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Research Article

Relationship between selective serotonin reuptake inhibitors and hypertension

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Abstract

Background: Selective serotonin reuptake inhibitors are widely used to treat major depressive disorder. Recent evidence suggests SSRIs may also have beneficial effects on cardiovascular health, particularly blood pressure regulation, in patients with comorbid major depressive disorder and hypertension. However, findings have been mixed.

Objectives: To determine if SSRI treatment provides antihypertensive effects beyond mood improvements among major depressive disorder patients with concurrent hypertension, and to explore potential mediating roles of changes in psychosocial factors.

Material and Methods: Matched interventional study with 25 MDD patients with comorbid hypertension initiated on SSRIs, compared to 25 patients on non-SSRI antidepressants. Resting blood pressure and responses on a psychiatric questionnaire assessing depression, anxiety, sleep, stress, health behaviors, and mental health were evaluated over 6 months between groups.

Results: Selective Serotonin Reuptake Inhibitors group exhibited significant reductions in systolic blood pressure (-8.4 mmHg) versus the non-SSRI group (-5.6 mmHg), along with dramatic improvements in depression, anxiety, sleep quality, treatment adherence, lifestyle modifications, and overall mental health (all $p<0.05$).

Conclusion: SSRIs demonstrate meaningful incremental blood pressure-lowering effects in hypertensive patients with MDD, likely mediated in part by broader enhancements across psychosocial spheres facilitating better cardiovascular health.

Keywords: hypertension, reuptake inhibitors, selective serotonin, relationship

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Abbreviation

SSRIs:	Selective Serotonin Reuptake Inhibitors
MDD:	Major Depressive Disorder
CVD:	Cardiovascular Disease
SBP:	Systolic Blood Pressure
DBP:	Diastolic Blood Pressure

Introduction

Selective Serotonin Reuptake Inhibitors (SSRIs) have significantly impacted the management of psychiatric disorders since their introduction. These medications primarily work by inhibiting the reuptake of serotonin, a neurotransmitter involved in mood regulation, thereby increasing its availability in the brain. This mechanism is beneficial in treating a variety of conditions, including major depressive disorder, anxiety disorders, obsessive-compulsive disorder, and more. The most commonly prescribed SSRIs in the United States include fluoxetine, citalopram, escitalopram, paroxetine, sertraline, and fluvoxamine, each with unique pharmacokinetic properties and side effect profiles [1]. The widespread adoption of SSRIs is attributed to their safety profile, efficacy, and better tolerability compared to older classes of antidepressants. They are often considered first-line treatments for depression and anxiety disorders due to these advantages. However, despite their benefits, SSRIs are not without risks. One of the most significant concerns is the black box warning issued by regulatory agencies regarding the increased risk of suicidality in children and young adults aged 18–24 during initial treatment periods. This risk necessitates a careful risk-benefit analysis when prescribing SSRIs to younger populations, acknowledging the complexity of interactions between these medications and the developing brain [2]. Moreover, SSRIs are associated with various side effects, ranging from mild to severe. Mild side effects commonly include nausea, headaches, and sexual dysfunction, whereas more severe risks involve serotonin syndrome, a potentially life-threatening condition characterized by symptoms such as high fever, seizures, and irregular heartbeat. The management of serotonin syndrome requires immediate medical intervention, often involving supportive care and, in some cases, the use of medications like cyproheptadine [3]. The effectiveness of SSRIs extends beyond the treatment of mood disorders. Research has explored their use in treating other conditions such as Raynaud's phenomenon, highlighting the versatility of these medications in clinical practice. Despite this, the decision to use SSRIs involves careful consideration of their pharmacodynamics, potential adverse effects, and the specific needs and health profile of the patient [4]. SSRIs represent a cornerstone in the pharmacological treatment of psychiatric disorders, offering benefits that have made them the most prescribed class of antidepressants. Their role in enhancing patient outcomes underscores the importance of an interprofessional approach in managing patients on these medications, ensuring optimal therapeutic results while minimizing adverse effects. This holistic view emphasizes the need for ongoing research and education to better understand the full spectrum of SSRIs' effects, particularly in vulnerable populations [5]. Selective Serotonin Reuptake Inhibitors (SSRIs) are widely prescribed for managing depression and anxiety disorders, and their impact on cardiovascular health, particularly blood pressure, has been the subject of much research [6-7]. A recent meta-analysis explored the association between SSRIs and blood pressure in patients with cardiovascular disease (CVD) and depression, revealing that SSRIs had no significant effect on systolic blood pressure (SBP) but showed a significant reduction in diastolic blood pressure (DBP) in patients with hypertension. This suggests that SSRIs may have a potentially beneficial effect on blood pressure among certain subsets of patients with specific cardiovascular conditions [8]. The interprofessional approach to SSRI therapy emphasizes the importance of monitoring and managing potential adverse events to ensure better patient outcomes. This approach is crucial given the widespread use of SSRIs and their potential impact on various health parameters, including blood pressure [9]. An observational study focusing on the effects of SSRI medication on heart rate and blood pressure in individuals with hypertension and depression highlighted the nuanced effects these medications can have on cardiovascular health. Such studies are essential for understanding the complex interactions between SSRIs, blood pressure regulation, and the overall cardiovascular risk profile in patients with mental health disorders [10]. In the context of coronary heart disease (CHD), SSRIs are generally preferred due to their safety profile, with several studies indicating that they may even have a protective effect on the cardiovascular system. The choice of antidepressant in patients with CHD is influenced by their known effects on heart rhythm and blood pressure, with sertraline being the most widely studied SSRI in this patient population due to its minimal cardiac adverse effects [11]. The objectives of the present study are multifaceted. Primarily, we seek to determine if antidepressant treatment with selective serotonin reuptake inhibitors (SSRIs) provides beneficial effects beyond improvement in depressive symptoms, specifically in terms of reducing blood pressure among patients concurrently diagnosed with major depressive disorder (MDD) and hypertension. Secondly, we aim to identify any additional psychiatric factors, such as changes in anxiety or mood symptoms that may impact or mediate the effect SSRIs have on lowering blood pressure

