Prescribing pattern of drugs for cardiovascular co-morbidities in type 2 diabetes mellitus in a tertiary care Indian hospital

Sir,

In recent years, India has become a country with the largest number of diabetics.\textsuperscript{[1,2]} Diabetes is an important and increasingly prevalent independent risk factor for cardiovascular diseases and stroke.\textsuperscript{[3]} It is reported that about 60-80\% of the individuals with diabetes will eventually become hypertensives.\textsuperscript{[4]} Dyslipidemia in the patients with diabetes has been shown to increase the risk of coronary heart disease.\textsuperscript{[3]}

Chronic complications of diabetes are dominated by ischemic heart disease (IHD), myocardial infarction, congestive heart failure, hypertension, and dyslipidemias, which necessitate intensive drug therapy along with lifestyle modifications. They are a much larger burden on both diabetic patients and overall medical costs than diabetes itself.\textsuperscript{[4,5]} Study of drug-prescribing pattern can give insight into the trends in using the drugs in diabetics in treating their co-morbid conditions. The knowledge of prescription pattern can lead us toward the rational drug use and help to take measures to improve prescribing habits.\textsuperscript{[2]}

The present study was undertaken to analyze the prescribing pattern of drugs used in cardiovascular co-morbid conditions in type 2 diabetes mellitus. For that we have identified the prevalence of IHD, hypertension, and dyslipidemia in type 2 diabetic patients attending the outpatient department (OPD) of our teaching hospital. An attempt was also done to identify whether the number and pattern of the drug prescription vary with the control of diabetes.

This study was conducted in the OPDs of cardiology and general medicine of a tertiary care hospital. The study protocol was approved by the Institutional Ethical Committee. Type 2 diabetic patients of at least 1-year duration; between 30 and 75 years of age of either sex with history of IHD, hypertension or dyslipidemia were included in this study. Considering the increased prevalence of other co-existing disease conditions, the patients above 75 years were excluded. Data were collected from the medical records of 100 diabetic patients criteria who had visited the OPD from June to December, 2012 using a
proforma to record the demographics of patients, their blood glucose/glycosylated hemoglobin (HbA1C) levels, diagnosis and drugs prescribed. The blood glucose levels/HbA1C was used to identify the glycemic control of the patients and they were classified as controlled fasting blood sugar (FBS) ≤110 mg/dL/HbA1C ≤7) and uncontrolled diabetics (FBS >110 mg/dL/HbA1C >7). A descriptive analysis of data was done to find the prescribing pattern of cardiovascular drugs in controlled and uncontrolled diabetics.

Out of 100 patients, 64% were males and 36% were females with a mean age of 56.42 ± 11.59 and 53.42 ± 10.35 years respectively. In our study population, 23 patients had controlled diabetes and 77 patients had uncontrolled diabetes. The mean duration of type 2 diabetes in controlled population was 5.57 ± 2.98 years whereas in uncontrolled group, it was 7.18 ± 5.8 years. Systemic hypertension was the most common cardiovascular co-morbidity among the diabetic patients with a prevalence of 56% [Figure 1]. Among these patients, 21% had coexisting IHD and 3% had dyslipidemia. Systemic hypertension was followed by IHD (48%) and dyslipidemia (20%).

The most common antihypertensive drug used was calcium channel blockers (CCBs, amldopine 25%) and 14% of the patients received a combination of antihypertensive agents [Table 1]. The other antihypertensive drugs used were β-blockers, angiotensin receptor blockers (ARB) (AT1-blockers), Angiotensin converting enzyme inhibitors (ACEI) and α-antagonists. The common combination prescribed was CCB with ACEI. The commonest anti-platelet drug used was clopidogrel (22%).

Moreover, 12% of the IHD patients received aspirin and 14% of the patients received both clopidogrel and aspirin. All the patients with dyslipidemia were prescribed statins.

| Co-morbidity | Drugs prescribed | Total drug usage (%) | Controlled diabetic patients (%) | Uncontrolled diabetic patients (%) |
|--------------|------------------|----------------------|---------------------------------|-----------------------------------|
| Hypertension | CCBs             | 25                   | 61.5                            | 41.9                              |
|              | β-Blockers       | 7                    | 15.4                            | 11.6                              |
|              | AT1-antagonists  | 5                    | -                               | 9.3                               |
|              | ACE inhibitors   | 4                    | 7.7                             | 6.9                               |
|              | α-Antagonist     | 1                    | -                               | 2.3                               |
|              | Combinations     | 14                   | 15.4                            | 27.9                              |
| IHD          | Clopidogrel      | 22                   | 22.2                            | 51.3                              |
|              | Aspirin          | 12                   | 44.4                            | 20.5                              |
|              | Combinations     | 14                   | 33.3                            | 28.2                              |
| Dyslipidemia | Statins          | 20                   | 100                             | 100                               |

CCBs were prescribed more in the controlled diabetic patients. The usage of combined antihypertensive drugs was more in the patients with uncontrolled diabetes than in the controlled diabetes. AT1-receptor blockers were prescribed only in the patients with uncontrolled diabetes. Clopidogrel was prescribed more among uncontrolled diabetes patients whereas aspirin was prescribed more in the controlled diabetic patients. The mean numbers of cardiovascular drugs in the controlled diabetics was found to be 1.39 ± 0.58 whereas in uncontrolled diabetics it was 1.82 ± 1.10. The higher number of uncontrolled diabetic patients may be a reflection of their poor adherence to therapy, low awareness and lack of education. This may lead to the need of more drugs or combinations to manage their co-morbid conditions.[6]

Studies have shown that in diabetic patients, prevention or reduction in proteinuria, blood pressure control, glycemic control and particularly, the blockade of renin-angiotensin system are essential to prevent or delay the vascular diabetes complications.[6] However, we noted only a few percentage of diabetic patients were treated with ACEIs or ARBs. Hence based on the recommendations, the drugs acting on renin-angiotensin-aldosterone axis should be the cornerstone of therapy for these patients.[6] The higher number uncontrolled diabetic patient necessitates measures to improve patient’s adherence and monitoring. Future studies with larger sample size may reveal any gender differences in the prescribing pattern of cardiovascular drugs or the influence of glycemic status on their treatment outcomes or any drug-drug interactions. Further, it will be of interest to find above which level of lack of control is potentially dangerous or what practical drug use changes are required in the uncontrolled glycemic group to prevent further damage.

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Research Letter

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REFERENCES

1. WHO factsheet, Diabetes, 2009. Available from: http://www.who.int/mediacentre/factsheets/fs312/en/. [Last accessed on 2013 June 03].
2. Sultan G, Kapur P, Aqil M, Alam MS, Pillai KK. Drug utilization of oral hypoglycemic agents in a university teaching hospital in India. J Clin Pharm Ther 2010;35:267-77.
3. Nathan DM, Cleary PA, Backlund JY, Genuth SM, Lachin JM, Orchard TJ, et al. Intensive diabetes treatment and cardiovascular disease in patients with type 1 diabetes. N Engl J Med 2005;353:2643-53.
4. McMillan DE. Development of vascular complications in diabetes. Vasc Med 1997;2:132-42.
5. Otelı, Ledru F, Danchin N. Ischemic heart disease in type 2 diabetes. Metabolism 2003;52 (8 Suppl 1):6-12.
6. Ribeiro-Oliveira A Jr, Nogueira Al, Pereira RM, Boas WW, Dos Santos RA, Simões e Silva AC. Thérèse-angiotensin system and diabetes: An update. Vasc Health Risk Manag 2008;4:787-803.

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