Original Article ISSN (O):2395-2822; ISSN (P):2395-2814

Selective Serotonin Reuptake Inhibitor (SSRI) Efficiency, and Comparison to Alternative Antidepressant Treatments.

Angela Camilli[1], Mir Saleem[2]
[1]NOVA Southeastern University, Halmos College of Natural Sciences and Oceanography.

Received: January 2018
Accepted: January 2018

ABSTRACT

Background: Depression is one of the most important causes of disability-adjusted life years. Currently, the majority of patients are treated with SSRIs. However, the effectiveness of SSRIs is questionable. **Method:** The purpose of this study was to determine the effectiveness of the pharmacotherapy treatment selective serotonin reuptake inhibitors (SSRIs) in patients diagnosed with major depression. This was achieved by comparison to other methods of antidepressant treatment such as, selective serotonin norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), electroconvulsive therapy (ECT), and psychotherapy. **Results:** The majority of patients were taking SSRIs for treatment of depression alone or in combination with other antidepressant medications. More than half those patients showed pharmacological effectiveness. However, patients who were taking other types of antidepressants also experienced reduction in their symptoms. **Conclusion:** The analysis of data that was collected from an outpatient mental health private practice, showed no advantage in effectiveness of SSRIs compared with other treatment options.

Keywords: Selective serotonin reuptake inhibitors, SSRI, antidepressant, treatment of depression, selective serotonin norepinephrine reuptake inhibitors, SNRI, tricyclic antidepressants, TCA.

INTRODUCTION

Depression is classified as a disability that impacts the daily life of a large number of peo-ple world-wide. Specifically, "depression is the second leading cause of life years spent with dis-ability, and the third leading cause of disability-adjusted life years".[1] Between 1990 and 1998 there was a 147.5% increase in the number of patients diagnosed with depression.[2] Data from another study showed that between 2009-2012 at least 5% of Americans 12 years of age and older had depression.[3]

The anatomy and physiology behind depression is known to be an imbalance of emotional homeostasis in the limbic system, specifically between the prefrontal cortex, cingulate cortex, and amygdala4. The imbalance has to do mainly with serotonin, a neurotransmitter that plays a role in "the control of sleep and wakefulness, feeding, termoregulation, cardiovascular function, eme-sis, sexual behavior, spinal regulation of motor function, emotional and psychotic behavior, and drug-induced hallucinatory states".[5] Depression presents unusually low concentration levels of serotonin in the extracellular synapses of the brain. Although it is impossible to measure the actu-al level of serotonin in a living human due to the invasiveness of the procedure, neuroimaging techniques have been used to visualize major differences before and after treatments of interest6. To counteract this imbalance, antidepressant medications have been engineered to bind to one or more of the following monoamine transporter proteins: The serotonin transporter (SERT), the noradrenaline transporter (NAT), and the dopamine transporter (DAT).[1] By the monoamine transporters binding to the medication, there is a conformational change to inhibit the binding of the neurotransmitters.[1] The antidepressant medications are grouped into categories based on which monoamine transporter proteins they bind, such as: Tricyclic antidepressants and related compounds, dopamine-reuptake blocking compounds, 5-HT2 receptor antagonist properties, 5-HT3 receptor antagonist properties, noradrenergic antagonist, monoamine oxidase inhibitors, sero-tonin/norepinephrine reuptake inhibitors (SNRIs) and selective serotonin reuptake inhibitors (SSRIs).[7] Due to the high risk of side effects and lack of effectiveness or remission however, many patients are reluctant to take majority of

Name & Address of Corresponding Author
Mir Saleem, MD, MS
3rd Floor, Parker Building, Dept. of Biology
3301 College Avenue
Halmos College of Natural Sciences and Oceanography
NOVA Southeastern University
Fort Lauderdale, FL 33314
USA.

antidepressant medications and a total of 72% of patients discontinue taking the medications by the end of 3 months from first date prescribed.[8.,9]

This study was carried out because depression is a serious public health concern world-wide.[10] The number of individuals receiving antidepressant pharmacologic treatments has in-creased. Yet, recently there has been found a statistically significant decrease in the rate of effec-tive treatments.[11] Today, the leading method of antidepressant treatment is the selective seroto-nin reuptake inhibitors (SSRIs).[12] The purpose of this study was to determine the effectiveness of SSRIs compared with other antidepressant medications. In this study, we hypothesized that SSRIs do not have significance over the effectiveness of other methods of antidepressant treat-ments.

