



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203




Human Journals

Research Article


September 2019 Vol.:16, Issue:2

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Pharmacoepidemiology and Economic Study in Endocrinological Disorders



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals



ISSN 2349-7203

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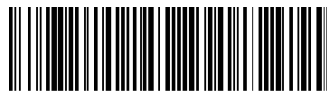
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Submission: 23 August 2019
Accepted: 28 August 2019
Published: 30 September 2019

Keywords: Epidemiology study, Economic study, Endocrinological disorders, Cost utility.

ABSTRACT

The pharmacoepidemiology and economic study on endocrinological disorders was done by using Randomized Retrospective method. Both inpatients and outpatients included in this study which was conducted for a period of 6 months at private Hospital. The data entry form was specially designed for this study. Data form was used to collect the patient details. Then the patient those who were suffering from endocrinological disorders and segregated based on the disease and concluded that the major population was affected by diabetes mellitus compared to hormonal imbalance and thyroid disorders on endocrinological disorders.



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INTRODUCTION

PHARMACOEPIDEMIOLOGY

Pharmacoepidemiology is the study of uses and effects of drugs in well-defined populations. Pharmacoepidemiology is the bridge between both pharmacology and epidemiology. Pharmacology is the study of drugs and their actions. Epidemiology is the study and analysis of the distribution and determinants of health and diseases conditions in defined population.¹

PHARMACOECONOMICS

Pharmacoeconomic is the scientific discipline that evaluates the clinical, economic and humanistic aspects of pharmaceutical products, services, and programmes, as well as other health care interventions to provide health care decision makers, providers and patients with valuable information for optimal outcomes and the allocation of health care resources. In simple terms, pharmacoeconomic is a tool to help health care decision makers determine with a drug is “Worth the Price”. Pharmacoeconomic methods include Cost of illness evaluation, Cost benefit analysis, Cost minimization analysis, Cost effective analysis, Cost utility analysis and any other analytic technique that provides valuable information to health care decision makers for the allocation of scarce resources.¹

Cost utility analysis is the method for comparing treatment alternatives that integrates patient preferences and Health Related Quality Of Life (HRQOL). It is similar to cost effectiveness analysis in that the costs are measured in monetary units and there is a defined outcome. But here the outcome is a unit of utility (e.g. a QALY). Example: Cost per Quality-adjusted life year (QALY) of coronary artery bypass grafting versus cost per QALY for erythropoietin in renal disease. In practice this is not so easy since the QALY is not a well-defined fixed unit.

Cost Effective Analysis is often used loosely to refer the whole of economic evaluation, but should properly refer to a particular type of evaluation. The health benefit can be defined and measured in natural units while the costs are measured in monetary units. It, therefore, compared the therapies with qualitatively similar outcomes in a particular therapeutic area.

Cost effective analysis is the most commonly applied form of economic analysis in the literature, and especially in drug therapy. It does not allow comparisons to be made between to totally different areas of medicine with outcomes. Cost Minimization Analysis involves

measuring only cost usually only to the health service and is applicable only where the outcomes are identical and need not be considered separately. An example would prescribe a generic preparation instead of the brand (lower cost but same health outcomes). Cost Benefit Analysis is measured as the associated economic benefit of intervention and hence both costs and benefits are expressed in money. Cost benefit analysis may ignore many intangible but very important benefits not measurable in monetary units. This approach is widely used in health economics.¹

ENDOCRINOLOGY

Endocrine is a pertaining to hormones and the glands that makes and secrete them into the bloodstream through which they travel to affect distant organs. Endocrinology is a branch of biology and medicine dealing with the endocrine system, its diseases and its secretions.

Endocrine sites include the hypothalamus, pituitary gland, pineal gland, thyroid testes, and the ovarian follicle. There are many different types of endocrine disorders. Diabetes is the most common endocrine disorder. Other endocrine disorders include thyroid disorder, hormonal dysfunctions, adrenal insufficiency, and Cushing's disease.²

Hence, an endocrinology disorder was most commonly found in General Medicine Department that includes Diabetes Mellitus, Hypothyroidism and Hormonal imbalance. So, it is very vital in the management of endocrinology disorders. So in this study pharmacoepidemiology status and drug utilization for endocrinology disorders was making to the sense of public population for the awareness of endocrinology disorders.