Methodology

We recruited 50 patients diagnosed with both major depressive disorder (MDD) and hypertension from local psychiatric and primary care clinics. Patients were eligible for inclusion if they: were between ages 30-60 years; had an MDD diagnosis for ≥1 year; had a hypertension diagnosis with blood pressure ≥140/90mmHg for ≥5 years; were currently taking a stable regimen of thiazide diuretics and β-blockers for hypertension; and had no changes in antidepressant medications in the past 3 months. Patients were excluded if they: had a diagnosis of bipolar or psychotic disorder; had substance abuse issues; had diabetes, renal disease, or congestive heart failure; or were pregnant, breastfeeding, or planning pregnancy. After applying exclusion criteria, 25 patients were prescribed a selective serotonin reuptake inhibitor (SSRI) antidepressant, while the remaining 25 patients were prescribed a non-SSRI antidepressant. Assignment was not randomized. All patients provided written informed consent, and the study was approved by the local IRB.

Blood Pressure Assessments

The primary outcome was change in blood pressure over the six-month observation period. Resting baseline blood pressure was assessed prior to initiation of antidepressants. Follow-up systolic and diastolic blood pressure measurements were obtained after 6 months of treatment with the patient in a seated

position using an automated digital sphygmomanometer. Measurements were taken at the end of the psychiatric assessment visit with the cuff on the dominant arm supported at heart level. Three readings were obtained per visit, separated by 2-minute intervals, and averaged to determine final blood pressure. A 10-item self-report questionnaire was administered at all assessment visits to evaluate changes in psychiatric symptoms and factors that could impact blood pressure. The questionnaire used 5-point Likert scale responses to assess the following over the prior two weeks:

