

Comparison of Generic and Branded Drugs on Cost Effective and Cost Benefit Analysis.

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Received: December 2016

Accepted: December 2016

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ABSTRACT

Background: To study cost-effective and cost-benefit analysis of antibiotic prescription in patients who had enteric fever and was given intravenous ceftriaxone. **Methods:** This was a prospective observational study conducted in a tertiary care hospital. 200 patients who have been diagnosed with enteric fever and were prescribed ceftriaxone were studied and their prescriptions were analyzed. 5 brands of most commonly prescribed ceftriaxone injections were chosen to analyse cost-effective and cost-benefit analysis. Our study showed that there was a major difference of prizes between generic and 5 most commonly prescribed brands of the same drug. Use of branded drugs was associated with increase cost of treatment and in many cases was responsible for failure to take complete treatment as prescribed by treating physician. **Results:** This Study was conducted on 100 patients, 68 males and 32 females, diagnosed with enteric fever. Out of these patients Maximum number of patients were seen between age group of 30-40 years (34) and minimum patients belonged to age group of more than 60 years (8). Analysis of prescriptions revealed that 80 patients were prescribed Branded drugs and 20% were prescribed generic drugs. Out of these 80 patients who were prescribed branded drugs most common 5 brands were studied. The analysis of the cost of single dose of inj ceftriaxone revealed that branded drugs were 3.12 % to 200.84 % more in comparison with generic IV ceftriaxone. Analysis of cost of 1 day of treatment with IV ceftriaxone 1gm revealed similar figures. Total cost of treatment was Rs 595 for generic drug and 1790 for branded drug with maximum MRP. The Analysis of patients who discontinued treatment before completion revealed that most of them belonged to Brand E (30%) and minimum number of patients belonged to Generic group (5%). **Conclusion:** The cost of most commonly prescribed branded drugs was significantly higher (3%-200%) than generic drug and prescribing branded drugs was associated with failure to take complete treatment as prescribed by treating physician.

Keywords: Branded, Generic, enteric fever, ceftriaxone, cost-effective analysis.

INTRODUCTION

A major chunk of healthcare spending is used for buying pharmaceutical products. With improvements and advances in health-care sector this spending is expected to rise exponentially. Part of it is due to demographic changes and part of it is due to better diagnosis and screening of conditions like hypertension and diabetes etc.^[1] These changes are also the concern of governments around the globe as it is the responsibility of the government to contain the cost of drug bill. In many countries, like Australia, governments do economic evaluation before a drug is approved for reimbursement.^[2] The actual cost of drug is not much important in this respect and what really important is value of drug therapy which deals with not only the cost of the drug but benefits of its use. Pharmacoeconomics deals actually with this aspect of the drug use.^[3]

Rational prescription of drugs is impossible without the knowledge of pharmacoeconomics. The fact that the decision of choosing the drug is made by doctor and not the consumer (patients) makes it a matter of moral and ethical responsibility of treating physician to see it to that the treating doctor prescribe medicine consistent with the principles of pharmacoeconomics.^[4]

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In a developing country like that of india where ignorance and poverty is rampant it becomes all the more relevant to emphasize the importance of pharmacoeconomics while prescribing drugs. Given

the fact that prescribing relatively expensive drugs is responsible for inability of taking complete treatment by patients or sometimes they have to continue taking treatment at the cost of other essential needs of life. This becomes all the more important in treatment of acute life threatening conditions like meningitis, encephalitis, enteric encephalopathy and acute severe asthma etc.^[5]