MATERIALS AND METHODS

Pharmacoepidemiology and economic study of endocrinological disorders" was conducted in the department on General Medicine at a private hospital. A total of 181 patients who affected by endocrinology disorder were selected for the study and the data entry form was specially designed for this study.

Data entry form was used to collect the patient's details. Then patient those who were suffering from endocrinological disorders and segregated the based on the disease (Diabetes Mellitus, Thyroid Disorders and Hormonal Imbalance). For this study data's were collected from the Medical Record Department at private hospital. The collected data was converted to

percentage and compared. And reported the Epidemiology analysis and Economic study on Endocrinological Disorders.

RESULTS

The present study was an attempt to understand the pharmacoepidemiology and economic study on endocrinological in a private hospital. The total number of patients in this study site during the study period was found to be 181.

Gender Distribution

Table No. 1. Gender distribution among the study population (n=181).

Sr. No.	Gender	No. of Patients	Percentage (%)
1.	Male	77	42.54
2.	Female	104	57.46
3.	Total	181	100

Age Distribution

Table No. 2. Age distribution of patients with endocrinological disorders (n=181).

Sr. No.	Age in years	No. of Patients	Percentage (%)
1.	20-30	30	16.57
2.	31-40	35	19.34
3.	41-50	34	18.78
4.	51-60	39	21.55
5.	>60	43	23.76

Epidemiology Analysis on Endocrinological Disorders

Table No. 3. Epidemiology analysis on endocrinological disorders (n=181).

S.No	Disease	No. of Patients	Percentage (%)
1.	Diabetes Mellitus	72	39.78
2.	Thyroid Disorder	50	27.62
3.	Hormonal Imbalance	59	32.60

Epidemiology Analysis on Combinations of Endocrinological Disorders

Table 4. Combinations of endocrinological disorders

S. No.	Disease	No. of Patients	Percentage (%)
1.	Diabetes mellitus along with Thyroid disorder	43	64.18
2.	Diabetes mellitus along with Hormonal imbalance	15	22.39
3.	Thyroid disorder along with Hormonal imbalance	9	13.49

Drug Used For Management of Thyroid Disorder

Table No. 5. Cost of drugs used for Thyroid Disorders (n=50).

S.No	Drug Name	No. of Patients prescribed	Cost/Container		Cost for 180 days		Patients Benefit (Rs)
			Brand A (Rs)	Brand B (Rs)	Brand A (Rs)	Brand B (Rs)	
1.	Thyroxine sodium	21	123	98	221.4	176.4	45
2.	Levothyroxine	29	55	138.90	99	250.2	151.2

Drugs used for the Management of Hormonal Imbalance

Table No. 6. Cost of drugs used for Hormonal Imbalance (n=72).

S.No	Drug Name	No. of Patients prescribed	Cost/Container		Cost for 180 days		Patients Benefit (Rs)
			Brand A (Rs)	Brand B (Rs)	Brand A (Rs)	Brand B (Rs)	
1.	Norethisterone	28	53	69.26	957.6	1,247.4	289.8
2.	Levonorgestrel + Ethinylestradiol	44	94	62.16	806.4	533	273.4

Drugs Used For the Management of Diabetes Mellitus

Table No. 7. Cost of drug used for Diabetes Mellitus (n=59)

S.No	Drug Name	No. of Patients prescribed	Cost/Strip		Cost for 180 days		Patient Benefit (Rs)
			Brand A (Rs)	Brand B (Rs)	Brand A (Rs)	Brand B (Rs)	
1.	Metformin	13	16.95	13.83	610.2	497.9	112.3
2.	Metformin + Glimepiride	11	157.60	108.10	3,783.6	2,595.6	1,188
3.	Glimepiride	9	18.3	29	658.8	1,044	385.2
4.	Metformin + Glimepiride + Voglibose	8	160	186.15	5,760	6,701.4	941.4
5.	Pioglitazone + Metformin	12	87.90	35.03	3,164.04	1,261.08	1,902.96
6.	Soluble Insulin 50% + Insulin Isophane 50%	6	169.04	126	30,427.2	22,680	7747.2