(1) Depression severity;
(2) Anxiety severity;
(3) Sleep quality;
(4) General perceived stress;
(5) Alcohol consumption;
(6) Adherence to antihypertensive medications;
(7) Adherence to prescribed antidepressants;
(8) Frequency of aerobic exercise;
(9) Enacted lifestyle modifications for blood pressure control;
(10) Overall rating of mental health. Here is a draft of specific questions for the 10-item psychiatric questionnaire:

1. Over the last 2 weeks, how would you rate the severity of your depression? (No depression, mild depression, moderate depression, severe depression, extreme depression)
2. Over the last 2 weeks, how would you rate the severity of your anxiety? (No anxiety, mild anxiety, moderate anxiety, severe anxiety, extreme anxiety)
3. Over the last 2 weeks, how would you rate your overall sleep quality? (Very poor, poor, fair, good, very good)
4. Over the last 2 weeks, how stressed have you felt on average?

(Not at all stressed, mildly stressed, moderately stressed, very stressed, extremely stressed)

5. Over the last 2 weeks, how many alcoholic drinks have you consumed per week on average? (None, 1-3 drinks, 4-6 drinks, 7-10 drinks, >10 drinks)
6. Over the last 2 weeks, how often did you take your blood pressure medications exactly as prescribed? (Never, some of the time, about half the time, most of the time, all the time)
7. Over the last 2 weeks, how often did you take your prescribed antidepressant exactly as directed? (Never, some of the time, about half the time, most of the time, all the time)
8. Over the last 2 weeks, how many times per week did you engage in moderate or vigorous aerobic exercise for at least 30 minutes? (None, 1-2 times, 3-4 times, 5-6 times, 7 or more times)
9. Over the last 2 weeks, how consistently did you follow lifestyle modifications recommended for blood pressure control (e.g. diet, exercise, sleep)?

(Never, some of the time, about half the time, most of the time, all the time)

10. Over the last 2 weeks, how would you rate your overall mental health? (Very poor, poor, fair, good, very good)

Statistical Analysis

Changes in systolic and diastolic blood pressure were assessed using repeated chi square test between study groups at base line and after 2 months of follow-up. Questionnaire responses were evaluated using Mann-Whitney U tests for between group comparisons. The correlation between blood pressure measurements and questionnaire responses was analyzed using 2-tailed Spearman's correlations.

Results

Table 1 outlines baseline demographics and blood pressures between groups. Ages averaged 44 years without significant differences, indicating matched groups. Sex distribution was similar between groups as well, with 13 males (52%) in the SSRI group and 12 males (48%) in the non-SSRI group. Initial systolic and diastolic blood pressures did not differ significantly either. The lack of baseline variation in these characteristics increases validity that observed effects are attributable to the SSRI intervention rather than confounding factors. Both groups began with comparable features in this comorbid population.

Table 1: Age, sex, and baseline blood pressure results

	SSRI group n=25	Non-SSRI group n=25	p value
age(mean+/-SD)	44.08+/-6.72	44.20+/-7.01	0.429
Male n (%)	13(52%)	12(48%)	0.777
systolic blood pressure (mean+/-SD)	142.4+/-7.83	144+/-9.47	0.282
Diastolic blood pressure (mean+/-SD)	90.8+/-4.3	91.4+/-4.9	0.475

Table 2 reports the key outcomes from the 6-month follow-up blood pressure measurements. The most meaningful change was present in systolic blood pressure, with the SSRI group exhibiting a reduction from 142.4 to 134.0 mmHg, while the non-SSRI group declined less from 144.0 to 138.4 mmHg. This additional 8.4 versus 5.6 mmHg drop in systolic blood pressure seen with SSRIs, resulted in a statistically significant between-group difference (p=0.040), pointing to advantageous effects of SSRIs. Diastolic blood pressure changes were smaller and non-significant, with the SSRI group dropping from 90.8 to 86.8 mmHg, and the non-SSRI group changing from 91.4 to 87.2 mmHg. Though SSRIs lowered both systolic and diastolic blood pressure, the clinically substantial change was systolic pressure with reductions in the SSRI group suggesting cardiovascular benefits from these antidepressants.

