ORIGINAL ARTICLE

Assessment of prescribing pattern of anti hypertensive therapy in diabetic patients visiting in government hospital of Dolakha

Stuti Shrestha*, Kedar Prasad Sah, Atul Adhikari, Priyanka Bishwas, Ramesh Kumar Sah, Sapana Ghimire, Tripti Lamsal

ABSTRACT

Introduction: Hypertension and Diabetes Mellitus are two major chronic disorders that frequently coexist progressively with age irrespective of gender. WHO has projected that about 300 million people will suffer from diabetes and 1.5 billion from Hypertension by 2025. Both Hypertension and type II Diabetes are strongly interconnected and predispose an individual to atherosclerotic cardiovascular disease. As the patients require long life treatment, it has increased the burden of patients particularly in developing country like Nepal. In hospitals, there is genuine need for drug utilization study to determine appropriate, more safe and effective patterns of drug therapy among diabetic hypertensive patients.

Methods: A single centered retrospective specify how the study is retrospective cross sectional study was conducted in Jiri Hospital, Dolakha from Feb 2022 to July 2022. A total of 148 prescriptions of the patient with hypertension and coexisting diabetes were analyzed.

Results: The age group of the patients varied from 30-99 years with dominant age interval being32.4% of 50-59 years of age. Most of the patients were male comprising of 56.08% of the total population. For the treatment of hypertension, both monotherapy and combination therapy were followed. In Monotherapy, amlodipine was most prescribed with the percentage of 66%, followed by Losartan (17%). For combination therapy, a two drug combination of Amlodipine and Losartan was projected to the most commonly prescribed combination with a percentage of 59.18% followed by Losartan and Hydrochlorthiazide (26.5%)

Conclusion: The majority of the treated patients were prescribed on monotherapy (66.21%). Antihypertensives given were consistent with JNC VIII do not use abbreviation guidelines. However, there remains potential room for improvement in drug utilization and a critical need for better blood pressure control.

Keywords: Amlodipine, Antihypertensives, Hypertension, Losartan, Prescribing Pattern

INTRODUCTION

Hypertension (HTN) and Diabetes Mellitus (DM) are two major chronic disorders that frequently coexists progressively with age irrespective of gender.[1,2] Patients with HTN often exhibits insulin resistance and are at higher risk of developing diabetes.[2] WHO has projected that about 300 million people will suffer from DM and 1.5 billion from HTN by 2025.[3,4] Both HTN and DM are closely interlinked because of risk factors like vascular inflammation, arterial remodeling, dyslpidemia, atherosclerosis and obesity. The coexistence of both condition accelerates related complications and increases morbidity and mortality.[2,5] This study was conducted to observe the pattern of utilization of different group of antihypertensive drugs in patient with DM in Dolakha.

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MATERIALS AND METHODS

This better to write present study instead of this study. study was conducted in Jiri Hospital in OPD and endocrinology department of JIri Hospital, Dolakha, Nepal. The prescription prescribed were collected, assessed and statistically analyzed. The drug treatment pattern of different antihypertensive agents with coexisting DM was evaluated. The participants declared their willingness on the details of study and treatment has been explained to the participants enrolled into study and they gave written informed consent. Categorical variables were presented as frequency and percentages. Continuousvariables were presented as mean and standard deviation. Assessment of patterns of utilization of antihypertensive drug classes and data was evaluated.

Ethical approval was obtained from the institution's research committee. We also obtained for permission from the management of the hospitals and informed voluntary consent provided by the respondents.

RESULTS

A total of 148 prescriptions were analyzed; belonging to 83 (56.08%) male and 65 (43.91%) female. The mean age of the patients included in the study was found to be 58.34±11.82 (Table 1 and Table 2). Monotherapy was predominantly used than combination therapy. Monotherapy was prescribed to 105 patients and combination therapy to 44 patients. During the overall study, use of five classes of anti hypertensiveswere observed. Amlodipine was observed to be the most prescribed monotherapy drug (61.9%) followed by Losartan (18.09%) (Table 3). The use of ACE inhibitors among HTN with diabetes was very few (7.61%). ARBs was found to be used predominantly than ACE inhibitors. β blockers like Metoprolol, Propranolol was also not frequently prescribed. Prescribing pattern according to gender was found to be almost uniform. (Table 4)

In Combination therapy, the most frequently prescribed combination was Amlodipine and Losartan which were prescribed to 26 patients (59.09%); followed by Losartan and Hydrochlorthiazide which were prescribed to 12 patients (27.27%). (Table 5)

Table 1. Gender wise distribution of patients

Gender	Frequency (n)	Percentage (%)
Male	83	56.08
Female	65	43.91

Table 2. Age wise distribution of patients

Age Category	Frequency (n)	Percentage (%)
30-39	7	4.7
40-49	28	18.9
50-59	48	32.4
60-69	30	20.3
70-79	25	16.9
80-89	9	6.1
90-99	1	0.7

Table 3. Individual antihypertensive drugs prescribed in monotherapy

Drugs	No.of prescription (n)	Percentage (%)
Amlodipine	65	61.9
Losartan	19	18.09
Enalapril	8	7.61
Telmisartan	4	3.80
Metoprolol	5	4.76
Propanolol	2	1.9
Hydrochlorthiazide	2	1.9

Table 4: Gender wise prescription of class of antihypertensive drugs in monotherapy.