Prescribing generic drugs can be one of the important steps towards making the prescription an affordable one. World health organization defines generic drug as “a pharmaceutical product, usually intended to be interchangeable with an innovator product, that is manufactured without a license from the innovator company and marketed after the expiry date of the patent or other exclusive rights”.^[6] Food and drug administration of USA defines a generic drug as “A generic drug that is identical—or bioequivalent to a brand name drug in dosage form, safety, strength, route of administration, quality, performance characteristics and intended use”.^[7] Though by definition generic drugs are equivalent to branded drugs in all respects including efficacy, safety, strength and quality many physicians are reluctant to prescribe these drugs because they are usually thought to be inferior to branded drugs.^[8] Other factors responsible for prescribing branded drugs are ignorance of difference of cost, unethical practice of giving gifts to doctors by pharmaceutical companies, peer pressure from other popular physicians and lack of quality control in some cases of generic drugs.^[9]

To encourage prescription of generic drugs by treating physicians MCI in its states “Every physician should, as far as possible, prescribe drugs with generic names and he/she shall ensure that there is a rational prescription and use of drugs.”^[10]

We conducted a study of 100 patients who were diagnosed with enteric fever and in whom intravenous ceftriaxone was prescribed. 3 brands of most commonly prescribed ceftriaxone injections were chosen to analyze cost-effective and cost-benefit analysis. Our study concluded that there was a major difference of prizes between generic and 3 most commonly prescribed brands of the same drug. Prescriptions of branded drugs were responsible for rise in the cost of complete treatment and this was responsible for incomplete treatment taken by many patients.

MATERIALS AND METHODS

This was a prospective observational study conducted in the medicine ward and outpatient department of a tertiary care hospital. A total of 100 prescriptions, of both outpatients and inpatients diagnosed with enteric fever and were given antibiotics were analyzed. These prescription were analyzed for cost minimization analysis as intravenous ceftriaxone is the most commonly

prescribed antibiotic for the patients of enteric fever. Top three of the commonly prescribed branded ceftriaxone were compared with generic ceftriaxone and their cost difference and whether patients have taken complete treatment or not were analyzed. The cost of most commonly prescribed branded ceftriaxone was taken from the printed maximum retail price printed on the injections. The prices of the generic versions of these antibiotics were obtained from the official price list of generic medicines put up by the department of pharmaceuticals, government of India, on the website

[http://janaushadhi.gov.in/list_of_medicines.html].

RESULTS

Out of 100 patients who were diagnosed to be having enteric fever 68 were males and 32 were females [Figure 1]. All patients were above 18 years of age. Minimum age was 19 years and maximum age was 64 years [Figure 2]. Paediatric patients were not included in the study as the doses are variable in paediatric age group. Maximum number of patients were seen between age group of 30-40 years and minimum patients were seen between age group of more than 60 years.

5 most commonly used branded drugs were analysed. For the purpose of simplicity these brands were re-named as Brand A, Brand B, Brand C, Brand D and Brand E. Where as generic ceftriaxone 1 gm was re-named as Brand G. Out of these 100 patients 15 patients were prescribed brand-A, 27 patients were prescribed brand-B, 13 patients were prescribed brand-C, 15 patients were prescribed brand-D, 10 patients were prescribed brand E and 20 patients were prescribed [Figure 3].

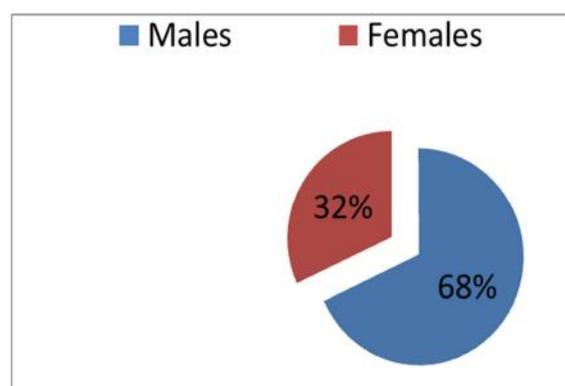


Figure 1: Gender distribution of the studied cases.

The dose of ceftriaxone used in all patients was intravenous ceftriaxone 1 gm BD. The usual duration was 5 days. The patients who were given any dose other than 1gm IV BD or any duration other than 5 days were excluded from the study to bring uniformity to the cost-effective analysis.