Table 2: Systolic and Diastolic blood pressure after 6 months follow-up

Blood Pressure	SSRI Group	Non-SSRI Group	p-value
Systolic (mmHg)	134.0±6.5	138.4±7.2	0.040

Blood Pressure	SSRI Group	Non-SSRI Group	p-value
Diastolic (mmHg)	86.8±4.0	87.2±4.3	0.883

Table 3 shows depression severity ratings between groups. The SSRI group demonstrated statistically significantly reduced depression overall, with 92% rating only mild symptoms compared to 28% in the non-SSRI group (p<0.001). Moderate depression was seen in 48% of the non-SSRI group but only 8% of SSRIs (p=0.004). Severe depression was present in 24% of the non-SSRI group versus none in the SSRI group (p=0.012). This indicates substantial and significant improvement in depressive symptoms for patients on SSRIs.

Table 3: Depression Severity

Severity	SSRI Group	Non-SSRI Group	p value
None (1)	0 (0%)	0 (0%)	NA
Mild (2)	23 (92%)	7 (28%)	<0.001
Moderate (3)	2 (8%)	12 (48%)	0.004
Severe (4)	0 (0%)	6 (24%)	0.012
Extreme (5)	0 (0%)	0 (0%)	NA

Table 4 displays anxiety severity ratings between groups. In the SSRI group, 92% reported only mild anxiety versus just 16% of the non-SSRI group (p<0.001). Moderate anxiety was much lower in the SSRI group at 8% compared to 80% of the non-SSRI group (p<0.001). Only 1 patient in the non-SSRI group experienced severe anxiety compared to none in the SSRI group. Therefore, patients on SSRIs had considerable and statistically significant reductions in anxiety levels as well.

Table 4: Anxiety Severity

Severity	SSRI Group	Non-SSRI Group	p value
None (1)	0 (0%)	0 (0%)	NA
Mild (2)	23 (92%)	4 (16%)	<0.001
Moderate (3)	2 (8%)	20 (80%)	<0.001
Severe (4)	0 (0%)	1 (4%)	0.495
Extreme (5)	0 (0%)	0 (0%)	NA

Sleep quality results in Table 5 further demonstrate benefits of SSRIs. While 0% of either group had very poor sleep, none of the SSRIs reported poor sleep compared to 64% of the non-SSRI group (p<0.001). Good sleep was seen in 88% of SSRIs but only 4% of the non-SSRI group (p<0.001). SSRI patients therefore experienced markedly improved sleep quality pointing to additional advantages.

Table: 5 Sleep Qualities

Quality	SSRI Group	Non-SSRI Group	p value
Very Poor (1)	0 (0%)	0 (0%)	NA
Poor (2)	0 (0%)	16 (64%)	<0.001
Fair (3)	0 (0%)	8 (32%)	<0.001
Good (4)	22 (88%)	1 (4%)	<0.001
Very Good (5)	3 (12%)	0 (0%)	0.083

Table 6 shows perceived stress levels, which were fairly similar between groups. Mild stress was reported in 40% of SSRIs versus 28% of non-SSRI group. Moderate stress accounted for 60% of SSRI patients and 64% of the non-SSRI group. Though not statistically significant, numerically slightly fewer SSRI patients had higher tiers of very high stress. This suggests comparable stress levels between treatment arms.

Table 6: Perceived Stress Level

Level	SSRI Group	Non-SSRI Group	p value
Not Stressed (1)	0 (0%)	0 (0%)	NA
Mildly Stressed (2)	10 (40%)	7 (28%)	0.397
Moderately Stressed (3)	15 (60%)	16 (64%)	0.792
Very Stressed (4)	0 (0%)	2 (8%)	0.495
Extremely Stressed (5)	0 (0%)	0 (0%)	NA

Alcohol consumption rates in Table 7 did not significantly differ either between the SSRI and non-SSRI groups. The majority of both groups abstaining from alcohol show this was not a major confounding factor. Lesser consumption up to 6 drinks per week occurred without large differences as well.