Class of drugs	Male (n)	Percentage (%)	Female (n)	Percentage (%)
CCB	34	61.81	31	62
ARB	12	21.81	11	22
ACEI	4	7.27	4	8
β-blockers	4	7.27	3	6
Diuretics	1	1.81	1	2
Total	55		50	

Table 5. Combination therapy of antihypertensive agents.

Combination of two antihypertensive agents	No.of prescription (n)	Percentage (%)

Amlodipine + Losartan	26	59.09
Losartan + Hydrochlorthiazide	12	27.27
Furesemide + Amiloride	2	4.54
Amlodipine + Atenolol	2	4.54
Telmisartan + Hydrochlorthiazide	1	2.27
Tamsulosin + Tolterodine	1	2.27

DISCUSSION

We studied patterns of antihypertensive use in patients with HTN and diabetes; without recent attack on MI, stroke or other comorbidities. Majority of the patients were in the age group above 50 years of age. HTN tends to be more prevalent with increase in age and elderly was more susceptible to be affected from it.[6]

We observed that the chances of getting HTN and diabetes together were more prevalent in male than in females; which coincides with study conducted by Dahal*et al* and Panda *et al*.[6,7]

All antihypertensives were prescribed via oral route, which is a rational approach since pharmacokinetics and clinical trialsindicates that oral forms of drugs are therapeutically effective as well as cost effective and safer in conscious patients.[8]

Our study showed the predominant use of monotherapy than fixed drugs combination of two antuhypertensives. Monotherapy was prescribed to 105 patient and combination therapy to 44 patients. This result was similar to study done by E. Vanathi*et al* and Hussain Z *et al*. [9,10] Most commonly prescribed antihypertensives agent as monotherapy was Amlodipine which was prescribed to 65 patient which accounts to 61.9% of the total patients followed by Losartan prescribed to 19 patients. CCBs can effectively reduce peripheral blood pressure without affecting glomerular filtration rate and renal perfusion.[9]

This result coorelated with the results published by S. Alavudeen*et al.*, Dahal. P *et al* [7,11] where CCB was majorly used as monotherapy but contradicts with the study from others where ACE inhibitors or ARBs are most commonly used monotherapy antihypertensive drugs.[9,10] Our study showed that the highest prescribed combination of antihypertensive was Amlodipine and Losartan. Use of ARBs and CCB combination was frequenty prescribes in the study done by S. Kim *et al*., Mohan P *et al* and Mishra R *et al*.[12-14]

Reduced use of ACE inhibitors may presumably be due to the deposition of bradykinin in lungs causing dry cough especially in Asian population.[15] It may also be due to the availability of alternative; ARBs which was less incidence of adverse effects.[16] A study conducted by Lim et al. reported the increased use of ARBs and reduced use in diuretics in Korea.[17] Patients with both HTN and diabetes are at high risk of having cardiovascular morbidity.[18] The preference of amlodipine in diabetes may seem to be related to positive pharmacokinetic findings which translates into convenient dosing in renal insufficiency.[19]

JNC VIII guidelines suggest thiazide diuretics as an first line agent for the management of blood pressure. However, frequent use of CCB in this study may be due to the fact that CCB is more effective and an antihypertensive agent than diuretics when used as monotherapy.[20] The adherence to the JNC 8 guidelines was good except in case of diuretics.

CONCLUSION

The majority of the treated patients were prescribed on CCBs as monotherapy. Antihypertensives given were consistent with JNC VIII guidelines. However, there remains potential room for improvement in drug utilization and a critical need for better blood pressure control

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Conflict of interest: None.

REFERENCES

1. El-Hazmi MA, Warsy AS. Association of hypertension andnon-insulin-dependent diabetes mellitusin the Saudi population. Ann Saudi Med. 2001; 21(1-2):5-8

2. Petrie JR, Guzik TJ, Touyz RM. Diabetes, Hypertension and Cardiovasculr Disease: Clinical Insights and vascular mechanisms. Can J Cardiol.2018 May; 34(5):

575–584. doi: 10.1016/j.cjca.2017.12.005

3. Wild S, Roglic G, Green A, Sicree R, King H. Global Prevalence of Diabetes: Estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004;27(5):1047–1053.

4. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK. Global burden of hypertension: analysis of worldwide data. *The Lancet*. 2005;365(9455):217–223.

5. Abdelbagi O, Musa IR, Musa SM. *et al.* Prevalence and associated factors of hypertension among adults with diabetes mellitus in northern Sudan: a cross-sectional study. *BMC CardiovascDisord* 21, 168 (2021)

6. Panda BB, Pati MR, Pratapsahu K. A study onsurvey of prescription pattern of antihypertensivedrugs in hypertensive and diabetic hypertensivepatients. Asian journal of Pharmaceutical andclinical Research 2015; 8(1): 250-52

7. Dahal P, Maharjan L, Dahal B, Gupta K. Assessment of Prescription Patterns in Hypertensive and DiabeticPatients visiting Private Tertiary Care Hospital of Dharan Municipality, Nepal. STCJ 2015;2(1):44-4

8. Okonta JM, Nduka SO,.Idodo VE. Prescribingpattern of antihypertensive and anti-diabetic agentsin a secondary healthcare institution in Nigeria.Journal of pharmaceutical sciences and research.2013, 5(1)12 – 17.

9. Elenchezhiyan V, Moorthy S,Sagar MK, Bheemesh Naidu MB, Sayana S. Study ofprescribing pattern of antihypertensive drugs indiabetic patients in a tertiary care centre,Vizianagaram. Int J Basic ClinPharmacol 2019;8:1192-5.