As the first step towards cost-effectiveness and cost-benefit analysis the rates of 1 vial of branded ceftriaxone and generic ceftriaxone was compared. The analysis of the cost of single dose of inj ceftriaxone revealed that the cost of single dose of branded IV ceftriaxone was approximately 3.12 % to 200.84 % more in comparison with generic IV ceftriaxone.

Analysis of cost of 1 day of treatment with IV ceftriaxone 1gm revealed that the cost of generic IV ceftriaxone was less than 200.84 % of the branded

IV ceftriaxone with highest Maximum retail price and 3.12 % less than brand with lowest maximum retail price [Figure 4].

The total duration for which IV ceftriaxone was prescribed was usually 5 days. After which generally patients were switched to oral antibiotics like cefixime or cefodoxime. The analysis of total cost of treatment of IV antibiotics when compared was significantly more in branded drugs than generic drug.

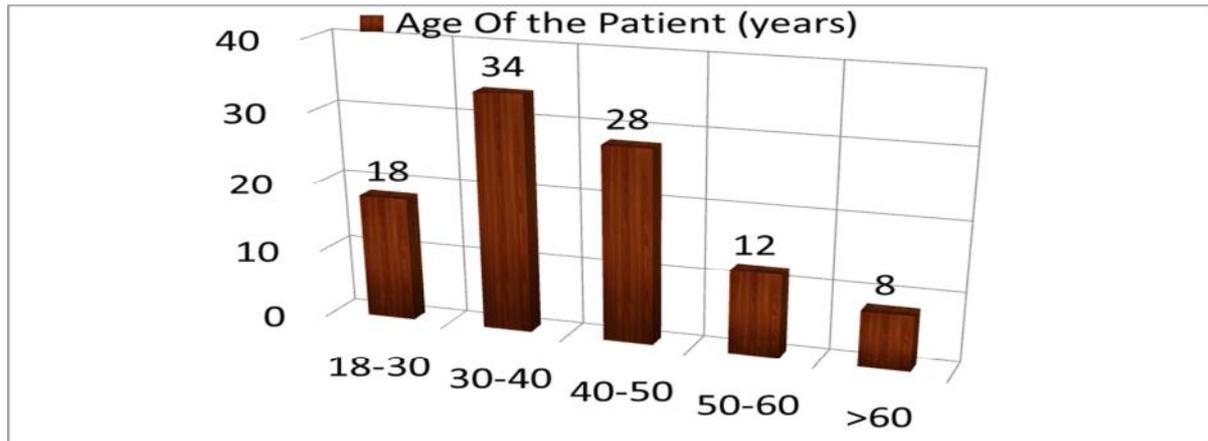


Figure 2: Age distribution of the studied cases.

