



Original Research Article

A big divide in prices of lactobacillus preparations in India

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ABSTRACT

Introduction: There exists a wide range of variation in the prices of drugs marketed in India and other parts of the world. In the Indian market, various probiotic drugs of different brands, different combinations and different dosage forms are available.

Aim & Objectives: To evaluate the cost of Lactobacillus combinations of different brands of one dosage form and difference in cost of different brands of the same dosage form by calculating the percentage variation of cost.

Materials and Methods: The retail cost of different Lactobacillus combinations being manufactured by different companies, in the same dosage form was compared. The difference in the maximum and minimum price of the same dosage form manufactured by different pharmaceutical companies was calculated and the percentage variation in price of same dosage form was calculated.

Results: Among Lactobacillus combinations of different dosage forms, the percentage variation in price of powder form, tablet form, capsule form and liquid dosage form were 380.7%, 578.5%, 3446.6% and 338.3% respectively.

Conclusion: The average percentage price variation of different brands of Lactobacillus combinations of the same dosage form manufactured in India was very wide. The appraisal and management of selling drugs should be directed towards maximizing the advantages of therapy and minimizing negative personal and economic outcomes.

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1. Introduction

In the developing countries like India, the price of marketing drugs is a major concern to both physician and patient and also very limited data available on prescribing patterns and expenditure. Cost of drugs is an important factor influencing compliance with treatment.¹

In the background of pharmaceutical and other health products, differential pricing (also known as tiered pricing) is the adjustment of product prices to the purchasing power of consumers in different geographical or socioeconomic sections. This differential pricing could be a very effective strategy to improve access to essential medicines in low and middle-income countries where most of the patients pay for medicines out-of pocket and therefore cannot afford the

prices compared to high income markets.²

The beneficial effects of food with added live microorganisms and in particular of milk products on children and other high-risk populations, are widely being promoted by the health professionals and pharmaceutical companies. It had been reported that these probiotics can play an important role in immunological, digestive and respiratory functions and could have a significant effect in alleviating infectious disease in children.³

The word “probiotic” derived from Greek, and it means “for life”. Professedly, it had been Ferdinand Vergin who invented the term “probiotic” in 1954, in his article titled as “Anti-und Probiotika” comparing the harmful effects of antibiotics and other antibacterial agents on the intestinal microbiota with the beneficial effects (“probiotika”) of some useful bacteria.⁴

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Results of clinical studies established the positive effect of probiotics on gastrointestinal diseases (e.g., irritable bowel syndrome, gastrointestinal disorders, *H. pylori* infection, inflammatory bowel disease, diarrhoeas) and allergic diseases (e.g., atopic dermatitis).⁴

Probiotic products may accommodate one or more selected microbial strains. Most of the microorganisms that are currently used in probiotic preparations belong to the following genus: Lactobacillus, Bifidobacterium, and Lactococcus, Streptococcus, Enterococcus. Moreover, strains of Gram-positive bacteria belonging to the genus Bacillus and some yeast strains belonging to the genus Saccharomyces are commonly used in probiotic products.⁵

There exists a wide range of variation in the prices of drugs marketed in India and other countries of the world. In the Indian market various probiotic drugs of different brands, different combinations and different dosage forms are available. This creates a problem with physician to make a decision the drug of choice for individual patients. Also in the literature very less studies are available which compare the cost of drugs of different brands. Regarding probiotic drugs, to the best of our knowledge there is no study available which compares the cost of drugs of different brands. So, we decided to carry out the study which compares prices of different probiotic drugs especially Lactobacillus combinations available in Indian market.

2. Aim

To evaluate the cost of Lactobacillus combinations of different brand names of one dosage form and the difference in cost of different brands of the same dosage form by calculating percentage variation of cost.

3. Objectives

This Pharmacoeconomic study is designed with the main objectives of,

1. To find different Lactobacillus probiotics available either singly or in combination and the number of the brands available for each.
2. To evaluate the cost of Lactobacillus combination of different brand names of one dosage form.
3. To evaluate the difference in cost of different brands of the same dosage form by calculating percentage variation of cost.

4. Materials and Methods

Our study was an observational and cross-sectional study, done in department of pharmacology of a teaching hospital in Mangalore. CIMS (current index of medical specialties)⁶ & IDR (Indian drug review)⁷ [2019 issues] were reviewed for the prices of different Lactobacillus combinations. All the brands of Lactobacillus combinations published in

CIMS & IDR were included in the study. Drugs with no price information were excluded.

1. The retail cost (in INR) of different lactobacillus combinations being manufactured by different companies, in the same dosage form was compared.
2. The difference in the maximum and minimum price of the same dosage form manufactured by different pharmaceutical companies was calculated.
3. The percentage variation in price of same dosage form was calculated.