10. Hussain Z, Sana A, Mohammed SA, Razzaq MA.Patterns of drug therapy among diabetic hypertensivepatients with other complications. Int J Pharm PharmSci. 2014;6(6):270-7.

11. Alavudeen SS, Alakhali KM, Mohammad S, Ansari A, Khan NA. Prescribing pattern of antihypertensive drugs in diabetic patients ofSouthern Province, Kingdom of Saudi Arabia. Ars Pharm. 2015; 56(2): 109-114

12. Kim SH, Shin DK, Kim S,Han K, Park SH, Kim YH, et al. Prescribing Patterns of Antihypertensives for Treatment-Naïve Patients in South Korea: From Korean NHISS Claim Data, *International Journal of Hypertension*, vol. 2019, Article ID 4735876, 10 pages, 2019. https://doi.org/10.1155/2019/4735876

13. Sang Hyuck Kim, Dong Wook Shin, Shinhye Kim, Kyungdo Han, Sang-hyun Park, Yul-Hee Kim, Shin-Ae Jeon, Yong-Chol Kwon, "Prescribing Patterns of Antihypertensives for Treatment-Naïve Patients in South Korea: From Korean NHISS Claim Data", *International Journal of Hypertension*, vol. 2019, Article ID 4735876, 10 pages, 2019. https://doi.org/10.1155/2019/4735876

14. Mishra R, Kesarwani P, Keshari SS. Prescriptionpattern of antihypertensive drugs in a tertiary careteaching hospital. Int J Med Sci Public Health. 2017 ;6(4):684-86

15. Mohan P, Bhandare B. Pattern of Antihypertensive therapy among Diabetic hypertensives. World J Pharm Res. 2015;4(8):2403-10.

16. S. E. McDowell, J. J. Coleman, and R. E. Ferner, "Systematic review and meta-analysis of ethnic differences in risks of adverse reactions to drugs used in cardiovascular medicine," *BMJ*, vol. 332, no. 7551, pp. 1177–1181, 2006

17. B. Lim, E. Kang, S.-h. Yoo, and S. Sunwoo, "Utilization pattern of anti-hypertensive medications according to comorbidities in a hospital-based family medicine practice," *Korean Journal of Family Practice*, vol. 7, no. 4, pp. 563–568, 2017.

18. Pooja M., Sumeet, D., Chandan, R., Sachin S,Akshat, D. Prescribing pattern and surveillance ofanti-diabetic drugs in village and city hospital ofIndore district. . Drug Invention Today 2010; 2(9): 415-416.

19. Dutta S ,Udupa A L. Antihypertensive drug use in patients having comorbid diabetes: cross sectional prescription pattern study in a tertiary care hospital. Asian journal of pharmaceutical and clinical research 2010 ;3(4): 43-45

20. 2014 Evidence based guidelines for theManagement of high blood pressure, report fromthe panel members appointed to the eighth jointnational committee (JNC 8) ,JAMA 2013.doi:10.1001/jama.2013.284427

ORIGINAL ARTICLE

Drug Utilization Pattern in Cardiovascular Diseases in a Community Cardiac Hospital

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ABSTRACT

Introduction: Drug utilization research is the powerful exploratory tool to ascertain the role of drug in determining the therapeutic efficacy, cost effective and minimizing the adverse effects. Cardiovascular diseases are major health problem and a common cause of premature morbidity and mortality.

Methods: A prospective cross-sectional study was carried out among in-patients diagnosed with cardiovascular diseases at acommunity cardiac hospital for a period of two months. Patients' records forms and the medical cardexwere reviewed. The descriptive statistics were calculatedusing Microsoft Excel 2016.

Results: Out of 201, 101 (50.25%) patients were females. Seventy four (36.82%) patients were from age group of 61-80 years and 56(27.86%) had systemic hypertension. A total of 2677 drugs were prescribed in 201 patients. The average number of drug per prescription was 13.49. Out of 201, 105 (52.24%) patients were prescribed four or more drugs. Cardiovascular drugs were the most commonly prescribed (898, 33.54%) out of which diuretic drugs were the most common (189, 21.04%) followed by antiplatelet drugs (145, 16.14%) and anticoagulants (116, 12.91%). The highest percentage of cost of medication for patient were less than 1000 NPR (27.86%). The number of encounter of Aluminium hydroxide plus Aspirin was the highest (25).

Conclusion: Diuretics were the most common prescribed cardiovascular drugs in our study. Polypharmacy was practiced in majority of the patients. The highest probability of causing of drug-drug interaction was encountered with aspirin.

Keywords: Cardiovascular diseases, Cardiovascular medication, Drug utilization, Prescribing patterns

INTRODUCTION

Drug Utilization Research (DUR) is the marketing, distribution, prescription and use of drug in society with special emphasis on the resulting medical, social and economic consequences.[1]DUR employs several of information that focus on drug. It is the powerful exploratory tool to ascertain the role of drug in determining the therapeutic efficacy, cost effectiveness and minimizing the adverse effects. Its principal aim is to facilitate rational use of drug in population.[2]It is an important part of pharmacoepidemiology as it describes the prescribing style, extent and exposure of drug.

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Cardiovascular Diseases(CVD) are a group of disorders of the heart and blood vessels which include coronary heart diseases, peripheral arterial diseases, rheumatic heart disease, congenital heart diseases, deep vein thrombosis and pulmonary embolism.[3]It is a major health problem throughout the world and a common cause of premature morbidity and mortality.[4]CVD are associated with a variety of other co-morbid conditions, in particular, diabetes mellitus.