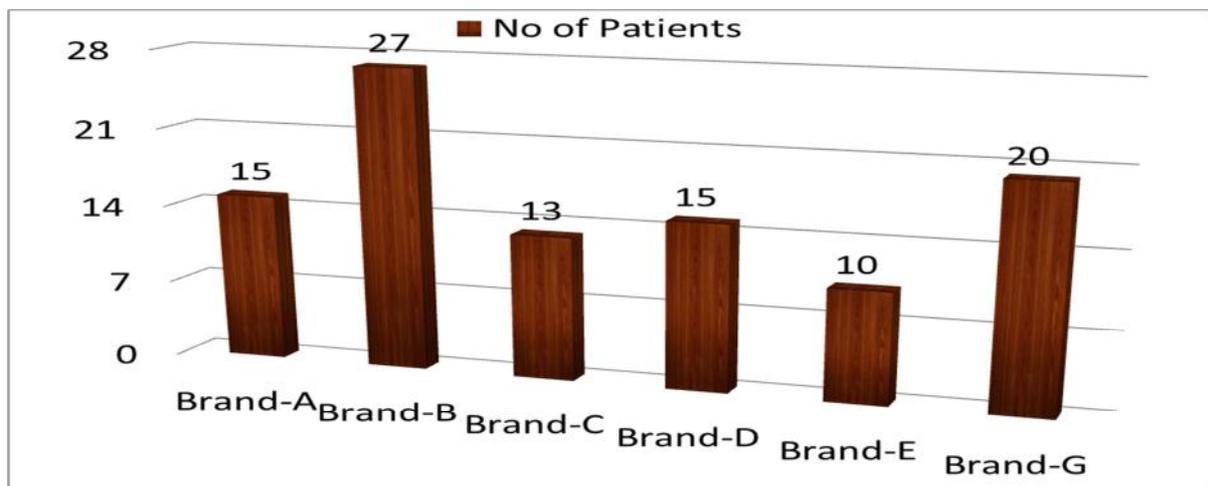


Figure 3: Number of patients prescribed Branded and Generic drugs.

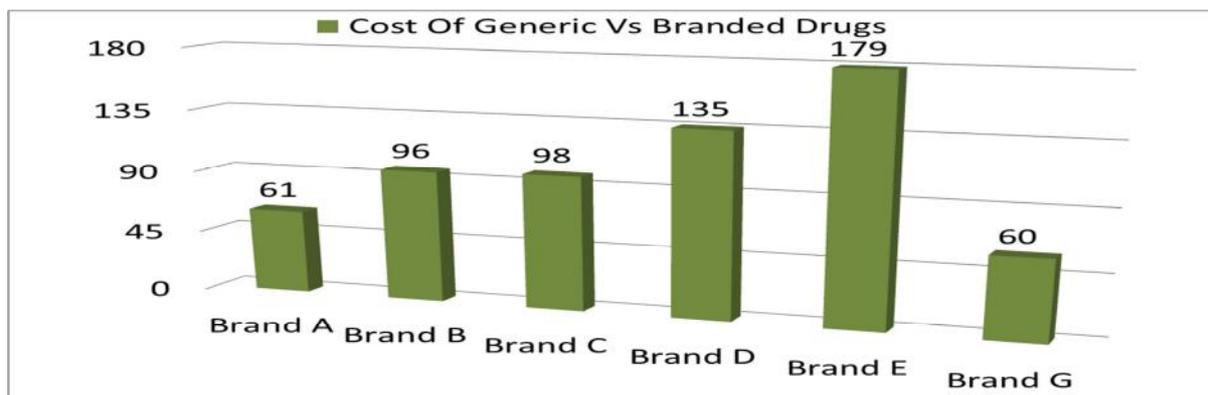


Figure 4: Analysis of cost of single dose of Inj ceftriaxone 1gm Branded (Brand A-E) vs Generic (Brand G).