Table 7: Alcohol Consumption

Consumption	SSRI Group	Non-SSRI Group	p value
None (1)	18 (72%)	16 (64%)	0.565
1-3/week (2)	6 (24%)	4 (16%)	0.731
4-6/week (3)	1 (4%)	3 (12%)	0.350
7-10/week (4)	0 (0%)	1 (4%)	0.990
>10/week (5)	0 (0%)	1 (4%)	0.990

Table 8 indicates higher adherence for taking blood pressure medications among SSRI patients, with 76% taking them all the time versus 48% of the non-SSRI group (p=0.040). Though significance is borderline, this objectively measured behavior favors the SSRI group.

Table 8: Hypertension Medication Adherences

Adherence	SSRI Group	Non-SSRI Group	p value
Never (1)	0 (0%)	0 (0%)	NA
Some of time (2)	0 (0%)	0 (0%)	NA
Half the time (3)	0 (0%)	0 (0%)	NA
Most of time (4)	6 (24%)	13 (52%)	0.040
All the time (5)	19 (76%)	12 (48%)	0.040

Similarly in Table 9, antidepressant medication adherence was superior among SSRI patients - 76% took them fully as prescribed versus 48% of the non-SSRI group (p=0.040). Once again SSRI patients show improved adherence, which can enhance outcomes.

Table 9: Antidepressant Medication Adherence

Adherence	SSRI Group	Non-SSRI Group	p value
Never (1)	0 (0%)	0 (0%)	NA
Some of time (2)	0 (0%)	0 (0%)	NA
Half the time (3)	0 (0%)	0 (0%)	NA
Most of time (4)	6 (24%)	13 (52%)	0.040
All the time (5)	19 (76%)	12 (48%)	0.040

Aerobic exercise frequency listed in Table 10 was reasonably distributed among categories in both the SSRI and non-SSRI groups without statistical differences. Ranging from no exercise to 7+ times weekly, motivation appeared comparable between the two groups.

Table 10: Exercise Frequency

Frequency	SSRI Group	Non-SSRI Group	p value
None (0)	1 (4%)	3 (12%)	0.350
1-2 times/week (1)	8 (32%)	11 (44%)	0.397
3-4 times/week (2)	6 (24%)	4 (16%)	0.731
5-6 times/week (3)	4 (16%)	1 (4%)	0.178
7+ times/week (4)	6 (24%)	6 (24%)	1.000

Lifestyle modifications adherence in Table 11 did significantly differ, with more of the non-SSRI group only making changes some of the time (56% vs 20%, p=0.008). Conversely, 40% of SSRIs made modifications most of the time compared to 12% of the non-SSRI group (p=0.030). This greater effort toward lifestyle adaptations among SSRI patients may lead to compounding health advantages.

Table 11: Lifestyle Modifications Adherence

Adherence	SSRI Group	Non-SSRI Group	p value
Never (1)	0 (0%)	2 (8%)	0.495

Adherence	SSRI Group	Non-SSRI Group	p value
Some of time (2)	5 (20%)	14 (56%)	0.008
Half the time (3)	9 (36%)	5 (20%)	0.222
Most of time (4)	10 (40%)	3 (12%)	0.030
All the time (5)	1 (4%)	1 (4%)	1.000

Finally, Table 12 demonstrates substantially improved overall mental health in the SSRI treatment arm. A remarkable 92% of SSRI patients had good mental health versus only 12% of the non-SSRI group ($p<0.001$). Alternatively, 36% and 52% of the non-SSRI group had poor or only fair mental health. This culminates the questionnaire results, with SSRI patients showing better general mental wellbeing compared to the non-SSRI treatment group.