Rational drug use means patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period time and to the lowest cost to them and their community.[5]The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence.[6]Polypharmacy is a major problem with cardiovascular inpatients admitted for a prolonged period of time.[7]Medication quality and patient safety requires a rational prescription of medication and avoidance of inappropriate/irrational prescribing patterns.[8]The present study was conducted tostudy the prescribing pattern, cost medication per prescription and possible drug-drug interaction among cardiac in-patients.

MATERIALS AND METHODS

A prospective cross-sectional study was conducted at a Community Cardiac Hospital in Nepal for a period of two months (November 2018 to December 2018). A total of 201 patients admitted to High Dependent Unit and General Ward were enrolled in the study.All the in-patients diagnosed with cardiovascular disease, patient of all age and both the sexes and patients able to swallow study medication were included in the study. Patients who were not prescribed with cardiovascular drugs and not giving consent to participate were excluded. Simple random sampling method was used. A self-designed proforma was used for data collection that consisted of age, gender, occupation, residence, diagnosis andmedication prescribed (name and route of administration). Permission for research was granted by Institutional Research Committee and the hospital authority.

The study objectives were explained to the patients and written informed consent were taken. Patients' record formsand the medical cardex of the patients were reviewed and the relevant data were recorded directly in the proforma. The data were entered into Microsoft Excel 2016 and checked for its completeness and consistency. Polypharmacy was defined as the use of 4 or more drugs per prescription.[9]Prescribing pattern was defined as the extent and profile of drug use and trends. The descriptive statistics like mean, frequency and percentages were calculated and the findings were presented as graphs and tables.The medications prescribed to the patientswere also analyzed for potential drug interactions as listed byKatzung BG.[10]Cost of the drugs were calculated in the Nepalese currency (NPR) based on the purchased bills of the drugs.

RESULTS

Out of 201 patients, 101 (50.25%) were females. Most of the patient were from age group of 61-80 years (36.82%) followed by 41-60 years age group (32.34%). Sixty nine (34.33%) patients were Brahmin and 87 (43.28%) patients were housewives (**Table 1**).

Table 1. Socio-demographic details of patients (n=201)

Variables		Frequency	Percentage
Gender	Male	100	49.75
	Female	101	50.25
Age groups	18 – 20	10	4.98
	21 – 40	30	14.93
	41 – 60	65	32.34
	61 – 80	74	36.82
	>80	22	10.95
Ethnic groups	Brahman	69	34.33
	Chhetri	23	11.44
	Mongolian*	55	27.36
	Others$	54	26.87
Residence	Urban	72	35.82
	Rural	129	64.18

Occupation	Housewife	87	43.28
	Business	15	7.46
	Service	25	12.44
	Farmer	20	9.95
	Teacher	3	1.49
	Others	51	25.37

**Mongolian: Magar, Gurung, Tamang, Newar; $Others:Yadav, Tharu, Pariyar, Thakuri, Muslim*

Majority of the patients (56, 27.86%) had systemic hypertension followed by Ischemic heart disease (33, 16.42%) (**Figure 1**).

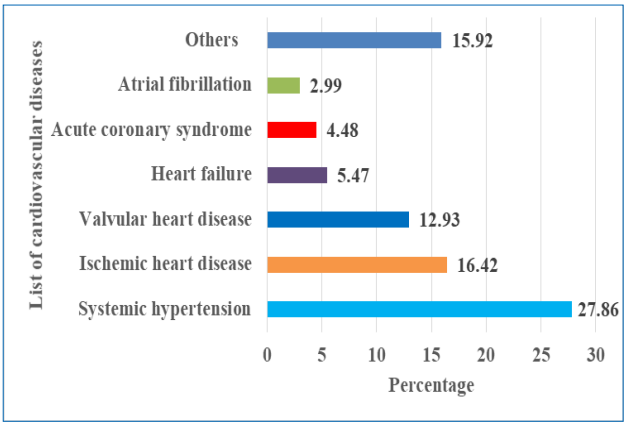

Figure 1. Diagnosis of the patients with cardiovascular diseases (n=201).

A total of 2678 drugs were prescribed in 201 patients. The average number of drug per prescription was foundto be 13.49. The categories of most of the commonly prescribed drug were CVS drugs (33.54%), followed by gastrointestinal drugs (21.29%) and antimicrobial drugs (12.55%) (**Table 2**).

Table 2. Therapeutic classification of prescribed drugs (n=2677)

Therapeutic category of drugs	Frequency	Percentage
Drug acting on cardiovascular system	898	33.54
Antimicrobial Agents	336	12.55
Drug acting on gastrointestinal system	570	21.29
Hormonal drugs	158	5.90
Drug acting on central nervous system	116	4.33
Non-steroidal anti-inflammatory drugs	60	2.24
Drug acting on autonomic nervous system	89	3.32
Drugs acting on respiratory system	211	7.88
Anti-histamines	50	1.86
Drugs acting on musculoskeletal system	23	0.85
Miscellaneous drugs	166	6.20

Out of 898cardiovascular drugs, diuretic drugs were the most common prescribed drugs (189, 21.04%) followed by antiplatelet drugs (145, 16.14%) and anticoagulants (116, 12.91%). A total of 750 (83.51%) and 148 (16.48%) drugs were prescribed through oral and injection routes respectively (**Table 3**).