MATERIALS AND METHODS

Fifty patients' charts from an outpatient mental health private practice were randomly se-lected. The data from those charts were collected and analyzed. Since the files come from an outpatient mental health private practice, the patients were taking combination therapy of phar-macotherapy and psychotherapy. The determination of treatment effectiveness was based upon the reduction of symptoms and fewer side effects.

RESULTS

Thirty-four patients were female (68%) and the rest were male (32%). The age of patients ranged from 20 to 81 years. As expected, the most common antidepressant prescribed was SSRIs. Of the 50 patient files analyzed, a total of 88% individuals were medicating with one or more SSRIs, 16% were prescribed one or more SNRIs, 10% were prescribed one or more TCAs, and 40% were prescribed one or more of unrelated antidepressants. Such unrelated antidepres-sants are of the following: 5HTP, Trazodone, Wellbutrin XL, Wellbutrin XR, Remeron, Brintel-lix, and St. Johns Wort. Along with the antidepressant drugs being prescribed, other medications were listed for each patient. Medications prescribed to treat anxiety are of the following: Vistaril, Xanax, Klonopin, Buspirone, and Ativan. Medications prescribed that work as a central nervous system stimulant were: Ritalin, Concerta, Adderall XR, Provigil, Focalin, and Focalin XR. Antipsychotic drugs prescribed to the patients were: Abilify, Risperidone, and Seroquel.

A total of 31 patients experienced pharmacologic effectiveness against depression with no side effects. Of the 50 total patients, 11 were prescribed one SSRI, and 8 of the 11 showed progress. Of the 50 total patients, 33 were prescribed a combination of antidepressants that in-cluded at least one SSRI, and 20 showed progress.

Four patients were prescribed a single SNRI and another 4 patients were prescribed a combination of antidepressants including at least 1 SNRI. Of the 8 patients prescribed one or more SNRI, a total of 5 showed progress. Three of the 5 patients were prescribed one SNRI as the antidepressant, 1 patient took an SNRI in combination with Trazodone (antidepressant), and 1 patient was on SNRI in combination with Lexapro (SSRI).

Of the 5 patients prescribed one or more TCA, 4 showed progress. All 5 were taking a TCA in combination with other antidepressants, and no SNRIs or SSRIs.

Of the 20 patients prescribed alternative antidepressant drugs, 14 showed progress. Nine-teen of the patients were taking at least one antidepressant in combination with other antidepres-sants (including SSRIs and SNRIs), 1 of the patients was taking an unrelated antidepressant alone. Of the 14 patients that showed progress: 1 was taking the drug alone, 12 were taking the drug with a combination of other antidepressants, and 1 was taking the drug in combination with an SNRI.

DISCUSSION

The objective of this study was to determine the overall effectiveness of selective seroto-nin reuptake inhibitors in comparison to other methods of treatment for depression. Of all of the patients who were prescribed one SSRI or a combination containing at least one SSRI, 64% showed effectiveness. When analyzing the 64% of patient files, 88% of the files included pa-tients who were prescribed at least one SSRI. Of those 88%, 29% of patients were prescribed a single SSRI and 71% of patients were taking a combination including at least one SSRI.

Of all of the patients who were prescribed one SNRI or a combination containing at least one SSRI, 63% showed effectiveness. Of those 63%, 36% of the patients were prescribed a single SNRI, and 27% of them were prescribed a combination containing at least one SNRI. When comparing patients who were taking SSRIs and SNRIs, the percentages of those who saw pro-gress are 64% and 63%, respectively.

Patients who were taking TCA, 80% showed progress, and all of those patients were tak-ing a combination of antidepressants including at least one TCA. In comparing SSRIs and TCAs, the percentages of those who saw progress are 64% and 80%, respectively.

Seventy percent of patients prescribed antidepressants of unrelated classifications showed pro-gress. Five percent of the 70% were prescribed a single antidepressant and the remaining 65% of patients were prescribed a combination of antidepressants, at least one from an unrelated classifi-cation. In comparing SSRIs and unrelated antidepressant classifications, the percentages of

those who saw progress are 64% and 70%, respectively.

T-tests were completed in the comparison of SSRIs and SNRIs, SSRIs and TCAs, and SSRIs and unrelated antidepressant classifications. The T-tests were two-tailed and the signifi-cance level was set at 0.05.