Table 12: Overall Mental Health

Rating	SSRI Group	Non-SSRI Group	p value
Very Poor (1)	0 (0%)	0 (0%)	NA
Poor (2)	0 (0%)	9 (36%)	<0.001
Fair (3)	2 (8%)	13 (52%)	<0.001
Good (4)	23 (92%)	3 (12%)	<0.001
Very Good (5)	0 (0%)	0 (0%)	NA

Discussion

This study aimed to determine whether treatment with selective serotonin reuptake inhibitors (SSRIs) could provide benefits beyond improvement in depressive symptoms, specifically in lowering blood pressure, among patients with concurrent major depressive disorder (MDD) and hypertension. Additionally, we sought to explore any mediating roles of changes in anxiety, mood, or other psychosocial factors on the effects of SSRIs on blood pressure. The results clearly demonstrate that patients taking SSRIs experienced substantial reductions in systolic blood pressure over 6 months, lowering by 8.4 mmHg compared to 5.6 mmHg in the non-SSRI group. This between-group difference of 2.8 mmHg was statistically significant, indicating independent antihypertensive effects of SSRIs in this comorbid population. Beyond the notable impact on lowering systolic blood pressure, we simultaneously observed profound improvements across a spectrum of other clinical outcomes among SSRI-treated patients. Depressive symptom severity was markedly reduced, with 92% of the SSRI group reporting only mild residual depression compared to just 28% in the non-SSRI arm. Anxiety levels also lessened considerably, as 92% of SSRI patients had mild symptoms while 80% of non-SSRI patients continued moderate anxiety. Sleep quality in the SSRI group dramatically shifted as well, from poor to good. Though stress levels were fairly comparable between groups, overall mental health status was substantially higher for SSRI patients by the conclusion of the 6-month intervention. Therefore, in a multitude of meaningful ways, SSRIs conferred advantages extending well beyond mood to impact other psychosocial aspects relevant to patient wellbeing. Another salient finding was that adherence to both antihypertensive and antidepressant medications were superior in the SSRI treatment group. With more reliable intake of these agents, compounding benefits would be expected over the 6-month timespan. Rates of lifestyle modification implementation were also higher among SSRI patients, further potentiating therapeutic effects. Though unlikely the full explanation, the collective improvements across these spheres of functioning among SSRI patients probably contributed in a synergistic manner to the blood pressure reductions observed. In summary, this well-designed matched study provides compelling evidence that SSRIs lower systolic blood pressure incrementally beyond non-SSRI usual care among hypertensive patients who have comorbid MDD. Mental health gains in areas of mood, anxiety, and sleep were substantial as well. While the precise mechanisms behind the antihypertensive effects remain speculative, the combination of direct SSRI effects along with enhanced adherence and healthy behavior change facilitated by improved neuropsychiatric status together likely yielded additive benefits on cardiovascular risk reduction. Determining any mediating pathways is an important direction for future investigations in this population exhibiting psychological-physiological comorbidity. A Review on Antidepressant Drugs Effects on Blood Pressure summarizes the literature on the effect of antidepressant drugs on blood pressure. It states that SSRIs are characterized by limited effects on autonomic system activity and a lower impact on blood pressure. A large meta-analysis found no significant differences in systolic and diastolic blood pressure for SSRIs compared to placebo [12]. A study by Romańczyk et al. [13], found that SSRIs did not have a statistically significant effect on systolic or diastolic blood pressure compared to placebo. However, it also noted that the use of SSRIs significantly increased the reporting odds ratio (ROR) of hypertension in a pharmacovigilance database [14]. The current study results, which demonstrate a significant reduction in systolic blood pressure among patients taking SSRIs, contrast with the findings of these recent studies. While some studies suggest that SSRIs have limited effects on blood pressure, the current study found a substantial reduction in systolic blood pressure 8.4 mmHg compared to the non-SSRI group 5.6 mmHg), with a statistically significant between-group difference of 2.8 mmHg. This discrepancy could be due to differences in study design, patient populations, or other factors. In summary, while recent studies generally suggest that SSRIs have limited effects on blood pressure, your study found a significant antihypertensive effect of SSRIs in patients with concurrent major depressive disorder and hypertension [14]. This difference highlights the importance of considering individual study designs and patient populations when interpreting results. One recent investigation delves into the complex interactions between SSRIs, autonomic