Table 3. List of Cardiovascular prescribed medication (n=898)

List of drug	Routes		Frequency	Percentage
	Oral	Injection		
Diuretics	114	75	189	21.04
Antiplatelets	145	0	145	16.14
Anticoagulants	84	32	116	12.91
Hypolipidemics	94	3	97	10.80
Calcium Channel Blocker	74	1	75	8.35
Antianginal drugs	60	12	72	8.01
Angiotensin Receptor Blockers	58	0	58	6.45
Beta-Blockers	41	6	47	5.23
Inotropic agents	26	17	43	4.78
Cardiac glycosides	38	1	39	4.34
Angiotensin Converting Enzyme Inhibitors	16	1	17	1.89

Out of 201, 105 (52.24%) patients were prescribed four or more drugs (**Figure 2**).

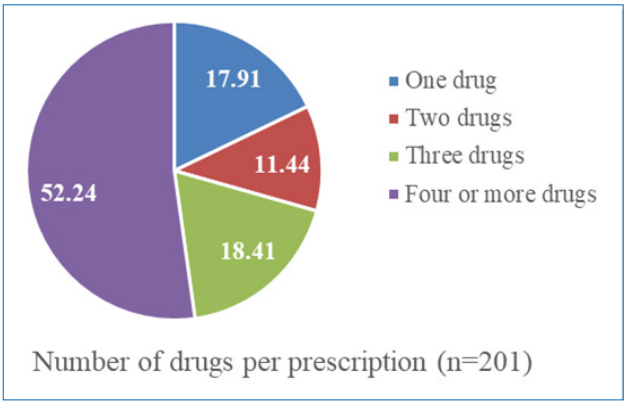

Figure 2. Numbers of cardiovascular drugs per prescription (n=201)

Medication cost per prescription is given in Figure 3.Overall, the study found that the highest percentage of cost of medication for patient were less than 1000 NPR (27.86%), followed by more than 5000 NPR (26.37%) and 1000-2000 NPR (19.30%).

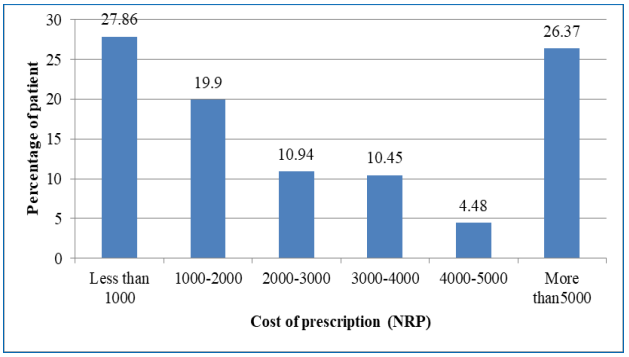

Figure 3. Pricing of medications (n=201)

Interacting pair of drug with the potentially hazardous effect and clinically documented: In the study, the number of encounter of Aluminium hydroxide plus Aspirin has the highest (25) followed by Enoxaparin Sodium plus Aspirin (22) and Aspirin plus Furosemide (21).

Table 4. Interacting pair of drug with the potentially hazardous effect (n=80).

Ranking	Drug combination	Properties Promoting Drug Interaction	No. of encounter	Clinically Documented Interactions*
1.	Aluminium Hydroxide + Aspirin	• Antacids may adsorb drugs in GIT, thus reducing absorption. • Aluminum hydroxide alkalinize the urine somewhat, thus altering excretion of drugs sensitive to urinary pH.	25	Aspirin [P]: • Increased renal clearance of aspirin due to increase urine pH. • Occurs only with large doses of aspirins.
2.	Enoxaparin + Aspirin	• Aspirin (but not other salicylates) interferes with platelet function. • Large doses of salicylates have intrinsic hypoglycemic activity	22	Heparin [NE]: • Increased bleeding tendency with aspirin, but probably not with other salicylates
3.	Aspirin + Furosemide	• Prostaglandin inhibition may result in reduced renal sodium excretion, impaired resistance to hypertensive stimuli, and reduced renal lithium excretion.	21	Furosemide [P]: • Decreaseddiuretic, natriuretic andantihyperten-sive response to furosemide.
4.	Aluminium hydroxide + Digoxin	• Antacids may adsorb drugs in gastrointestinal tract, thus reducing absorption. • Antacids tend to speed gastric emptying, thus delivering drugs to absorbing sites in the intestine more quickly.	5	Digoxin [NP]: • Decreased gastrointestinal absorption of digoxin.
5.	Aspirin + Enalapril, Ramipril	• Prostaglandin inhibition may result in reduced renal sodium excretion, impaired resistance to hypertensive stimuli.	4	ACE inhibitors [P]: • Decreased antihypertensive response.

6.	Digoxin + Amiodarone	• Digoxin susceptible to alteration of gastrointestinal absorption. • Digitalis toxicity may be increased by drug-induced electrolyte imbalance (e.g., hypokalemia). • Renal and nonrenal excretion of digoxin susceptible to inhibition.	3	Amiodarone [P]: • Increased plasma digoxin concentrations.

