

Economic evaluation of controlled or uncontrolled generic substitution of medications in Epilepsy

Introduction

Healthcare institutions and government bodies are currently faced by the dilemma of including increasing healthcare costs in national budgets and meeting the demands of patients and pharmacies in terms of medications. Hence, generic substitution of drugs is getting more and more attention with the objective of reducing pharmaceutical costs by replacing patented expensive medications with generic drugs which have lower manufacturing and sale costs (Lieberman and Roebuck, 2010). This paper aims to understand if the use of generic medications for the treatment of epilepsy has any impact on total pharmaceutical expenses when evaluating economic outcomes. A systematic review was conducted of the published literature for epileptic patients using either non-generic or generic antiepileptic medications.

Methods

A systematic literature search was conducted using the database PubMed in December 2015. The terms used for the search included “generic substitution”, “drug substitution”, “epilepsy”, “antiepileptic drugs”, “cost containment”, “health economic”, and “economic evaluation”. The year limit for the selection of relevant studies was 2000 to 2015. Additionally, the reference list of all included studies was scanned to identify other studies that could be of relevance to the current review.

Only publications that were complete in every respect were chosen for this study. The studies were original research studies that focused on the economic outcomes of the generic substitution of antiepileptic medications. Some of the studies that came up in the search were

excluded on the basis of being in a non-English publication language, being reviews and not original research articles, not including clear economic outcomes, and the study design not being limited to the generic substitution of antiepileptic drugs.

All studies were classified on the basis of either generic substitution of antiepileptic drugs proving to be economically favorable or turning out to be more expensive than using branded medications. The first screening process included scanning the title and abstract of each study for relevance and presence of key terms used for the search. All studies that were left after the initial screening were read in detail to see if the methodology and results matched the objective of this review. Each study was then further analyzed in detail to understand the economic scenario of generic substitution of antiepileptic drugs and assign weightage to a particular hypothesis.

Figure 1: Flow chart of the study selection and finalization process.

Results

After eliminating duplicate articles, a total of 285 publications were obtained based on the search terms used. After the initial screening of titles and abstracts for relevance, a total of 203 articles remained. A total of 53 studies were excluded because they did not focus on antiepileptic drugs and/or economic outcomes of their generic substitution. Another 102 articles were excluded because they were not original research articles. Other exclusions involved not matching the study criteria and not providing relevant information for either proving or disproving the hypothesis. Hence, at the end of the screening and extracting process, a total of 8 articles remained, which were further analyzed in detail to understand the underlying themes.

Discussion

The prevalence of epilepsy, which is a common neurologic condition, is quite high in the populations living below the poverty line. According to recent statistics, there are at least 38% of epileptic people who are deprived of treatment due to the high costs. Also, epileptic patients are more at risk of developing secondary health problems such as respiratory diseases, and their management also puts a financial burden on the families. A survey conducted by the Centers for Disease Control and Prevention in 2000 found that the estimated annual cost of epilepsy

treatment is \$12.5 billion, attributing 86% to indirect epilepsy care and 14% to direct epilepsy care. The total antiepileptic medications that is sold to a single patient per year costs around \$25.41 as per a survey conducted in 2009 (Cardarelli and Smith, 2010).

According to a Government Accountability Office Report prepared in 2012, the rate of generic substitutions of antiepileptic drugs had reached 78%. Recent health plans are also focusing on incentivizing the use of generic drugs via low copayments and reimbursements based on recommendations for maximum pricing. According to a study conducted in 2013, a person covered with Medicaid is more likely to be prescribed a generic antiepileptic drug as compared to a person covered with private insurance (Mehr, 2013).

Due to issues such as low efficacy of antiepileptic drugs and drug resistance in epileptic patients, a number of researchers are trying to develop new drugs that can overcome problems of the current therapeutic options. However, in an age where medical treatments are quite expensive and low-cost generic versions of drugs are being introduced in the market, studies have found that patients are more likely to pay for generic versions of drugs rather than expensive new drugs whose efficacy and safety are yet to be established in larger patient populations (Ventola, 2014).

