



Fluoxetine vs Venlafaxine: Economic Evaluation in Post Stroke Depression

¹Parvathy J, ¹Tania Mariam Philip, ¹Abhijith K, ¹Sreeni S, ¹Naveen Kumar Panicker*, ²Dr. Vivek Nambiar

¹Department of Pharmacy Practice, Amrita School of Pharmacy, Kochi, Amrita Vishwa Vidyapeetham, Amrita University, India.

²Department of Stroke Medicine, AIMS Healthcare Campus, Kochi.

*Corresponding author's E-mail: naveenkumarpanicker@aims.amrita.edu

Accepted on: 10-08-2016; Finalized on: 31-10-2016.

ABSTRACT

The primary aim of this study is to compare the antidepressants Venlafaxine and Fluoxetine in terms of their Cost-effectiveness. A prospective, comparative follow-up study was conducted in stroke unit. Sixty randomly selected stroke patients diagnosed with PSD and who met the inclusion criteria were classified into two subgroups with 30 patients each treated with antidepressants fluoxetine and venlafaxine. The HDRS17 was used to assess the effectiveness of the drugs by taking a baseline value at the time of initiation of therapy and followed up regularly at time intervals of 2, 4 and 8 weeks. The economic profiles of both drugs were determined by using cost-effectiveness analysis (ICER and ACER). The efficacy of the drugs was determined using the HDRS17, which showed an improvement in the score from baseline to 8 weeks. While performing cost-effectiveness analysis by comparing the cost and effect of fluoxetine against venlafaxine, incremental cost was positive (19.98) and the incremental effect was negative (-6). While performing the ACER for each drug the value obtained for fluoxetine was 6.02 and 4.96 for venlafaxine. The results of ICER and ACER show that venlafaxine is the cost-effective drug. Economic analysis shows that venlafaxine is the cost-effective drug among venlafaxine and fluoxetine.

Keywords: Post stroke depression, Hamilton depression rating scale, Incremental cost effectiveness ratio, Average cost effectiveness ratio, Selective serotonin reuptake inhibitors.

INTRODUCTION

Depression following a stroke is known as post stroke depression. It has long been recognized as one of the most common complication of stroke¹. The risk of occurrence of PSD is similar for the early, medium and late stroke recovery.

About one third of the stroke survivors are affected by emotions like frustration, fear, feeling of anger, sadness, anxiety and hopelessness. According to the National Institutes of Health, post-stroke depression is underdiagnosed².

Patient related factors associated with PSD are age, sex, coping abilities, enhanced disability and poor rehabilitation outcomes, personality, quality of life, extended use of health care, suicidal ideation, high rate of mortality and social support provided.

Hamilton Depression Rating Scale

The scale was developed in 1960 to assess the severity of depression in an inpatient population. In the original version of the scale used by clinicians it contained 17 items (HDRS 17) pertaining to symptoms of depression experienced over the past week. Later a 21 item version (HDRS 21) included 4 more items intended to subtype the depression. A limitation of HDRS is that atypical symptoms of depression (eg: hypersomnia, hyperphagia) are not assessed³.

Economic Evaluation

Cost-effectiveness analysis is the type of economic evaluation used in the study. Briefly, Economic evaluation is the analysis of alternative courses of action by comparison in terms of both their costs and consequence.

Cost Effectiveness Analysis (CEA)

It is used to compare the cost and consequences (outcome) of two or more treatment alternatives in achieving particular therapeutic objective. In a cost-effectiveness analysis, the consequences are measured in monetary units, such as life-years saved, percentage reduction in lipid levels, cases cured etc. Results from different cost-effectiveness analysis can be combined as long as the alternatives are specified with the same outcome measures.

Steps involved in designing and conducting a cost-effectiveness analysis:

- Define the problem
- Identify relevant treatment alternatives
- Describe the relationship between resource inputs and outcomes
- Identify cost and outcomes of treatment alternatives
- Valuing resource cost and outcomes
- Interpretation and presentation of results



The results of the CEA can be expressed as Average cost-effectiveness ratio (ACER) or Incremental cost-effectiveness ratio (ICER). It can be also expressed as Cost consequence analysis (CCA).

The results of CEA can be illustrated as:

- cost-effectiveness plane
- cost-effectiveness grid

A **cost-effectiveness grid** is used to compare a new drug with current standard treatment to determine a therapy/service is cost effective.

Multiple strategies can be evaluated and informed decisions can be made using **cost-effectiveness plane (CE plane)**⁴.

Objective

The primary aim of this study is to compare the antidepressants Venlafaxine and Fluoxetine in terms of their Cost-effectiveness.