**P: Predictable; HP: Highly predictable; NE: Not established, NP:Not predictable*

DISCUSSION

In the present study, numbers of male and female patients were almost equal. In contrast, 64.7% patients were male and 35.3% female in an Indian study.[11] Majority of the patients (36.82%) were in the age group of 60-80 years. The similar finding was also reported in another study (24%).[12]The diuretics drugs (21.04%) were more used in majority of the patients followed by anti-platelet drugs. A similar study conducted in the Karnataka (India) found that the diuretics drugs (29.80%) were commonly used in the patient followed by anti-hypertensives (29.44%) and anti-platelets (16.87%).[12] Diuretics remain the first line of treatment of edema or volume overload particularly in patients withcongestive heart failure. Diuretics reduce pulmonary edema and venous congestion.[14]

Majority of the patients were diagnosed with systemic hypertension (26.86%) followed by Ischemic Heart Diseases (IHD) (16.42%) than other diagnosis of diseases, which was in accordance with the study conducted in Maharashtra, India in which more patient were diagnosed with hypertension (33%%) followed by Diabetes mellitus (16%) and IHD (10%). Hypertension and diabetes mellitus are the most commonly associated comorbidities in cardiovascular patients.[15] The average number of drug per prescription was 13.49 and more than half of the patients (52.44%) were prescribed four or more drugs which highlights the prevalence of polypharmacy in the present study. This might lead to increased mortality, morbidity and other costs, low adherence and side effects.[16]

In the study, it was found that aspirin was the most common drug with a high probability of causing drug-drug interaction followed by enoxaparin and aluminum hydroxide. The possible reason behind high risk of drug-drug interaction in cardiovascular diseases may include elder age, multiple drug regimen and pharmacokinetic and pharmacodynamics nature of the drugs used. Poly-pharmacy and longer hospital stay also influences the incidence rate of potential drug-drug interaction. The similar study was conducted in India found that Aspirin (44.45%) was the most common drug causing possible drug-drug interaction followed by Heparin (42.78%) and Clopidogrel (22.16%).[17] The present study has some limitations. The study duration was small. Being a single center study, the study findings could not be generalized.

CONCLUSION

Diuretics were the most common prescribed cardiovascular drugs.Oral route was mostly preferred than intravenous route. Polypharmacy was practiced in more than half of the patients. The highest probability of causing of drug-drug interaction was encounteredwith Aspirin.Cost of the medicines was more than 5000 NPR in more than one fourth of the patients. The drug-drug interactions and prescribing pattern can be improved by reducing the number of drugs per prescription. Practice of generic drug prescription would reduce the economic burden of the patients.

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Conflicts of Interest: None

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REFERENCES

1. Introduction to drug utilization research. Chapter 1. Geneva: World Health Organization; 2003. WHO. Available from: http://apps.who.int/medicinedocs/pdf/s4876e/s4876e.pdf.
2. Bergman U, Popa C, Tomson Y, Wettermark B, Einarson TR, Aberg H, Sjöqvist F. Drug utilization 90%-a simple

method for assessing the quality of drug prescribing. Eur J ClinPharmacol. 1998;54(2):113-18.
3. Aswani B, Reddy P, Yanadaiah P, Sujatha S. Astudy on prescribing pattern of cardiovascular drugs and potential drug-drug interaction in an in-patient cardiology unit of a cardiac, European Journal of pharmaceutical and Medical Research.2016; (8):294-305.
4. Muhit A, Rahman O, Raihan SZ, Asaduzzaman M, Akbar MA, Sharmin N, Faroque ABM. Cardiovascular diseases prevalence and prescription patterns at a tertiary level hospital in Bangladesh. Journal of Applied Pharmaceutical Science. 2012; 2(3):80-84.
5. Promoting Rational Use of Medicines: Core Components. Available from: http://apps.who.int/medicinedocs/en/d/Jh3011e/2.html.
6. Sreedevi K, Rao V, FareedullahMd F, Kumar V. A study on prescription pattern of statins in cardiovascular diseases, Scholars Research Library. 2011;3(3):393-96.
7. Hovstadius B, Hovstadius K, Astrand B, Petersson G. Increasing polypharmacy - an individual-based study of the Swedish population 2005-2008. BMC ClinPharmacol. 2010;10:16.
8. K Mukesh, Dahiya V, Mishra S, Sharma D, Mishra N, Lahkar M. Cardiovascular diseases prevalence and drug utilization patterns at a tertiary care hospital in Northeastern India. International Journal of Pharmaceutical Sciences.2016; 8(6):116-19.
9. Varghese D, Ishida C, HaseerKoya H. Polypharmacy. [Updated 2022 Sep 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK532953/
10. HornJR. Important Drug Interactions and Their Mechanisms. In: Basic and Clinical Pharmacology, 12th edition, Mc Graw Hill 2012, P:1148-62.
11. H Nagabushan, HS Roopadevi, GM Prakash, R.Pankaja. A prospective study of drug utilization patterns in cardiac intensive care unit at a tertiary care teaching hospital. International Journal of Basis and Clinical Pharmacology. 2015;4:579-83.
12. Jewargi PK, Mala Rd. Drug utilization study in congestive heart failure at a tertiary care hospital, Scholars. Journal of Applied Medical Sciences. 2015;3(2E):857-62.
13. Bharath KD, Chandrashekar R, Manohar VR, Mohandas R, Gopalakrishna HN, Reefa Dsouza. Drug utilization pattern in patients with congestive cardiac failure in a South Indian tertiary care hospital. International Research Journal of Pharmacy. 2015;6(7):463-466.
14. Pellicori P, Kaur K, Clark AL. Fluid Management in Patients with Chronic Heart Failure. Card Fail Rev. 2015;1(2):90-95.
15. Vakade KP, Thorat VM, Khanwelkar CC, Jadhav SA, Sanghishetti VM. A study of prescribing pattern of drugs in patients of cardiovascular emergencies at a tertiary care hospital of western Maharashtra. International Journal of research in Medical Sciences.2016; 4(2):556-61.
16. Volpe M, Chin D, Paneni F. The challenge of polypharmacy in cardiovascular medicine. FundamClinPharmacol. 2010;24(1):9-17.
17. Patel VK, Acharya LD, Rajakannan T, Surulivelrajan M, Guddattu V, Padmakumar R. Potential drug interactions in patients admitted to cardiology wards of a south Indian teaching hospital. Australas Med J. 2011;4(1):9-14.