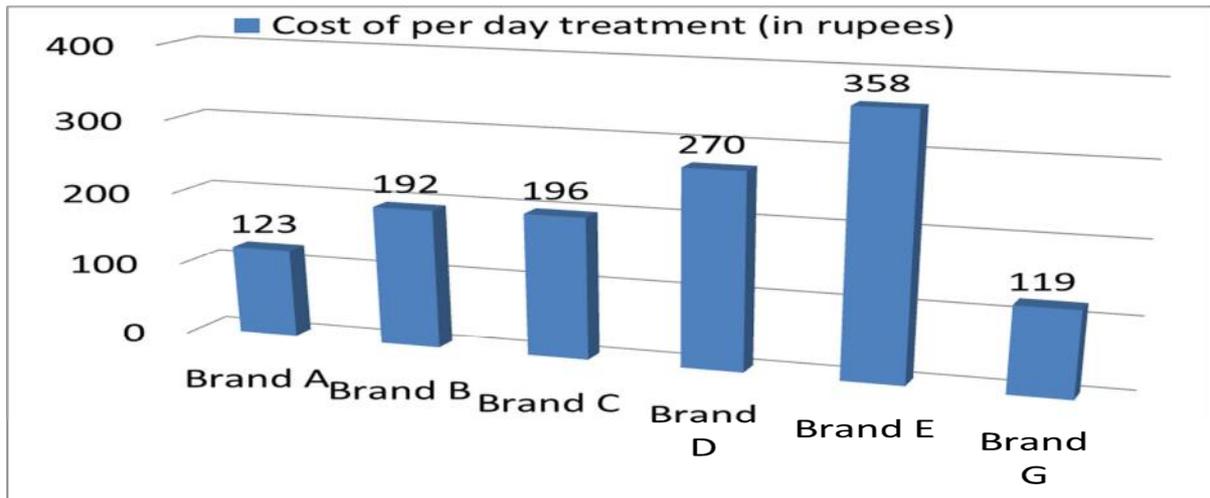


Figure 5: Analysis of daily cost of Inj ceftriaxone 1gm Branded (Brand A-E) vs Generic (Brand G).

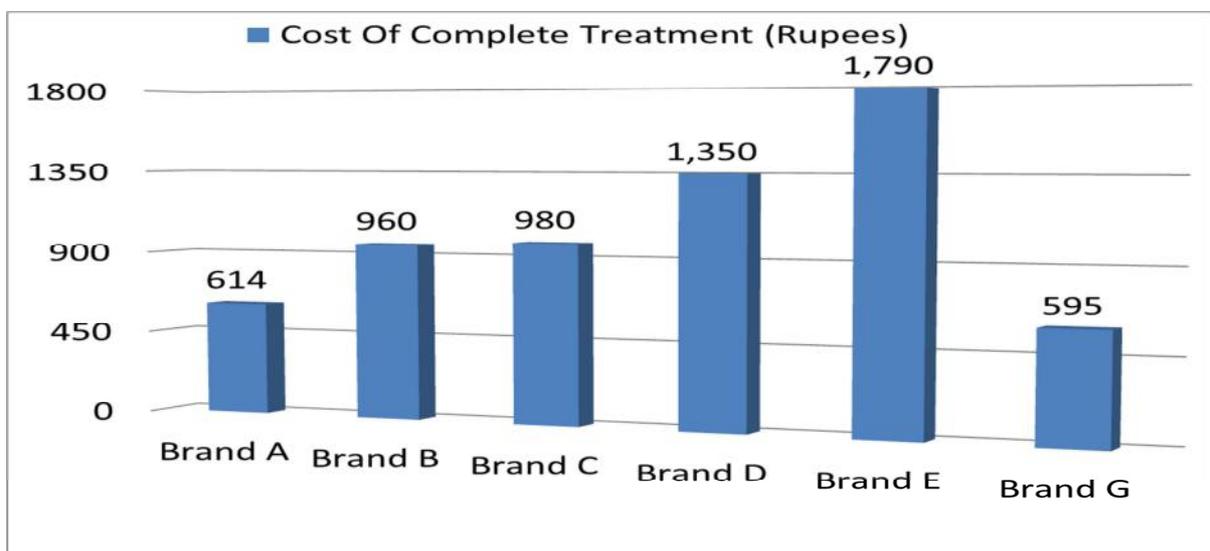


Figure 6: Cost of complete treatment by Branded (Brand A-E) and Generic (Brand G) ceftriaxone.