The percentage variation in price was calculated using the following formula⁸

$$= \frac{\text{price of most expensive brand} - \text{price of least expensive brand}}{\text{price of least expensive brand}} \times 100$$

4.1. Analysis

Findings of my observational study were expressed as absolute numbers as well as percentages.

5. Results

The prices of a total of 48 different Lactobacillus formulations available in different dosage forms were analysed. With regard to various categories of Lactobacillus preparations analysed in our study, the maximum price variability was found to be highest with capsule form (3446.6%) and lowest with liquid dosage form (338.3%).

In powder form, among the Lactobacillus combinations SUPERFLORA-GG shows a maximum price of 45.00 and DAROLAC showed minimum price of 5.95 [Table 1]. The percentage variation in price of powder form was 656.3%. In tablet form, IMM-4 shows a maximum price of 95.00 and LAC-M showed minimum price of 14.00 [Table 2]. The percentage variation in price of tablet form was 578.5%. In capsule form, ECONOVA shows a maximum price of 532.50 and AGLAC showed minimum price of 15.00 [Table 3]. The percentage variation in price of capsule form was 3446.6%. In liquid dosage form, SUPERFLORA-GG DPS shows a maximum price of 263.00 and SPOLAB-DS showed minimum price of 60.00 [Table 4]. The percentage variation in price of liquid dosage form was 338.3%.

6. Discussion

To the best of our knowledge, there was no study done to evaluate the variability of prices of Lactobacillus preparations available in India. Our study for the first time analysed the variation of cost among different brands of Lactobacillus combinations available in the Indian market. Our study findings showed a really high fluctuation in the minimum and maximum price of Lactobacillus combinations which are being manufactured by several pharmaceutical industries across the world in different brands and in different dosage forms. The percentage

Table 1: Cost variation of Lactobacillus preparations available in oral powder form

Brand Name	Manufacturer Name	Price in INR (for 1gm)
Barotic	Baroda	27.00
Barotic-Z	Baroda	27.00
Gastrobact	Exeltis	14.60
Labifos sachet	Shield	10.00
Lactiflora	Dr. Reddy's	9.36
Lactisyn	Franco-Indian	9.70
Lactra	Intra labs	40.00
Ledefiy	Uvkan	30.00
Reflora kid	Sundyota	28.88
Remune-AL	Sundyota	29.27
Superflora-GG	Sundyota	45.00**
Terflora-Z	Gujarat terce	24.00
Vibact	USV	37.98
Vivagut kid	Indian immunologicals	25.00
Bifilac	Tablets	27.44
Brega	Jasbal pharma	27.00
Darolac	Aristo	5.95*
Prepro kid	Fourrts (premiere)	20.00
Vizyl	Unichem	19.20
% Variation in price= 656.3%		

*Minimum price, **Maximum price

Table 2: Cost variation of Lactobacillus preparations available in tablet form

Brand Name	Manufacturer Name	Price in INR (for 10 tab)
IMM-4	Biomax	95.00**
LAC-M	Madhav biotech	14.00*
Lactra	Intra labs	15.00
Lacven	Vensat	15.00
% Variation in price = 578.5%		

*Minimum price, **Maximum price

variation in the cost was above 100% with most of the commonly used Lactobacillus combinations in India.

In our analysis, we found that various Lactobacillus combinations are available in Indian market in the form of oral powder, tablets, capsules and also in liquid dosage form. In our study, we found that over 48 different brands of Lactobacillus preparations are available in the market. Out of 48, 15 were single preparations of Lactobacillus and the remaining 33 were the combinations of Lactobacillus with other probiotic strains. The commonly used strains for the combinations were *Saccharomyces boulardii*, *Streptococcus faecalis*, *Clostridium butyricum*, *Bacillus mesentericus*, *Bifidobacterium bifidum*, *Bifidobacterium longum*, *Streptococcus thermophiles*, and *Bacillus coagulans*. Various Lactobacillus species employed in the formulations were *L.sporogenes*, *L.acidophilus*, *L.plantarum*, *L.gasseri*, *L.fermentum*, *L.salivarius*, *L.rhamnosus*, *L.casei*, *L.paracasei*, *L.reuteri*, and *L.jensenii*.

The wide variation in the prices of different Lactobacillus preparations can be due to different strains of probiotics used in different strengths. Still, the price variation of

Lactobacillus preparations showed a wide margin, this may be due to large number of brands available in different dosage forms and in different strengths.