Background

Post stroke depression has long been recognized as one of the most common sequelae of stroke if left untreated and can affect the recovery and quality of life. In our study centre, Fluoxetine and Venlafaxine are commonly used in the management of PSD. Studies related to the pharmacoeconomics of these two drugs are limited. In this scenario, we aim to perceive the safety and efficacy of these drugs in context of economic implications. Even though controversies regarding the efficacy of these drugs still exist, meta-analysis consistently suggests that Venlafaxine may have greater efficacy than SSRI as a class.

METHODOLOGY

Non-experimental, comparative, prospective follow-up study was carried out in patients admitted in the department of Stroke Medicine of Amrita Institute of Medical Sciences (AIMS) Kochi, from October 2014 to June 2015. All the patients admitted in the department of stroke medicine were screened for depression using HDRS and from among them, 30 patients each in both the groups who satisfy the inclusion criteria were taken for the study. First group was treated with fluoxetine and the second with venlafaxine. A specific data collection form was used for obtaining required information. The data were collected from the medical records of the admitted patients as well as by direct interview with Health care providers and the patients or his/her care givers. The selected patients were analyzed continuously for the therapeutic outcome.

The efficacy of both the drugs was analyzed using HDRS. Baseline values of HDRS were taken at the time of diagnosis and the follow-up was done after 2, 4 and 8 weeks respectively. The economic profiles of the drugs were also considered by cost-effectiveness analysis. The

data thus obtained were compared for the economic profiles of both the drugs.

The difference in the HDRS from baseline to score obtained after 8 weeks were calculated for both fluoxetine and venlafaxine. The averages of both were taken. The total cost of pharmacotherapy for each patient was calculated for two months and its average was also taken.

For calculation of cost-effectiveness, ICER was used, which is the ratio of the difference in total cost to the difference in outcome.

$$\text{ICER} = (\text{C}_{\text{option 2}} - \text{C}_{\text{option 1}}) / (\text{Effectiveness}_{\text{option 2}} - \text{Effectiveness}_{\text{option 1}})$$

ACER was also calculated, which is the ratio of health care cost to the clinical outcome, to identify which drug is more effective.

$$\text{ACER} = \text{Health care cost (in dollars)} / \text{Clinical outcome (not in dollars)}$$

Drug with least value will be considered as effective.

The tabulated and analyzed data were compared with the data from other study. The data collected were compiled using Microsoft Excel. Other simple mathematical calculations like percentage were also used in the study.

RESULTS

While performing ICER, by comparing the cost and effect of fluoxetine against venlafaxine, incremental cost was positive (19.98) and the incremental effect was negative (-6). So the treatment with fluoxetine is not cost-effective because of achieving poorer outcomes at higher cost.

While performing the ACER for each drug, the value obtained for fluoxetine was 6.02 and 4.96 for venlafaxine. Drug with least value is considered to be effective, so in this case venlafaxine is effective.

Table 1: Cost-effectiveness analysis

	Cost	Effectiveness	ACER
Venlafaxine	Rs.262.4	52.9	4.96
Fluoxetine	Rs.282.38	46.9	6.02
ICER	19.98	-6	ICER = -3.33 ACER = 1.06

DISCUSSION

Pharmacoeconomic studies comparing the drugs Fluoxetine and Venlafaxine are limited. Our study was conducted in 30 patients each consuming Fluoxetine and Venlafaxine. The costs of their treatment for 8 weeks were compared and the cost effectiveness was identified using ICER and ACER. The results pointed that Venlafaxine is more cost effective when compared to Fluoxetine.

CONCLUSION

Depression following a stroke is known as Post Stroke Depression or PSD. Early detection and treatment of PSD,



which is an under-diagnosed condition, is required for the faster recovery of the patient. Our study results show that Venlafaxine is more cost effective than Fluoxetine for the treatment of PSD. Accounting the results obtained in our study it may be concluded that venlafaxine is the better option for the treatment of PSD.

REFERENCES

- 1) Iris Zavoreo, Vanja Basic-Kes, Marijana Bosnar-Puretic, Vida Demarin. Post-stroke depression. Acta Clin Croat. 48, 2009, 329-333.
- 2) Stroke.org (internet) Stroke Recovery: We can help survivors; 2014 July1 [cited 2014 Sept 10] at <http://www.stroke.org/we-can-help/survivors/stroke-recovery>
- 3) Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry, 23, 1960, 56-62.
- 4) Michael F.D, Mark J.S, George W.T, Bernie J.O, Greg L.S. Methods for the Economic Evaluation of Health Care Programmes, 3rd ed. New York: Oxford University Press, 7-17, 2005, 103-133.

Source of Support: Nil, **Conflict of Interest:** None.

