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Research Article

Cost Variation Analysis of Various Brands of Anti-Depressants Agents Currently Available in Indian Markets

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Abbreviations: DPCO: Drug Price Control Odder; NPPA: National Pharmaceutical Pricing Authority

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Abstract

Depression is a mental, psychiatric medical condition or disorder in which individuals manifest some clinical syndrome characterized by sadness, mood swings, societal withdrawal, lack of interest, family issues, and education problems which affect the daily student life in which the individual does not participate in daily activities. Sometimes individual commits suicide due to exam stress and that swings the mood upon the condition of the individual. The cost of brand-name medications prescribed in such circumstances exacerbates the disease burden and may even result in noncompliance with therapy. IDR (Indian Depository Receipt) was used to calculate the cost of various antidepressant drug brands. Using the percentage cost ratio, one can ascertain the price of each brand's 10 tablets in INR (Indian Rupees), the cost ratio, and the percentage cost variance. The difference between the greatest and lowest prices of the same drug produced by Indian pharmaceutical industries was calculated. There is a greater price disparity between agents on the market. The greatest expense variance was found to be amitriptyline 25 mg (195%), fluoxetine 50 mg (95%), sertraline 50 mg (83%) and the lowest % cost variation was of fluvoxamine 20 mg (13.8 mg), duloxetine 20 mg (16%) and escitalopram 10 mg (38%). On the Indian market, the average price disparity between antidepressant medications of various brands is quite high. If a pricey brand is prescribed, patients will incur additional costs.

Introduction

Depression is a mental disorder that affects the mind. It is estimated that 59% of adults suffer from melancholy worldwide [1,2]. Depression is characterized by persistent sadness and a loss of interest or enjoyment in formerly rewarding or pleasurable activities [3,4]. Symptoms of major depression include a depressed mood, loss of interest and delight, low energy, and feelings of remorse, among others. It may be a unipolar or bipolar cyclic disorder, characterized by manic and depressive cycles [5,6]. The mood change may have a psychotic basis with delusional overthinking or occur in isolation and induce anxiety that may lead to depression [7-9]. Many antidepressant classes have become available in India throughout the years; some of these classes survived the test of time and are still in use, while others are no longer marketed or are no longer a favorite with physicians [10,11]. In general, antidepressant research in India has followed Western tendencies; nevertheless, some of the antidepressant medications that have been released haven't undergone as comprehensive of an evaluation as others [12-14]. The study of prescription patterns can assist in identifying prevalent practices of medication use in the real world. In India, the antidepressant prescription pattern has been investigated. The majority of previous Indian studies examining antidepressant prescription patterns only examined the pattern of antidepressant use in unipolar depression and the initial prescription administered to patients [15-17]. According to the World Health Organization (WHO), depression is a mood disorder and common mental disorder that affects individuals of all ages, races, ethnicities, and genders. Some varieties of depression, such as dysthymic disorder and major depressive disorder (MDD), which is the most studied form of depression, have been studied extensively [18-20].

Pathophysiology

Despite the fact that neurophysiology and neuropsychiatry research is advancing our understanding of the pathophysiology of depression, there is still much to learn [21,22]. Partially because depression is a heterogeneous disorder with complex phenomena and multiple potential etiologies, the precise mechanism by which depression

develops is incomplete [23-25]. The goal is to obtain a comprehensive understanding of the pathophysiology of a disease. In the case of depression, insufficient knowledge of pathogenesis helps to explain why certain interventions fail to produce the desired effect [26-28]. The biogenic amine hypothesis, disruption of the Hypothalamic-Pituitary-Adrenal (HPA) axis, and genetic and environmental variables are now accepted processes that try to explain the pathophysiology of depression [29]. The following are some of the medications used to treat depression [30]. Drugs used to treat depression include reversible MOA (monoamine oxidase) inhibitors such as moclobemide and clorgyline, selective serotonin reuptake inhibitors (fluoxetine, fluvoxamine, and paroxetine), and atypical antidepressants (trazodone, bupropion, and amoxapine) [31].

The treatment of depression is a difficult task, as is the selection of a suitable substance to control mental disorders [32]. The cost of medications is an important aspect of health economics and plays a crucial role in care, particularly in developing nations. It is also an essential component of rational drug prescription that influences treatment adherence [33,34]. In India, the availability of antidepressants in a variety of dosage forms with varying labels and a significant price disparity generates a great deal of difficulty for physicians in choosing the least expensive medication for their patients [35]. Due to the increasing cost variation of antidepressant medications, there is a decline in patient compliance, which in turn diminishes their quality of life and increases their economic burden [36]. The awareness of the cost variation of antidepressant medications can be applied to more cost-effective treatment regimens to increase patient compliance and reduce therapy failure rates [37]. Due to the paucity of literature on the cost-effective analysis of antidepressant drugs, there is a need for cost analysis of available formulations of antidepressant drugs in the practice of medicine; thus, this study was designed. This study aims to analyse the cost variation of various brands of anti-depressants drugs currently available in the Indian pharmaceutical market [38].

Methods

This was an analytical study (current index) that analyzed the maximum and minimum prices of antidepressant medications in all available strengths and dosage forms manufactured by various companies in India. The study included these drug formulations with identical potency, dosage, and number [39]. These medications are produced by various Indian pharmaceutical companies, and fixed-dose combinations were not considered. Using the percentage cost difference between the most expensive and least expensive antidepressant brands, further analysis was conducted [40]. We can determine how frequently the most expensive brand in each category is more expensive than the least expensive brand from this. Percentage cost variation was calculated as follows [41].

