# Cost analysis study of oral hypoglycemic agents available in Nepalese market

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## ABSTRACT

**Introduction:** Diabetes Mellitus is one of the major causes of morbidity, mortality and needs lifelong treatment. There is a wide range of variation in the prices of antidiabetic drugs marketed in Nepal. Thus, a study was planned to find out price variations in the oral hypoglycemic drugs available singly and number of manufacturing companies for each, also to evaluate the difference in cost of different brands of same active drug by calculating percentage variation of cost.

**Methods:** Cost of a particular drug being manufactured by different companies, in the same strength and dosage forms was obtained from the price list provided by the pharmaceutical companies in Nepal and Indian Drug Review September 2013. The difference in the maximum and minimum price of the same drug manufactured by different pharmaceutical companies and percentage variation in price was calculated.

**Results:** Percentage price variation of the commonly used drugs found was metformin(500mg) 171.42%,metformin(850mg)128.42%,metformin(1000mg)80%,pioglitazone(15mg)150% pioglitazone(30mg) 188.89% ,sitagliptin(50mg) 33.33%,sitagliptin(100mg) 40% acarbose(25mg) 39.58%,acarbose(50mg)32.60%,gliclazide(80mg)108%,gliclazide(40mg)83.33%,glibenclamide(2.5mg)87%,glibenclamide(5mg),80%,glimiperide(1mg)91.67%,glimiperide(2mg)300%,glimiperide(3mg) 100% ,glimiperide(4mg) 36.84%.

**Conclusions:** The average percentage price variation of different brands of the same oral hypoglycemic drugs manufactured in Nepal is very wide. The appraisal and management of marketing drugs should be directed toward maximizing the benefits of therapy and minimizing negative personal and economic consequences.

**Keywords**: price variation; oral hypoglycemic drugs; Brands.

## INTRODUCTION

Pharmaceutical Industry in Nepal has grown with tremendous pace in last decade and Nepalese markets are flooded with a huge number of branded formulations with large difference in the

manufacturing cost of drugs and their maximum retail price and the cost of different brands of the same formulation. This apart from creating confusion among innocent consumersoften allows them to be misled by unfair traders. Prices of prescription can affect users,suppliers and most importantly payers in health care system. In fact, several studies have indicated that therapeutic compliance is influenced by drug prices.[1]

Thus; the cost of therapy may be a barrier incontrolling high blood glucose level and should be an important consideration in selecting hypoglycemic drugs.

Management of type 1 diabetes mellitus depends mainly on insulin,whereas the oral hypoglycemic drugs

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(OHDs) are the first line treatment for type 2 diabetes mellitus.Diabetes is one of the most expensive diseases as far as treatment is concerned, as it generates higher health care expenses than the individuals with normal blood glucose level. On average a person spends 20% of his /her income for treatment of diabetes per year.[4]

The current study aims to project a representative view of the existing situation of oral hypoglycemic drugs by collecting data about the cost of common oral hypoglycemic drugs available singly, number of manufacturing companies for each and to evaluate the difference in cost of different brands of same active drug by calculating percentage variation of cost.

## METHODS

This was a cost analysis study done in Nepali Market. Cost of a particular drug (cost per 10 tablets) in the same strength and dosage forms being manufactured by different companies was obtained from the price list provided by the pharmaceutical companies in Nepal as well as from "Indian Drug Review" (IDR) September 2013 for the drugs available in Nepalese market but manufactured by Indian pharmaceuticals.

The drugs being manufactured by only one company or being manufactured by different companies; however, in different strengths were excluded.

Difference between the maximum and minimum cost of the same drug manufactured by different pharmaceutical companies was calculated.

Percentage cost variation[1] was calculated as follows:

$$\%\text{cost variation} = \frac{\text{Max cost} - \text{Min cost}}{\text{Min cost}} \times 100$$

## RESULTS

The prices of a total of 7drugs belonging to 5 different classes, available in 17 different formulations were analyzed. These 17formulations are manufactured by different pharmaceutical companies.