DISCUSSION

Pharmacoepidemiology is the study and analysis of the distribution and determinants of health and disease conditions in defined populations. Pharmacoeconomic is the scientific discipline that evaluates the clinical, economic and humanistic aspects of pharmaceutical products, services and programmes. Endocrine is a pertaining to hormone and the glands that makes and secrete them into the bloodstream through which they travel to affect distant organs. There are many different types of endocrine disorders includes Diabetes Mellitus, Thyroid Disorders, Hormonal Dysfunction, Adrenal Insufficiency and Cushing’s disease.¹According to our study 181 cases were collected and categorized as gender, age, disorders. According to our study 42.54% of patients were male and 57.46% of patients were female suffered with endocrinological disorders. **(Table 1).**

Age group distributions between 20-80 years of age were observed for this particular study. Age distribution wise 16.57% of patients in the age group of 20-30 years, 19.34% of patients in the age group of 31-40 years, 18.78% of patients in the age group of 41-50 years, 21.55% of patients in the age group of 51-60 years, 23.76% of patients in the age group of above 60 years, where the late adulthood above 60 years are greater in the percentage. **(Table 2).**

Epidemiology analyses on endocrinological disorders were 39.78% of patients with Diabetes Mellitus, 27.62% of patients with Thyroid Disorders, 32.60% of patients with Hormonal Imbalance. **(Table 3).**

Epidemiology analysis on combination of endocrinological disorders were 64.18% of Diabetic patients along with Thyroid Disorder, 22.39% of Diabetic patients along with Hormonal Imbalance, 13.49% of patients have Thyroid disorders along with Hormonal Imbalance. **(Table 4).**

Among 181 patients, 50 patients were affected by Thyroid disorders. In that 21 patients were treated with Thyroxine Sodium of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of drug. The patient benefit was Rs.45 by the use of Brand-B. In that 29 patients were treated with Levothyroxine of two different brands (Brand-A and Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.151.2 by the use of Brand-A. **(Table 5).**

Among 181 patients, 72 patients were affected by Hormonal imbalance. In that 28 patients were treated with Norethisterone of two different brands (Brand-A and Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.289.8 by the use of Brand-A. In that 44 patients were treated with Levonorgestrel + Ethinylestradiol of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patients benefit was Rs.273.4 by the use of Brand-B. **(Table 6).**

Among 181 patients, 59 patients were affected by Diabetes Mellitus. In that 13 patients were treated with Metformin of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.112.3 by the use of Brand-B. In that 11 patients were treated with Metformin and Glimpiride of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.1, 188 by the use of Brand-B. In that 9 patients were treated with Glimpiride of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.385.2 by the use of Brand-A. In that 8 patients were treated with Metformin + Glimpiride + Voglibose of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit Rs.941.4 by the use of Brand-A. In that 12 patients

were treated with Pioglitazone + Metformin of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.1, 902.96 by the use of Brand-B. In that 6 patients were treated with Soluble Insulin 50% + Insulin Isophane 50% of two different brands (Brand-A & Brand-B) was prescribed by the physician and analyze the cost utility of the drug. The patient benefit was Rs.7, 747.2 by the use of Brand-B. (**Table 7**).

CONCLUSION

The pharmacoepidemiology study was concluded that major population was affected by Diabetes Mellitus compared to Hormonal Imbalance & Thyroid Disorders in Endocrinological Disorders. In our study, Levothyroxine & Thyroxine Sodium were used for Thyroid disorder management in that Levothyroxine has a cost benefit when compared to Thyroxine Sodium. Norethisterone & Levonorgestrel + Ethinylestradiol were used for the management of Hormonal Imbalance in that Norethisterone has a cost benefit when compared to Levonorgestrel + Ethinylestradiol. In monotherapy of Diabetes Mellitus Glimepiride and Metformin were used in that Metformin molecule has a cost benefit when compared to Glimepiride. In combination therapy of Diabetes Mellitus Pioglitazone + Metformin has cost benefit when compared to Metformin + Glimepiride, Metformin + Glimepiride + Voglibose and Soluble Insulin 50% + Insulin Isophane 50%.

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