A number of healthcare policies have been designed by the World Health Organization (WHO) to fight the rising healthcare costs and one of them is focusing on the research relating to use of generic medications in epileptic patient populations. Reports by WHO have concluded that the overall healthcare industry can improve considerably if the use of generic medications is increased and the cost of medications is reduced. Given that about 20 – 30 % of the national budget is spent on healthcare, it is assumed that the systematic use of generics will greatly affect the overall costs of healthcare (Ergen, 2012).

The substitution of non-generic medicines with generic medicines for the treatment of epilepsy is widely regarded as a means to reduce healthcare costs, both in the primary and secondary health sectors. Physicians are often provided with technology to help them identify the generic counterparts of the non-generic drugs they prescribe for treatment. In some parts of the world, pharmacists are also encouraged to provide generic drugs instead of the non-generic drugs written on the prescriptions. This has led to widespread use of generic medicines leading to effective healthcare budgeting by the governments (Feely et al., 2005).

A number of studies have shown that generic formulations lead to a large amount of cost-effectiveness in epileptic patients. Studies have compared individual costs of one tablet of a generic formulation and one tablet of a substitutable brand formulation and found that in case of 600 mg of oxcarbazepine taken two times daily, the annual cost of the generic formulation is 28 % lesser than its branded counterpart. Similarly, in the case of 400 mg of zonisamide taken daily, the annual cost of the generic formulation is 34 % lesser as compared to its branded formulation. Both these percentages have been obtained in studies conducted for internet sales of medicines. However, it has been documented that though the annual cost of generic medications is lower than branded medications, other costs such as hospitalizations and outpatient costs are significantly higher for patients on generic medications. It is still not clear if the use of generic medications in particular contribute to healthcare costs or if there is some other underlying issue contributing to this increase in utilization of healthcare resources (Shaw and Hartman, 2010).

On the other hand, there are also reports saying that use of generic drugs for the treatment of epilepsy leads to greater medical expenses annually. In a study conducted by Labiner et al. which surveyed 33,000 epileptic patients found that patients receiving generic substitutions of antiepileptic drugs like carbamazepine, phenytoin, primidone, gabapentin, and zonisamide spent

almost \$3000 more on medical costs as compared to those who were on non-generic drugs. These costs include outpatient and Emergency Room visits, outpatient pharmacy usage, and inpatient costs. Another study conducted by Erickson et al. found that patients who were on generic substitutions of lamotrigine and divalproex were more likely to discontinue their medications, have their dosage changed, or use additional therapies for epilepsy. It has also been seen that patients who are on generic medications have a 44% higher risk of getting hospitalized, thus further increasing medical expenses (Mehr, 2013).

In a study conducted by LeLorier et al. in 2008, the economic benefits of using the generic substitution of the antiepileptic drug lamotrigine was examined in 671 patients. They found that despite the fact that generic medications costed lesser than the original branded products, the overall medical expenses for epileptic patients in the management of their condition were higher than those using the non-generic medications. People on generic medications were more likely to use different healthcare facilities, including more consultation appointments and greater hospitalization numbers (LeLorier et al., 2008).

Another study analyzed the medical expenses of patients on antiepileptic drugs on the basis of their stability and found that healthcare costs for stable and unstable patients, epilepsy treatment and treatment for comorbidities, and incidental injuries was higher for patients using generic medications. Also, the percentage of patients requiring additional healthcare was more for patients on generic medications than on non-generic drugs. The explanation for this trend is dose fluctuations that lead to instability in epileptic patients. Another possible explanation could be that people who choose to use low-cost generic drugs usually have an overall poor health status and hence, are more in need of additional healthcare facilities and resources (Mintzer, 2011).

Conclusion

In conclusion, an extensive systematic review was conducted to identify if there are any economic benefits of using generic antiepileptic drugs rather than branded medications. Of all the publications included in this study, there were a few that described the current trends in the use of generic medications and reasons which motivate patients, doctors and pharmacists to do so, some studies focused on the cost-effectiveness of using generic medications instead of branded formulations, and other studies threw light on the fact that people on generic medications were more likely to use more healthcare facilities and visit the hospital more often. There is still a lot of controversy going on in this field and doctors and scientists are in two minds regarding the use and economic benefits of using generic antiepileptic medications. The number of studies in this field are quite few to come to any reasonable conclusion and more number of studies with larger and more diverse patient populations in different parts of the world are required to understand the economic dynamics of using generic medications.

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