Similar studies on antihypertensive drugs, hypolipidemic drugs, oral antidiabetic drugs and oral antiplatelet drugs showed a significant price variation in different brands of the same drug.⁹⁻¹¹

India is a major exporting hub of medicines to various countries at a low cost, but faces the challenge of providing quality medicines at an affordable price for its own population. Currently, more than 100,000 formulations are available in Indian market but there is no system of registration of medicines. More than one pharmaceutical company sells a particular medicine under different brand names aside from the innovator company that has led to a greater price variation among the drugs marketed. These extensive variations in the prices of various formulations of the same drug have severe economic connotations in India. Unlike developed countries, people in developing countries pay the value of medicines out-of-pocket. In India, more than 80% of health financing is carried by patients.⁹

Table 3: Cost variation of Lactobacillus preparations available in capsule form

Brand Name	Manufacturer Name	Price in INR (for 10 cap)
Becelac-PB	Dr. Reddy's	112.00
Equipro	Candila	66.58
Floreva	Sundyota	285.05
Gutshell	Seashell lab	125.00
Labifos	Shield	99.00
Mankind's Gut OK CAP	Mankind (magnet)	100.00
Miflora-DS	Dewcare	140.00
Remune-AL	Sundyota	220.00
Superflora-GG CAP	Sundyota	45.00
V-PH	Exeltis	177.8
Vajulans	Fountil	165.00
Aglac	Agron rem.	15.00*
Bifilac	Tablets	99.50
Bifilac-HP	Tablets	160.00
Econova	Glenmark (G&G)	532.50**
Gutrite	FDC (Select)	70.00
Gutstar	Aurel	75.00
PNP	Shinto biotech	89.00
Prepro	Fourtts (premiere)	135.00
Purelact plus	Accilex	85.00
Utipro	Exeltis	107.37
Vizyl cap	Unichem	94.45
% Variation in price = 3446.6%		

*Minimum price, **Maximum price

Table 4: Cost variation of Lactobacillus preparations available in liquid dosage form

Dosage form	Brand Name	Manufacturer Name	Price in INR
Oral Dispersible Solution (50 MI)	Mankind'S Gut OK	Mankind (magnet)	100.00
Oral Drops (8 ml)	Superflora-GG DPS	Sundyota	263.00**
Syrup	Spolab-DS	Haledew	60.00*
% Variation in price = 338.3%			

*Minimum price, **Maximum price

Patients have to spend more amount unnecessarily if costly brands are prescribed by physicians. The economically cheaper brand of a same generic drug is scientifically proved to be in no way inferior to its costly counterpart.¹² Low socioeconomic segments frequently face a choice between buying medicines or buying food or other requisites due to limited resources and high pricing of the drugs. So medicine prices do matter. Ideally the drugs of cheaper brands should be prescribed to save the patients money and to enhance the drug compliance. In India, clinicians have trivial knowledge regarding the cost of different brands of the same drug. It is felt that physicians could provide better services and lower the costs of the medicines if information about the drug prices was readily available. Studies have shown that providing a manual of comparative drug prices elucidated with prescribing advice to physicians reduced their patient's drug expenses. Rational prescribing involves selecting the cost effective treatment for the benefit of patient. There is a need for collaborative

action from regulatory authorities, doctors, pharmacists and general public at large to address this issue of price variation of Lactobacillus combinations available in Indian market. The excess profit margins presently being shared by pharmaceutical traders must be passed on to consumers which is feasible and economically viable.⁹

Drug price control order (DPCO) is an order issued by the government of India to fasten the price of drugs. Once a medicine is brought under DPCO, it cannot be sold at a price higher than that fixed by the government (DPCO). Currently there are 851 medicines are under DPCO list, 2018 but there are no probiotics in that list.¹³

Now a days many physicians are prescribing Lactobacillus combinations to improve intestinal microbiota to treat various diseases.³ Hence, it is desired that the government should bring at least some of the probiotics under price control.

Government of India has opened generic drug stores across the country that sell generic medicines manufactured

by the public sector companies. The quality of generic medicines available on these stores at low prices should be tested and compared with the popular branded drugs and results should be widely published. Studies involving the comparative evaluation on quality of branded and their generic counterparts could also be made mandatory for the generic manufacturer and their reports should be made public to market generic use and prescription.⁹

7. Conclusion

Our study findings showed a wide variation in the prices of different brands Lactobacillus preparations available in Indian market. There is a strong need to create awareness about this huge price variation among the general public, healthcare providers, healthcare payers, government agencies, policy makers and pharmacists for appropriate intervention to reduce economic burden on patients as well as healthcare system. Results of our study make the prescribers informed about various brands and their price variations. So the prescriber can choose the cost effective Lactobacillus preparation for a patient to achieve rational prescribing.

8. Source of Funding

Nil.

9. Conflict of Interest

There are no conflict of interest.

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