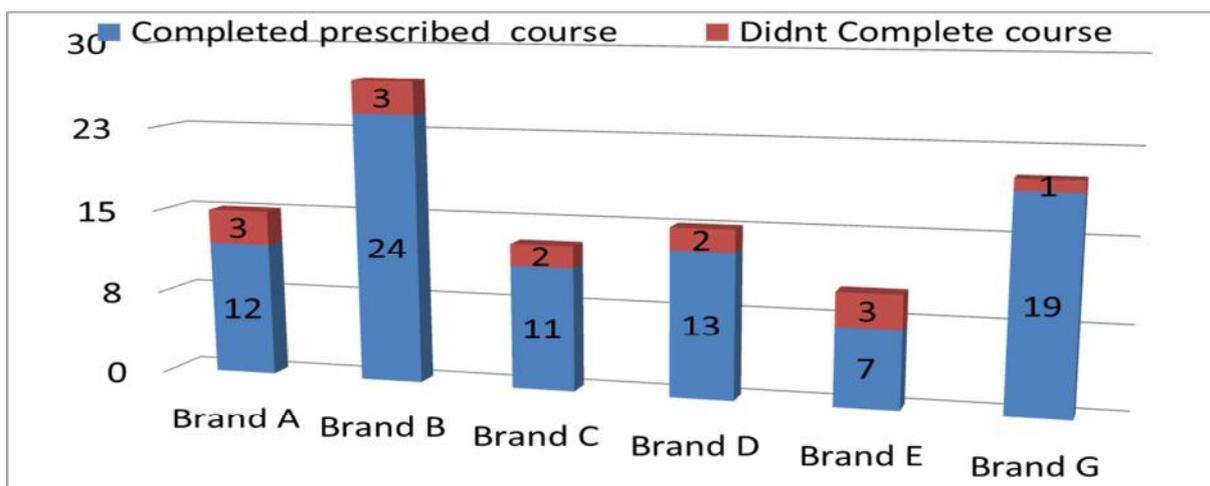


Figure 7: Analysis of patients depending upon whether complete or incomplete treatment was taken.

Analysis of complete treatment by inj ceftriaxone for the treatment of enteric fever revealed that there was a significant difference of total cost of complete

treatment by branded and generic drugs. While generic drugs costed least (Rs 595/-) brand E costed the most (Rs 1790). Owing to this huge discrepancy

in the cost of treatment between branded and generic drugs many patients who have been started on branded IV ceftriaxone didn't complete the prescribed 5 days of IV ceftriaxone and requested the treating physician to switch over to oral antibiotics [Figure 5, 6].

Analysis of whether the patient took complete treatment or not and its relation with whether that particular patient was prescribed either generic or branded drug revealed that maximum number of the patients who discontinued treatment before completion of prescribed course of antibiotics belonged to patients who have been prescribed Brand E (30%) while minimum number of patients who discontinued treatment before completion of prescribed course of antibiotics belonged to patients who have been pre-scribed generic IV ceftriaxone ie Brand G (5%) [Figure 7].

DISCUSSION

As the healthcare sector progresses there is definitely going to be an increase in the prescription of drugs. With increase in health awareness and availability of specialists at grass root levels and in small towns more and more non communicable diseases like diabetes, hypertension, autoimmune diseases and rheumatological disorders requiring prolonged treatment are being diagnosed at an early age. Early diagnosis means prolonged treatment and prolonged treatment means increase cost of medications. Pharmacoeconomics deals precisely with this aspect of drug prescription. It not only deals with the actual cost of a drug but its efficacy in treating a disease with respect to its rates.

Generic drugs by definition are equivalent to branded drugs in terms of bio-equivalence, strength, safety and efficacy.^[11] Generic drugs are relatively cheap in comparison with branded drugs. Despite this being the case many treating physicians hardly prescribe generic medicine.^[12] Reasons why physicians usually doesn't prescribe generic drugs include Physicians' and sometimes even patients' perception that the cheaper drugs means less effective drugs.^[13] Differences in size, shape, colour and name of the drug may lead to patient confusion, this is specially the case where a patient has already been on a drug since many years like antihypertensive or anti diabetic drugs.^[14] And there are sometimes a genuine requirement of continuing one specific brand of a drug like phenytoin when change of brand can lead to difference in bio-availability and consecutively there can be change in serum levels of the concerned drug which is not desirable.^[15]

Nonetheless it is important to use generic drugs whenever feasible specially in acute conditions. Use of generic drugs may reduce the cost of treatment. The apprehensions of the patients can be reduced by educating them about the possibility of them

receiving medications that look, taste or may be named differently but contain the exact same medication.

