

Investigation into use of Drugs in Wrong Nervous System Indications Among Students in Chittagong city of Bangladesh: A Comparison Between Medical and Nonmedical Students

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Abstract

All kinds of drugs are available over the counter in Bangladesh. The objective of this study was to investigate the over the counter use of self-medicated drugs targeting nervous system among medical and nonmedical students. By snowball sampling method, 101 medical students and 186 nonmedical students were found who used at least one of the 9 drugs (believed as antipsychotics among nonmedical people) under survey within 6 months prior to survey date. The nine drugs used for survey were Domperidone, Sertraline, Amitriptyline, Midazolam, Diazepam, Bromazepam, Flupentixol-melitracen and Clonazepam. The symptoms, diseases etc. of the students and the length of therapies they had followed for the respective drugs were noted. Among nonmedical students, several cases were found where drugs were being self medicated in wrong indications, for example, use of flupentixol-melitracen and domperidone to treat headache. The nonmedical students chose the fast acting drugs having the strongest effects for self medication.

Introduction

Self-medication is widespread in Bangladesh (Islam N et al, 1996) and clinically inappropriate and inefficient use of medicines is a serious problem (Islam MS 2008). Incorrect use of self-medicated drugs targeting nervous system should be recognized and prohibited. Previous studies indicate that 1% of Bangladeshi students suffered from mental stress and 6% of students habitually keep hypnotic/sedatives as home medicine

(Chowdhury N et al, 2009) . The present study was carried out on self-medication rate of self medicated drugs targeting nervous system drugs among educated and adult people. The present study aimed at making a comparison between the self-medication rates of the medical versus nonmedical students in Chittagong city of Bangladesh.

A study on self-medication rate of drugs used for targeting nervous system is necessary to utilize the urban health-care benefits, to keep health care appraised, to advise the authority of health-care options, and to arrange for appropriate level of public health care. The objective of this study was to investigate the patterns of use of drugs popularly targeted for nervous system and medication knowledge, including both prescription and non-prescription drugs, and to assess the possible predictors of self-medication, for general educated population of Bangladesh.

Methods

The study was conducted among the students from a medical college (Chittagong Medical College), few non-medical colleges and universities (Chittagong College, Chittagong University) situated at Chittagong city in Bangladesh during July-September 2009. Using simple random sampling technique, 302 medical students and 863 nonmedical students were asked if they used any of the drugs listed in the questionnaire. 101 medical students and 186 nonmedical students who used at least one of the 9 drugs (popularly self medicated drugs for nervous system) under survey within 6 months prior to survey date were given the questionnaire for filling up. The nine drugs used for survey were domperidone, sertraline, amitriptyline, midazolam, diazepam, bromazepam, flupentixol-melitracen, and clonazepam. Data, such as symptoms, and diseases of the students, including the length of therapies they had followed for the respective drugs, were noted. Structured questionnaire was used in the survey. Trained seventh semester Pharmacy students from State University of Bangladesh collected data through conducting direct dialogue/interview with the sampled students.

Supervisors in the field regularly reviewed questionnaires. Field researchers double-checked the responses at the field immediately after conducting interviews. Supervisors directly observed 5% cases during the interview conducted by field workers. Information from the written questionnaires was entered into an electronic database.

The drug brands were selected after careful consultation with the product managers of reputed pharmaceutical companies, IMS Health report, and others. The names of the brands have not been disclosed in this study, except in the original questionnaire used.

Data analysis

The data thus gathered were analyzed using SPSS software version 13.0. The trends in population characteristics across explanatory variables (e.g., self-medication rate, target diseases for self-medication) were assessed using Pearson's chi-square test for categorical variables and simple linear regression for continuous variables. The analysis was exploratory.

Ethics

Because the names of the brands from different pharmaceutical companies have not been disclosed, the analysis was done on the basis of generics. The Department of Pharmacy, State University of Bangladesh, which has been granted the accreditation of the Pharmacy Council, Bangladesh, and University Grants Commission, Bangladesh, reviewed and approved the study.

Findings

From Table 1

Domperidone

More than 50% of both medical and nonmedical students self-medicated with domperidone. Students of both categories mostly used this drug for curing headache. However, some of the nonmedical students used domperidone for the cure of migraine and nausea/vomiting.

Bromazepam

More than 88% of both medical and nonmedical students self-medicated with bromazepam. Bromazepam was common for both categories of students for the purpose of treating anxiety. However, medical students mainly self-medicated with bromazepam to cure insomnia, but the nonmedical students self-medicated with bromazepam to cure depression.

Amitriptyline

Higher proportion of nonmedical students (70%, relative risk [RR] = 0.48) self-medicated with amitriptyline mainly for the purpose of treating headache. However, the difference was not significant because of lower number of sample size. Medical students used amitriptyline to cure headache, with a higher rate compared with nonmedical students (RR = 3.0, $p < 0.05$).