ORIGINAL ARTICLE

Practice of exclusive breastfeeding and its factors among job holder mothers of Lalitpur metropolitan city

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ABSTRACT

Introduction: According to WHO, first six months of a child should be fed only breast milk which is crucial for an optimal growth. During this period, an infant should not be given any type of solid, semi solid or liquid food except breast milk. It is considered to protect an infant from several chronic diseases and prevents 10% of the child death in further life. Thus, the objective of the study is to assess the practice of exclusive breastfeeding (EBF) and its associating factors among the job holder mothers of Lalitpur metropolitan city.

Methods: The study was done on job holder mother working in Lalitpur metropolitan city. Cross sectional study was done through clustered sampling technique. The total number of the sample was 165. A structured questionnaire was used as the tool. The confidentiality of the respondents were maintained and required ethical consideration was taken. Analysis of data was done by using descriptive statistics and chi- square test was used for association between knowledge and practice about EBF among the job holder mothers.

Results: About 53.3% of the respondent had good knowledge about EBF whereas 52.8% had overall good practice of EBF. Also around 37.6 % expressed milk feeding, only 20% of the respondent succeeded to breastfeedingfor at least 6 months which is the major requirement of EBF and there was no association between knowledge and practice about EBF among the job holder mothers.

Conclusions: There was no association of the knowledge and practice. Even though the study found overall good knowledge and practice among the job holderdespite of good practice the prevalence of EBF is still poor among the job holder mothers.

Keywords: Exclusive breastfeeding, job holder mothers, practice

INTRODUCTION

According to WHO, first six months of a child is crucial for an optimal growth so a child should be only fed breast milk during this period.[1] Breast milk has been proven as one of the best option for both child and a mother. It is the most cost effective and a vital intervention in reduction of child mortality and morbidity.[2,3] The act of breastfeeding is not only essential for the children but also beneficial to the mothers. The prolonged breastfeeding helps the mother to stay at the lower risk of breast cancer and ovarian cancer.[4]

According to the Labor Act 2074 the Maximum number days as maternity leave is 98 days. This includes only 60 days of paid leave.[5] Even having 98 days of total maternity leave it is not enough to breastfeed the child exclusively. Due to which the mothers have to choose

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alternatives such as expressed milk feeding, Cerelac, litto, Lactogen etc. Even though, expressed milk is also the source of breast milk, it have few adverse effects too.[6] There may be several factors responsible for discontinuing breastfeeding by the job holder mothers before 6 months.

According to the Nepal Demographic And Health Survey (NDHS) report, the overall status of exclusive breastfeeding of Nepal is 66% which is a decrement from 70%, recorded in 2011 whereas in Chitwan, only 67.1% of the working women exclusively breastfed their children.[7] Similarly, urban areas are considered well equipped with better option for any action. Despite of that a study done in Kathmandu among the working women of the factories, 34% of the respondents could complete the criteria for the exclusive breastfeeding.[8] Likewise, in a tertiary hospital based study conducted in 2018, only 11% of the women got their children breastfed for 6 months.[9] Therefore, it is important to study practice of exclusive breastfeeding and its factors among job holder mothers of Lalitpur metropolitan city.

METHODS

A descriptive cross-sectional study was used. The study population was job holder mothers of under 2 years old age children of different types of organization of Lalitpur metropolitan city. The time frame of the overall study was from Magh 2076 to Chaitra 2077.

The prevalence rate was exclusive breastfeeding rate of Nepal. The sample size for the study was 165.

We know, $n = Z^2pq/d^2$

$= (1.81)^2 * 0.66*0.34\ (0.07)^2$

=150.03

~150

Also, adding 10% of the sample size i.e. 15 as non-respondents

Total sample size (n) = 150+15

= 165 where, n = sample size, Z = value at 93% confidence level i.e. (1.81), p = estimated prevalence of Exclusive breastfeeding, q = the probability of non-occurrence of p (i.e. 1-p) and d = the estimated error.

The ethical consideration from HOPE international College was taken for conducting the research. Approval from Lalitpur Metropolitan city was taken to conduct the research.Consent from wards were taken for the study.Individual consent (Both verbal and written) was taken from the respondent along with their confidentiality.

The metropolitan city was selected purposively. Then a Clustered sampling was done. Four different clustered were selected. Four wards which lies under the clustered were covered. The institutions were chosen serially and the available respondents were chosen from the selected institutions. A structured questionnaire was used as tool for the data collection. The tool was self-constructed with the help of extensive literature review. A self-administration of the questionnaire was done on the respondents.

The data editing was done manually whereas the data was managed, analyzed and interpreted through SPSS version 20. Mean and Chi-square were used as the bio statistical tool for bio statistical calculation.