dysfunction, and hypertension, particularly in patients with panic disorder. This study emphasizes the historical association between anxiety disorders, including panic disorder, and elevated cardiovascular mortality, suggesting a link between autonomic dysfunction common in both hypertension and panic disorder. Although not directly focusing on the antihypertensive effects of SSRIs, it provides an indirect support by discussing how SSRIs, through their serotonergic action, could potentially influence autonomic nervous system abnormalities, thereby affecting blood pressure regulation. This body of work implies that SSRIs may exert a beneficial effect on blood pressure among patients with anxiety disorders, potentially through mechanisms involving serotonin's role in autonomic regulation [15]. Another piece of research focused on SSRIs' impact on hippocampal plasticity and memory, indirectly touching upon their systemic effects, including on blood pressure. Through examining the neurophysiological and behavioral impacts of SSRIs like fluvoxamine and fluoxetine, the study found that these drugs modulate responses to pro-inflammatory stimulation, affecting hippocampal plasticity and memory. Although primarily targeting the brain's hippocampal region, the findings hint at the broad systemic actions of SSRIs, which could include modulation of blood pressure via neurosteroid synthesis and sigma-1 receptor interactions. This research suggests a possible biochemical pathway through which SSRIs could exert systemic effects, including on blood pressure, by influencing neuroinflammatory responses and neuroplasticity [16]. Comparing these findings with your study reveals a complex picture of SSRIs' systemic effects, including their potential to lower blood pressure. While your study provides direct evidence of SSRIs' antihypertensive effects in a comorbid MDD and hypertension population, the cited research offers insights into the broader physiological mechanisms that might mediate these effects. Specifically, the modulation of autonomic dysfunction and neuroinflammatory responses could play a role in the antihypertensive action of SSRIs observed in your study. The collective evidence points towards a promising, albeit complex, role of SSRIs in managing hypertension, particularly among patients with comorbid psychiatric disorders. However, further research is warranted to fully understand the mechanisms underlying these effects and to explore the therapeutic potential of SSRIs in treating hypertension, considering their psychopharmacological action and impact on the autonomic nervous system and neuroinflammatory pathways [16]

Conclusion

This matched interventional study provides evidence that treating patients with concurrent major depressive disorder and hypertension using selective serotonin reuptake inhibitors results in significant incremental reductions in systolic blood pressure over 6 months compared to non-SSRI antidepressants. Patients on SSRIs additionally experienced marked improvements in depression, anxiety, sleep, adherence to treatments, implementation of healthy lifestyle modifications, and overall mental health. The reductions in systolic blood pressure with SSRI treatment are clinically meaningful, lowering by 8.4 mmHg versus 5.6 mmHg in the non-SSRI group. This significant between-group difference of 2.8 mmHg underscores noteworthy cardiovascular benefits of SSRIs extending beyond their psychotropic effects. Though the precise mechanisms behind the blood pressure-lowering impacts remain uncertain, it is likely mediated in part by the compounding positive effects of SSRIs across psychosocial domains including mood, behavior, and stress responses. In conclusion, SSRIs confer advantages beyond alleviating depressive symptoms to lower systolic blood pressure among hypertensive patients with major depression, probably facilitated through both direct vascular actions along with indirect improvements in anxiety, sleep, treatment compliance, and lifestyle factors. Further research should explore the mediating pathways involved, as well as validate these cardiovascular protective effects of SSRIs through larger trials. Nonetheless, this study provides initial evidence that SSRIs may be considered an effective early intervention for concurrent hypertension and depression to optimize both mental health and physical health outcomes in this population.

Ethical Approval

All of the individuals were given thorough information about the study and the procedures involved, and their informed consent was acquired on a form approved by the ethics committee of the University of Baghdad, College of Medicine (No. 771333, 24-1-2023, with ref. number 781)

Data Availability

Underlying data: Raw data for [**Relationship between selective serotonin reuptake inhibitors and hypertension**]
This project contains following Data:
https://figshare.com/account/items/25674396/edit
Doi: 10.6084/m9.figshare.25674396

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