Midazolam

Although comparatively higher proportion (70%, RR = 2.0) of medical students self-medicated with midazolam compared with nonmedical students, the difference was not significant because of the lower number of sample coverage. Medical students used midazolam to cure insomnia (RR = 6.0, $p < 0.05$). However, nonmedical students used midazolam to cure both insomnia and anxiety.

Diazepam

More than 61% of students used diazepam to cure insomnia and anxiety. Significantly higher proportion (RR = 2.4, $p < 0.05$) of medical students used diazepam against insomnia, and higher proportion of nonmedical students used this drug against anxiety.

Flupentixol-melitracen

Almost half of the students used flupentixol-melitracen mainly against depression. However, medical students and nonmedical students also utilized this drug against anxiety and headache, respectively.

Clonazepam

More than two thirds of the students self-medicated with clonazepam to cure insomnia and anxiety. Nonmedical students were found to use this drug against depression.

Sertraline: Medical students were found to use sertraline against depression.

Chlorperazine: Nonmedical students were found to self-medicate with this drug to cure insomnia.

Table 1: Use of drug as self medications by medical and nonmedical students

Indicators	Medical % (N)	Nonmedical % (N)	Relative risk (RR) (95% CI)	p-value*
Domperidone—self-medication	50 (12)	62 (16)	0.79 (0.4, 1.4)	ns
Domperidone—self-medicated for				
Headache	0	37.5	3.0 (1.6, 5.8)	-
Migraine	0	25	-	-
Nausea and vomiting	100	37.5	-	0.001
Bromazepam—self-medication	89 (8)	88 (14)	1.0 (0.4, 2.5)	ns
Bromazepam—self-medication for				
Insomnia	75	-	-	-
Nightmare	12.5	-	-	-
Anxiety	12.5	7	1.3 (0.3, 5.4)	ns
Depression	-	93	-	-
Amitriptyline—self-medication	29 (2)	70 (7)	0.48 (0.18, 1.26)	ns
Amitriptyline—self-medication for				
Anxiety	100	14	3.0 (0.6, 14.9)	0.023
Headache	-	71	-	-
Depression	-	14	-	-
Midazolam—self medication	70 (5)	33 (3)	2.0 (0.7, 5.3)	ns
Midazolam—self medication for-				
Insomnia	100	33	6.0 (1.0, 35.9)	0.035
Anxiety and others	-	67	-	-
Diazepam—self-medication	67 (12)	61 (14)	1.1 (0.6, 1.9)	ns
Diazepam—self-medication for-				
Insomnia	83	36	2.4 (1.1, 5.3)	0.014
Anxiety	17	43	0.59 (0.3, 1.1)	ns
Muscle relaxation	-	21	-	-
Flupentixol-melitracen—self-medication	50 (6)	43 (9)	1.1 (0.7, 1.9)	ns
Flupentixol-melitracen—self-medication for				
Depression	67	78	0.79 (0.3, 2.3)	ns
Anxiety	33	-	-	-
Headache	-	22	-	-
Clonazepam—self-medication	67 (4)	76 (52)	0.96 (0.8, 1.1)	ns
Clonazepam—self-medication for				
Insomnia	75	69	1.0 (0.9, 1.2)	ns
Anxiety	25	8	1.2 (0.8, 1.8)	ns
Depression	-	23	-	-
Sertraline—self-medication	100 (1)	0	-	-
Sertraline—self-medication for depression	100	-	-	-
Chlorperazine—self-medication	-	50 (1)	-	-
Chlorperazine—self-medication for insomnia	-	100	-	-

Among medical students, comparatively higher proportions of medical students self-medicated by taking domperidone for headache, diazepam for insomnia, bromazepam for insomnia, and midazolam for insomnia. Among nonmedical students, comparatively higher proportion of students self-medicated by taking clonazepam for insomnia, prochlorperazine for nausea and vomit, bromazepam for depression, and clonazepam for depression.

Using flupentixol-melitracen for depression, diazepam for anxiety, and prochlorperazine for migraine is almost similar for both medical and nonmedical students.

Only nonmedical students used amitriptyline, domperidone and flupentixol-melitracen for headache,

bromazepam and clonazepam for depression. Again, only medical students used sertraline for depression, flupentixol-melitracen for anxiety, and bromazepam for insomnia.