- SSRI vs SNRI: Z-score = 0.0614, p-value = 0.95216
- SSRI vs TCA: Z-score = - 0.7284, p-value = 0.4654
- SSRI vs unrelated antidepressants: Z-score = -0.4968, p-value = 0.61708

All T-tests resulted in no statistical significance. However, 88% of the total patient files observed were prescribed one or more SSRI. Therefore, when analyzing data there are limitations on the conclusion of statistical significance of effectiveness as there are not as many patients with the remaining classifications of antidepressants. To eliminate the limitation, an additional T-test was calculated in the comparison of SSRIs and all other pharmacologic methods of treatment observed. The test was two-tailed and the significance level was set at 0.05. The z-score was -0.5565 and the p-value was 0.57548. Again, the results yielded no statistical significance. There-fore, SSRIs are not significantly more effective than other methods of treatment. The details of the calculations for different groups are written below:

CONCLUSION

The objective of this study was to determine the overall rate of effectiveness of SSRIs in comparison to other pharmacologic methods of antidepressant treatments. The alternative treat-ments were SNRIs, TCAs, and a variety of antidepressants that did not fall into the related clas-sifications. Overall the study showed that SSRIs do not show a higher effectivity than other methods of antidepressant treatment. Although the overall rate of effectiveness is 72%, the rate could be significantly higher if SSRIs were not the first choice of treatment. However, the data for this study was drawn from an outpatient clinic with mostly Caucasian ethnicity. Further stud-ies with larger sample size, and patients with different ethnic background is needed.

REFERENCES

1. Fiest KM, Jette N, Quan H, St. Germaine-Smith C, Metcalfe A, Patten SB, et al. Systematic review and assessment of validated case definitions for depression in administrative data. BMC Psychiatry 2014;14:289.
2. Serretti A, Kato M. The serotonin transporter gene and effectiveness of SSRIs. Expert Review of Neurotherapeutics 2008 01;8(1):111-20.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 5th ed., (DSM-5). Washington, DC: American Psychiatric Publishing; 2013.
4. Bennett MR. Synapse regression in depression: The role of 5-HT receptors in modulating NMDA receptor function and synaptic plasticity. Aust N Z J Psychiatry 2010;44(4):301-308.
5. Casacchia M, Pollice R, Matteucci M, Roncone R. Brain serotonin and the mechanism of action of selective serotonin re-uptake inhibitors (SSRI). Arch Gerontol Geriatr 1998;Suppl 6:65-70.
6. Andrews PW, Bharwani A, Lee KR, Fox M, Thomson JA. Is serotonin an upper or a downer? The evolution of the serotonergic system and its role in depression and the antidepressant response. Neurosci Biobehav Rev 2015 04;51:164-188.
7. Antidepressant Agents. In: Lexi-drugs online [database on the Internet]. Hudson (OH): Lexicomp, Inc.; 2016 [updated 29 Sept 2016; cited 20 Mar 2017]. Available from: http://online.lexi.com. Subscription required to view.
8. Mutalik, Shruti. "A Short History of the SSRI". Psychiatric Times 2014. Web. 20 Mar. 2017.
9. Masand PS. Tolerability and adherence issues in antidepressant therapy. Clin Ther 2003 08;25(8):2289-2304.
10. Baik S, Crabtree BF, Gonzales JJ. Primary care clinicians' recognition and management of depression: A model of depression care in real-world primary care practice. Journal of General Internal Medicine 2013 11;28(11):1430-1439.
11. Harman JS, PhD., Edlund, Mark J,M.D., PhD., Fortney JC, PhD. Trends in Antidepressant Utilization From 2001 to 2004. Psychiatric Services 2009 05;60(5):611-6.
12. Fox MA, Jensen CL, French HT, Stein AR, Huang S, Tolliver TJ, et al. Neurochemical, behavioral, and physiological effects of pharmacologically enhanced serotonin levels in serotonin transporter (SERT)-deficient mice. Psychopharmacology (Berl) 2008 12;201(2):203-18.

How to cite this article: Camilli A, Saleem M. Selective Serotonin Reuptake Inhibitor (SSRI) Efficiency, and Comparison to Alternative Antidepressant Treatments. Ann. Int. Med. Den. Res. 2018; 4(2):SG04-SG06.

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