187	Clobetasol	0.03
88	Lincomycin	0.18	188	Sildenafil sitrat	0.03
89	Lidocaine	0.18	189	Phenylephrin	0.03
90	Clobazam	0.18	190	Fluocinolone	0.02
91	Prednisone	0.17	191	Formoterol fumarat	0.02
92	Mebhydrolin	0.17	192	Linagliptin	0.02
93	Mesterolone	0.17	193	Moxifloxacin	0.02
94	Tetracycline	0.16	194	Oxcarbazepine	0.02
95	Warfarin	0.16	195	Piracetam	0.02
96	Valproic Acid	0.15	196	Progesterone	0.02
97	Neomycin	0.14	197	Dextran	0.02
98	Lynestrenol	0.14	198	Promethazine	0.02
99	Heptaminol	0.14	199	Asetazolamide	0.02
100	Oksomemazin	0.13	200	Clozapin	0.02

The US list revealed levothyroxine as the most prescribed drug followed by rosuvastatin, esomeprazole, salbutamol and fluticasone propionate. It shown that the lists published at foreign country were different and not suitable with the local drug utilization. As a conclusion, in order to develop a drug list as a learning tool, it is better to use a local drugs utilization data. The pharmacy students, academics staff or pharmacists may get benefit from this list, but they must remember that different areas have different prescribing patterns [2].

Pharmacy students must possess as much as possible with prescribed drug knowledge before enter the pharmaceutical practice clerk as a part of their education program in Indonesia education system. This list will enable the pharmacy student and pharmacist learn the prescribed drug information effectively because they just focus on the most utilized prescribed drugs that use daily in community pharmacy practice. The drug list also very useful for a continuing professional development program for pharmacists and build the pharmacy student's confidence before they face the real patients at the community pharmacy practice setting.

3.2. Drug utilization by Therapeutic class

The study categorized prescribed drugs by ATC classification system as shown in Table 2.

Table 2. The top 10 precribed drugs ulitization by therapeutic class (n=21.962)

No.	Therapeutic Class	Percentage
1	Antibacterial	24.60
2	Antiinflammatory and Antirheumatic	10.13
3	corticosteroids	9.49
4	Antihistamines	6.39
5	Psycholeptics	5.62
6	Drug for acid related disorder	4.40
7	Drugs for obstructive airway diseases	3.71
8	Cough and Cold preparations	3.29
9	Propulsives	2.57
10	Drugs used in Diabetes	2.42

Table 2 revealed the five most frequently drugs prescribed by physician in pharmacies based on therapeutic class was antibacterial (24.60%), antiinflammatory and antirheumatic (10.13%), corticosteroids (9.49%), antihistamines (6.39%), and psycholeptics (5.62%). It shown that antibacterial was the most frequently prescribed drug with the percentage of utilization as much as 24.60%. The five most antibacterial drugs prescribed by the physician were amoxicillin (5.55%), ciprofloxacin (2.97), cefadroxil (2.83%), cefixime (2.19%), and levofloxacin (2.11%). This antibacterial utilization (24.60%) was much higher than antibacterial utilization (7%) at UK [2]. This high utilization of antibacterial has caused some important implications. The utilization of antibacterial drugs at community pharmacy setting usually was done by empirical method. The physician determined the kind of antibacterial based on empirical experience and literature review, not based on microbiological culture test. This condition will increase the resistance risk of antibacterial utilization. The high utilization and costly forms of antibacterial are needs to be regulated closely. The utilization of some antibacterial also needs to assess whether they were prescribed appropriately or not [11].

The list showed the five most utilized prescribed drugs based on volume prescription and therapeutic class (Table 1 and Table 2) were contain of three drugs, besides amoxicillin and ciprofloxacin (antibiotics), i.e. dexametasone (4.44%), mefenamic acid (3.73%), and cetirizine (3.16%). The drugs were indicated to relieve symptomatic condition of the diseases (symptomatic therapy) but not to cure the diseases (curative therapy). Each of these drugs has some adverse drug reaction, i.e. dexametasone can cause osteoporosis, peptic ulcer, glaucoma, etc.; mefenamic acid can cause arrhythmia, palpitation, vomit/nausea, gastrointestinal perforation, ulcer peptic, etc.; and cetirizine can cause sedative, dizzy, diarrhea, vomit/nausea, cough, etc [14]. This condition has some consequences related to the drugs utility in order to use the symptomatic drugs safely. Pharmacists must counsel the patients that the symptomatic drugs should only use for short period and the patient must stop use the drugs if the symptoms were relieved in order to prevent or minimize the occur of drugs side effects.