Table 1 shows the price variation of a few commonly used oral hypoglycemic drugs used as a single drug therapy. Overall glimiperide (2mg) shows maximum price variation of 300%, while acarbose(50 mg) shows minimum variation of 32.60% . The maximum and minimum percentage price variation respectively for Biguanide:- metformin (500mg) 171.42%, metformin (850mg), 128.42%, metformin (1000mg) 80%. Sulfonylureas: gliclazide (40mg) 83.33% glicazide (80mg) 108%, glibenclamide (2.5mg) 87%, glibenclamide (5mg) 80%, glimiperide (1mg) 91.67, glimiperide (3mg) 100%, glimiperide (4mg) 36.84%. Thiazolidinediones: pioglitazone (15mg) 150% and pioglitazone (30mg) 188.89%. Gliptins: sitagliptin (50mg) 33.33% sitagliptin 100mg (40%) andalpha glucosidase inhibitors: acarbose (25mg) 39.58%

**Table 1.**Cost variation of different oral hypoglycemic drugs

| Drug | Formulation | Doses | Manufacturing Companies | Max.Price NPR (10 Tablets) | Min.Price NPR (10 Tablets) | % price variations |
|---|---|---|---|---|---|---|
| Biguanides | | | | | | |
| Metformin | 3 | 500mg | 31 | 38 | 14 | 171.42 |
| | | 850mg | 24 | 40 | 17.5 | 128.57 |
| | | 1000mg | 10 | 64 | 35 | 80 |
| Sulfonylureas | | | | | | |
| Gliclazide | 2 | 40mg | 11 | 55 | 30 | 83.33 |
| | | 80mg | 13 | 104 | 50 | 108 |
| Glibenclamide | 2 | 2.5mg | 2 | 13 | 7 | 87 |
| | | 5mg | 4 | 20 | 12 | 80 |
| Glimiperide | 4 | 1mg | 20 | 75 | 9 | 91.67 |
| | | 2mg | 20 | 140 | 35 | 300 |
| | | 3mg | 6 | 140 | 70 | 100 |
| | | 4mg | 4 | 130 | 95 | 36.84 |
| Thiazolidinediones | | | | | | |
| Pioglitazone | 2 | 15mg | 5 | 80 | 32 | 150 |
| | | 30mg | 5 | 130 | 45 | 188.89 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gliptins | | | | | | |
| Sitagliptin | 2 | 50mg | 4 | 400 | 300 | 33.33 |
| | | 100mg | 4 | 700 | 500 | 40 |
| Alpha glucosidase inhibitors | | | | | | |
| Acarbose | 2 | 25mg | 2 | 67 | 48 | 39.58 |
| | | 50mg | 3 | 122 | 92 | 32.60 |

(NPR:-Nepalese Rupees)

## DISCUSSION

Nepalese market is predominantly a branded generic market i.e., more than one company sells a particular drug under different brand names apart from the innovator company. Hence, the number of pharmaceutical products available in the market also is very high. This situation has led to greater price variation among drugs marketed.

Very few studies are available in Nepalese scenario, which compare the cost of drugs of different brands. Therefore, it was decided to carry out the study which compares the cost of different brands of drug of one of the most common disorder. The drug prices available in price list provided by pharmaceutical companies in Nepal and inIndian drug review were comparedas they are readily available source of drug information and are updated regularly. Drugs used in the management of diabetes type2 were selected as it is one of the major causes of morbidity and mortality, and the treatment requires continuous drug use.Findings reveal that the prices of most of the oral hypoglycemic drugs have percentage price variation around100%, which is not acceptable situation for patients.

Of 7drugs studied, most of which are commonly prescribed, percentage price variation is fairly wide leading to unfair burden on the consumer.In Nepal, patients are paying out of their pockets for their medical bills and are not covered by insurance schemes unlike developed countries.[7]In this situation, it is prudent to revisit the costing mechanisms and the huge difference between the pricing of brands have to be regulated by concerned agencies. It is felt that physicians could provide better services and reduce costs of drugs if the information about drug prices was readily available. Studies haveshown that providing a manual of comparative drug prices annotated with prescribing advice to physicians reduced their patients' drug expense.[9]

Currently, very few medicines are under drug prices control order. Hence, it is desired that the Government should bring all lifesaving and essential medicines under price control

## CONCLUSIONS

Thus, this study highlights that there is a huge price variation among the oral hypoglycemic drugs manufactured by different companies. Some measures must be taken by the Government to bring about the uniformity in the price. It will help to reduce the economic burden on the patients to some extent.

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