RESULTS

Table 1. Socio demographic information of the respondents

Characteristics	Frequency (n=165)	Percentage
Age of mother (Years)		
22-26	10	6.1
27-31	84	50.9
32-36	56	33.9
37-41	15	9.1
Educational status of respondent		
Uneducated	1	.6
Educated	164	99.4
Educational level of respondent (n=164)		
Can read and write	3	1.8
Primary level (1-5)	1	.6
Basic Level education (6-10)	4	2.4
Higher education (11-12)	32	19.4
Bachelor and above	124	75.2

Religion of respondent		
Hindu	141	85.5
Christian	9	5.5
Buddhist	13	7.9
Muslim	1	.6
Others	1	.6
Ethinicity of respondent		
Bhramin	38	23
Chettri	46	27.9
Janajati (Indigenous)	67	40.6
Dalit	3	1.8
Others	11	6.7
Type of family of respondent		
Nuclear	76	46.1
Joint	89	53.9
Marital status of respondent		
Married	162	98.2
Divorced	1	.6
Widow	1	.6
Others	1	.6

Table 1 shows the characteristics of the respondents. Among 165, the majority of respondent were 27-31 years old. Almost all of them were educated and over 75 % of them were at least graduated. 85 % of them followed Hinduism. The other religion was Muslims. The Brahmins, Chettri and Janajati were the major ethnic groups that participated in the study. Most of the respondents belong to joint family and almost all of them were married.

Table 2. Organizational details of the respondent

Characteristics	Frequency (n=165)	Percentage
Working Organization		
Bank	46	27.9
Co-operative	32	19.4
School	36	21.8
College	4	2.4
Office	36	21.8
Social Organization	8	4.8
Others	3	1.8
Type of Organization		
Government Office	38	23
Non-Government Office	19	11.5
Private	90	54.5
Public	18	10.9
Post of respondent in the organization		
Office assistant	47	28.5
NayabSubba	4	2.4
Officer level	45	27.3
Higher post	26	15.8
Teacher	30	18.2
Helper	6	3.6
Cashier	7	4.2
Completed years in organization		
1-5	105	63.6
6-10	48	29.1
11-15	11	6.7
16-20	1	.6
Maternity leave		
45	13	7.9
60	76	46.1
75	5	3.0
90	44	26.7
98	27	16.4

Table 2 shows the Organizational details of the respondents. The major organization visited for the study were Banks, School, Office and cooperatives. Only few social organization, colleges and others (finance) were visited as. 54 percent of the organization were private, 23 percent were government around 11 percent of the organization were non-governmental and public organization. Majority of the respondent were office assistant, officers and from other higher post. Around 64 percent of the respondent were at least involved for 1-5 years in the organization. 46 percent of the organization provides at least 60 days maternity leave.

Table 3. Knowledge regarding breastfeeding and EBF

Characteristics	Frequency (n=165)	Percentage
Heard about breastfeeding		
Yes	165	100
Importance of breastfeeding*		

Main source of food	164	99.4
Safe and hygienic	132	80
Helps in birth spacing	98	59.4
Prevent breast cancer and other chronic disease	125	75.8
Helps to reduce weight of mother	115	69.7
Good relation between mother and child	152	92.1
Importance of breastmilk*		
Healthy physical and mental growth	165	100
Cognitive development	123	74.5
High immunity power	164	99.4
Gives full nutrition to child	162	98.2
Reduces risk of obesity in child	81	49.1
Reduces risk of communicable diseases	115	69.7
Heard of exclusive breastfeeding		
Yes	87	52.7
No	78	47.3
Knowledge of exclusive breastfeeding		
<6months	6	3.6
6months	154	93.3
>6months	5	3

*Multiple response**

As shown in table 3 all the respondent have heard about breastfeeding but only 52.7 percent of the mothers have heard about EBF. All the mentioned importance of the breastfeeding and breastmilk has been stated by majority of the respondents. Out of 165 respondents 154 (93.3 percent) knew to exclusively breastfeed for exact 6 months.

Table 4. Knowledge and practice level of the respondents

Characteristics	Mean	Frequency (n=165)	Percentage
Level of knowledge			
Poor knowledge	14.4	77	46.7
Good knowledge		88	53.3
Level of practice (n=163)			
Poor practice	2.68	77	47.2
Good practice		86	52.8

The above table shows that out of 165 respondents only 53.3% of them pursue good knowledge about the proper EBF. Whereas 52.8% of them have good practice of EBF. Out of 165 respondent 163 responded for practice related queries whereas other 2 did not practice BF.

Table 5. Association between level of knowledge and practice among the respondents n=165

		Level of knowledge (Percentage)		Total	X^2	p-value
		Poor knowledge	Good knowledge			
Level of practice	Poor practice	40	37	77		
	Good practice	37	49	86	1.298	0.255*
Total		77	86			

Chi-square value=1.298 d.f=1

P-value=0.255 (>0.05 so there is no association)

The above table represents that only 49% of the respondent has good knowledge and good practice at the same time. Since the overall p-value is 0.25 i.e>0.05 the knowledge and practice among the job holder mother about breastfeeding in not associated.

DISCUSSION

In this study, the major age group is 27-31 years. Almost all of the respondents were educated. The respondent who have heard about breastfeeding is universal and only 53% of them have heard about EBF. The study presented a good knowledge among 53.3% and good practice among 52.8% of respondent but only 20% of them could exclusively breastfeed their child. The major factors found was majorly identified as maternity leave, not allowing babies in the workplace, low milk production, support from family, knowledge on EBF and support from workplace. Similarly, a study done in Ghana on professional mothers, the major age group was 20-30 years. [10] The rate of EBF was only 10%. Almost all of the respondent were well educated. Majority of them had heard about exclusive