CONCLUSION

* As recommended by Medical council of india in code of ethics regulations 2002 all physicians should make a conscious effort to prescribe drugs by their generic names only.

* Even if a physician wants to prescribe branded drug then the branded drug which is most affordable should be prescribed (for example Brand-A in our study).

* Patients needs to be educated about the meaning of generic drugs.

REFERENCES

- Garrison GM, Oberhelman S. Screening For Hypertension Annually Compared With Current Practice. *Annals of Family Medicine*. 2013;11(2):116-121.
- Henry D, Lopert R. Pharmacoeconomics and policy decisions: the Australia health care system. *Clin Ther*. 1999 May;21(5):909-15.
- Ahuja J, Gupta M, Gupta AK, Kohli K. Pharmacoeconomics. *Natl Med J India*. 2004 Mar-Apr;17(2):80-3.
- Kesselheim AS, Avorn J, Sarpatwari A. The High Cost of Prescription Drugs in the United States: Origins and Prospects for Reform. *JAMA*. 2016 Aug 23-30;316(8):858-71.
- Tompkins RK, Wood RW, Wolcott BW, Walsh BT. The effectiveness and cost of acute respiratory illness medical care provided by physicians and algorithm-assisted physicians' assistants. *Med Care*. 1977 Dec;15(12):991-1003.
- Shargel L, Isadore K, editors. *Generic drug product development: solid oral dosage forms*. CRC Press; 2013.
- Shah US. Regulatory strategies and lessons in the development of biosimilars. In: *Pharmaceutical sciences encyclopedia*. Wiley; 2010.
- Shrank WH, Cox ER, Fischer MA, Mehta J, Choudhry NK. Patients' Perceptions Of Generic Medications: Although most Americans appreciate the cost-saving value of generics, few are eager to use generics themselves. *Health affairs (Project Hope)*. 2009;28(2):546-556. doi:10.1377/hlthaff.28.2.546.
- Gallelli L, Palleria C, De Vuono A, et al. Safety and efficacy of generic drugs with respect to brand formulation. *Journal of Pharmacology & Pharmacotherapeutics*. 2013;4(Suppl1):S110-S114.
- Medical council of india, code of ethics regulations 2002, <http://www.mciindia.org/RulesandRegulations/CodeofMedicineEthicsRegulations2002.aspx>.
- Alfonso-Cristancho R, Andia T, Barbosa T, Watanabe JH. Definition and Classification of Generic Drugs Across the World. *Applied Health Economics and Health Policy*. 2015;13(Suppl 1):5-11.
- Sicras-Mainar A, Navarro-Artieda R. Physicians' and patients' opinions on the use of generic drugs. *Journal of Pharmacology & Pharmacotherapeutics*. 2012;3(3):268-270.
- Plianbangchang P, Jetiyanon K, Suttaloung C, Khumchuen L. Physicians' generic drug prescribing behavior in district hospitals: a case of Phitsanulok, Thailand. *Pharmacy Practice*. 2010;8(3):167-172.
- Allenet B, Golay A. What are patients' attitudes towards generic drugs? The example of metformin. *Rev Med Suisse*. 2013 May 8;9(385):1005-9.

15. Privitera MD. Generic Antiepileptic Drugs: Current Controversies and Future Directions. *Epilepsy Currents*. 2008;8(5):113-117.

How to cite this article: Bhosle D, Sayyed A, Bhagat A, Shaikh H, Khan AA, Bhopale V, Quazi Z. Comparison of Generic and Branded Drugs on Cost Effective and Cost Benefit Analysis. *Ann. Int. Med. Den. Res.* 2017; 3(1):PC01-PC06.

Source of Support: Nil, **Conflict of Interest:** None declared