Table 2. Nonmedical self-medication rate from the present study versus medicine acquaintance rate from a previous study¹³

Serial	Drug	Nonmedical self-medication rate (%)	Medicine acquaintance rate (%)	Asymptotic significance (2-sided) (self-medication rate vs acquaintance rate of first 6 drugs)	Asymptotic significance (2-sided) (self-medication rate vs acquaintance rate of all 9 drugs)
1	Domperidone	62.00	69.87	0.014	0.284
2	Amitriptyline	70.00	57.85		
3	Diazepam	61.00	54.18		
4	Flupentixol-melitracen	43.00	24.69		
5	Clonazepam	76.00	47.28		
6	Prochlorperazine	90.00	49.37		
7	Clonazepam	76.00	47.28		
8	Midazolam	33.00	31.49		
9	Bromazepam	88.00	22.80		

In Table 2, the self-medication rate of the popularly self medicated drugs for nervous system and their acquaintance rate among another Bangladesh population sample established by a previous study has been compared. There is a significant correlation between nonmedical self-medication and acquaintance rate for domperidone, amitriptyline, diazepam, flupentixol-melitracen, clonazepam, and prochlorperazine. However, there is no asymptotic significance when clonazepam, bromazepam, and midazolam also are included in the correlation analysis.

Discussion

Bromazepam is indicated for symptomatic relief of tension, anxiety, and agitation. None of the medical students self-medicated with bromazepam for depression, but 93% of the nonmedical students did. Bromazepam may increase depression in some patients. Therefore, bromazepam is not recommended as primary therapy in patients with depression, anxiety, and/or psychosis (Product Information Sheet, Roche; Guelfi JD et al, 1993).

One hundred percent of the medical students who self-medicated with amitriptyline took amitriptyline to relieve anxiety, whereas majority (71%) of nonmedical students self-medicated with amitriptyline for treating headache. Amitriptyline is the most widely researched prophylactic agent for frequent headaches. Numerous scientific studies and reviews recommended prophylactic use of amitriptyline in tension headaches (Millea PJ et al, 2002; Castells ET et al, 2008). In this study, the data on the type of headache for which amitriptyline was used is not available. However, the use of amitriptyline in depression and anxiety has been recommended (International Narcotics Control Board). About 7% of the nonmedical students self-medicated with amitriptyline for depression.

One hundred percent of the medical students and 33% of the nonmedical students self-medicated with midazolam for insomnia, and 67% of the nonmedical students self-medicated with midazolam for anxiety. Studies justify the use of midazolam for insomnia or anxiety (Pubchem, 2006), but midazolam is a schedule III substance defined by the International Narcotics Control Board. Abuse of midazolam may lead to moderate or low physical dependence or high psychological dependence. Therefore, public self-medication of midazolam should not be allowed.

Diazepam is an anticonvulsant, anxiolytic, sedative, and muscle relaxant (Pubchem, 2006). The medical students self-medicated with diazepam for relieving insomnia and anxiety. The nonmedical students self-medicated with diazepam for relieving insomnia and anxiety and for muscle relaxation.

Flupentixol-melitracen is a combination of two psycho-active agents, which has antidepressant properties. This drug should be taken within bounds if allowed by a specialist. It has been reported in the media that the Indian government is considering to ban the sale of this drug because the combination drug is banned for use in the country of its origin, Denmark. The US Food and Drug Administration and drug authorities in UK, Canada, Australia, or Japan have not approved this drug either (Indian Pharmacist Association). In the present study, medical students self-medicated with this drug for depression and anxiety. Nonmedical students used the flupentixol-melitracen combination for both depression and headache. However, there is no document available that flupentixol-melitracen could be used for headache.

Sertraline was not used for self-medication by any nonmedical student. Only one medical student who self-medicated with sertraline was found. In that one instance, sertraline was used for depression. Sertraline's acquaintance rate within another sample of Bangladesh population was found to be 27.62% ((N. Chowdhury et al 2011)) .

Clonazepam was used by medical students to relieve insomnia and anxiety. Nonmedical students self-medicated with clonazepam for insomnia, anxiety, and depression. The use of clonazepam in insomnia, anxiety, and depression has been documented (FDA prescription insert; Oshtory MA et al, 1980).

Both medical nonmedical students self-medicated with prochlorperazine for migraine and nausea/vomiting.

There is a significant correlation between nonmedical self-medication and acquaintance rate for domperidone, amitriptyline, diazepam, flupentixol-melitracen, clonazepam, and prochlorperazine. However, for clonazepam, bromazepam, and midazolam, significant correlation was not found. There are 246 licensed pharmaceutical factories in Bangladesh, six of them are owned by multinational companies producing about 10.4% of the local production (Banglapedia 2003) . The share of clonazepam, bromazepam, and midazolam is marketed by multinational company having only 15 distribution bases through out the country. On the other hand, the local companies reach the grassroots level of each part of Bangladesh with 18 or more distribution bases, and share of all the nine drugs under the present study are marketed by local companies. Therefore, further studies should be carried out for these three drugs clonazepam, bromazepam, and midazolam.

Among nonmedical students, several cases were found where drugs were being self medicated in wrong indications, for example, use of flupentixol-melitracen and domperidone to treat headache. The nonmedical students chose the fast acting drugs having the strongest effects for self medication. The antipsychotics should have prescription-only status in Bangladesh. Mandatory counseling of each customer purchasing drugs from retail drug stores should be introduced.

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