Cost variation (%) = (Maximum cost – Minimum cost) / Minimum Cost × 100%

Results

The costs of anti-depressant medications produced by various pharmaceutical companies were examined. The current investigation revealed a significant range in the highest and least cost of antidepressant medications produced by various Indian companies. The pricing of various brands of the same antidepressant agents varies substantially in the Indian market, as indicated in Table 1. The highest % cost variation was found for Amitriptyline 25 mg (195%), Fluoxetine 20 mg (95%), Sertraline 50 mg (83%), and the lowest % cost variation was for Fluvoxamine 20 mg (13.8%), Duloxetine 20 mg (16%) and Escitalopram 10 mg (38%) Figure 1.

Discussion

The study mentioned above shows a significant range in the maximum and cheapest cost of antidepressant medications. With the majority of anti-depressant medications, the cost variance as a percentage was greater than 100% Amitriptyline, and the price of various brands of the same anti-depressant medications on the Indian market varies significantly. Medication noncompliance is the most frequent cause of medication nonadherence, and it has been demonstrated to be related to higher drug costs. It has been found that up to 90% of depressed individuals are non-compliant. When depression is not treated as prescribed, the mental condition progresses, drastically raising the expense of overall medical care. The issue could be improved if the drug price is given more importance when pharmaceuticals are in drug price order. The National Pharmaceutical Pricing Authority (NPPA) and the Drug Price Order DPCO) are effective tools for regulating drug costs [42]. As per a previous study, it was found that a significant range in the costs of different antidepressant formulations. Their research found that only Escitalopram

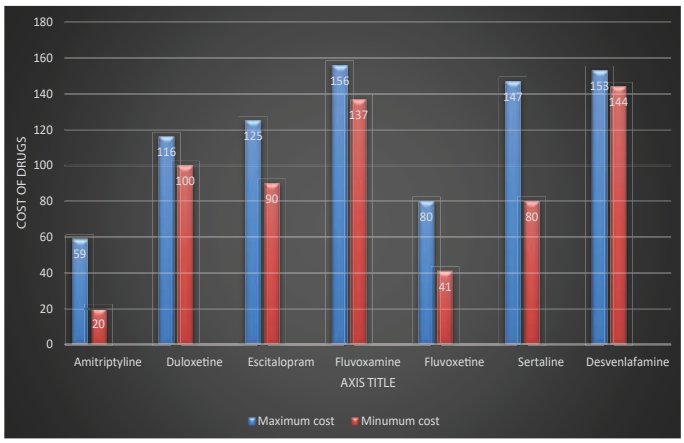

Figure 1: Cost difference [min and max] commonly used anti-depressants drugs used as single drug therapy. The maximum and minimum costs of drugs have been mentioned in the figure.

Table 1: Shows the price variation of anti-depression drugs. In this group, Amitriptyline showed a maximum price variation of 195%, while Fluvoxamine showed a minimum price variation of 13.8%.

Drugs	Composition	Company	Packing	MRP (Maximum Rate and Minimum Rate)	Ratio
Amitriptyline	25 mg	Indas Pharma	10	Max:59 Min:20	195%
Duloxetine	20 mg	Sun Pharmaceuticals Industries	10	Max:116 MIN:100	16%
Escitalopram	10 mg	Indas Pharma Indus.	10	Max:125 Min:90	38.80%
Fluvoxamine	50 mg	Sun Pharma Industries	10	Max:156 MIN:137	13.80%
Fluvoxetine	20 mg	Icon Life Industries	10	Max:80 Min:41	95%
Sertaline	50 mg	Torlent Pharma LTD	10	Max:147 Min:80	83%
Desvenlafaxine	50 mg	Sun Pharma Industries LTD	10	Max:153 MIN:144	60%

price fluctuation was investigated. In order to examine the price variance of antidepressant drugs accessible on the Indian market, research was created. The top 25 medications in our hospital system are listed here. In developing nations, patients are responsible for covering their own medical expenses [43,44]. In India, patients foot more than 80% of the bill for healthcare. The government should adopt a policy that allows for the reasonable and accessible pricing of branded and generic medications. The study's weakness is that the price variations in the parenteral antidepressant formulation were not examined [45]. The analysis excluded certain medications used to treat depression. Another study was performed by Tripathi et al., in the year 2018 and they found there are 15 medications with 63 formulations under 1173 brands produced by various pharmaceutical companies. According to the results of this study, there are many different brands of antidepressant medications on the market, and the prices of these medications vary greatly. As a result of their analysis, we came to the conclusion that the antidepressant medicine market in India has a wide range of prices and brand names. By prescribing medications with generic names rather than specific names, this variation could be reduced. Additionally, choosing medicine brands with modest maximum dosages will be appropriate financially. Among all the antidepressant drugs, the highest cost ratio and percentage cost variation were found for the fluvoxamine 100 mg which is 1:12. 274 and 1127. 495 followed by amitriptyline 50 mg [1:5.558 and 455.813], which is similar to our study.

Conclusion

The above study depicts more variation in the various prices of different brands of the same anti-depressants drugs presently available in the Indian market. Increased adherence to the therapy can be ensured by decreasing the price of therapy by changes in government policies and regulations and creating awareness among curing physicians for switching to cost-effective therapy and thus help in rational prescribing.

Prescribing medications should be given greater emphasis among practitioners and also spreading awareness that cheaper medicines are not inferior to costlier branded counterparts. Financial constraints are a reality in almost all aspects of medical doctors have to consider the price of medications to their patients. Patients are adversely affected by raising medication costs given the increasing prescribing, taking into account prescription costs.

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Authors contributions: Author's contributions this study are: KRA: main author, design, methodology and writing, M: coordination and design.

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