The psycholeptics drug was the fifth most utilized prescribed drugs (5.62%) in community pharmacy practice. The percentage came from high number of prescribed items. The two most utilized psycholeptics drug was diazepam and alprazolam (80.42% of all psycholeptics drugs). Diazepam and alprazolam usually prescribed for anxiety, seizure, and insomnia indication. These drugs can cause adverse drug reaction i.e. drawziness, muscle weakness, ataxia, amnesia, depression, etc. [14] Pharmacy students and pharmacists must be aware of this drugs adverse drug reaction especially if the drugs were prescribed for long term diseases treatment. The pharmacists must encourage and prepare the patient mental condition in order to increase the patient's adherence for long term diseases treatment and prevent or minimize the adverse drug reaction events.

3.3. Drug utilization by Generic and branded name

The study categorized prescribed drugs by generic and branded name classification as shown in Table 3.

Table 3. Generic names Vs Branded names (n=21.962)

Generic Names	Branded Names
9844 (44.82%)	12.118 (55.18%)

Table 3 revealed branded names of drugs (55.18%) was more frequently prescribed by physician in pharmacies than generic name (44.82%). This generic names utilization was smaller than generic names utilization at United Kingdom (57.5%) or United States (8 in 10 prescriptions) [2] [13]. The government was promoted the generic drugs utilization from few years ago by the Law of Health Ministry No. 02/Menkes/068/I/2010 [12]. This study revealed that the generic names utilization was still low and the government needs to evaluate their program continuously.

4. Conclusions

The 200 items of drugs that mostly prescribed by the physician resulted from 21.962 prescribed drugs item of 16.352 prescriptions of 100 pharmacies. The top 200 list revealed that the most prescribed drugs was amoxicilline (5.55 %), followed by dexamethasone (4.44%), mefenamic acid (3.73%), cetirizine (3.16%), and ciprofloxacin (2.97%). The study revealed antibacterials drug as the most prescribed drug by the physician in pharmacies at Medan City. Further studies are required to develop the learning tool from the list.

Acknowledgements

The authors acknowledge that the research was supported by Rector of University of Sumatera Utara. The support is under the research grant TALENTA USU of year 2016 contract number 69/UN5.2.3.1/PPM/SP/2016.

References

- [1] Cipolle RJ, Strand LM, and Morley PC 2004 *Pharmaceutical Care Practice: The Clinician's Guide* Chapter 7 (New York: McGraw-Hills)
- [2] Winit-Watjana W, Francis D, and Ho HM 2011 Top 200 Prescribed drugs as a tool for pharmacy teaching and training *Pharmacy Education* 11 (1): 46 – 53
- [3] Jisha ML and Minaz N 2011 Understanding The Pharmaceutical Care Concept: a Review *International Research Journal of Pharmacy* Volume 2 Issued 9
- [4] Silverman HM 2008 *The pill book* (New York: Bantam)
- [5] Lamb E 2007 *Top 200 prescription drugs of 2006*. Pharmacy Times, May, 34-37
- [6] Evans C, Foushee L, and Al-Achi A 2006 Top 200 prescribed drugs learning tool and objective evaluation instruments in community pharmacy clerkship sites *Journal of the American Pharmacists Association*, 46(2), 292-293.
- [7] Santee J 2003 A web-based practice examination to improve student performance concerning the 200 most prescribed drugs *American Journal of Pharmaceutical Education* 67(4) Article 102
- [8] Umar, H. 2004. *Metode Penelitian untuk Skripsi dan Tesis Bisnis* (Jakarta: PT Raja Grafindo Persada)
- [9] WHO 2013 Guidelines for ATC classification and DDD assignment
- [10] Brooks M 2016 Top 100 most prescribed, top-selling drugs www.medscape/viewarticle/829246 retrieved 10 October 2016
- [11] Desalegn AA 2013 Assessment of Drug Use Pattern Using WHO Prescribing Indicators at Hawassa University Teaching and Referral Hospital, Soth Ethiopia: a Cross-Sectional Study *BMC Health Services Research* 13: 170 pp. 1-6 <http://www.biomedcentral.com/1472-6963/13/170>
- [12] Ministry of Health of Republic Indonesia 2010 The Law of Republic Indonesia Ministry of Health No. HK. 02/Menkes/068/I/2010
- [13] U.S. Food and Drug Administration 2016 Facts about Generic Drug <http://www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/UnderstandingGenericDrugs/ucm167991.htm>
- [14] MIMS Indonesia 2016 Drug Information <http://www.mims.com/indonesia/drug/info>