Original Study

Effect of Neutral Spinal Douche on Blood Pressure Among Healthy Adults : A Pilot Study

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ABSTRACT

Background: Blood pressure is governed largely by the autonomic nervous system (ANS), and interventions that improve autonomic balance are considered beneficial for cardiovascular regulation. Hydrotherapy, the therapeutic use of water, is widely practised in naturopathy and produces physiological effects that vary with the temperature and method of application; neutral-temperature applications are thought to promote parasympathetic dominance. Evidence on the neutral spinal douche specifically, however, remains limited, and this pilot study was therefore undertaken to evaluate its effect on systolic and diastolic blood pressure (SBP and DBP) in healthy adults and to generate preliminary evidence of its effectiveness. **Methodology:** Ten healthy individuals (four men and six women; aged 18–25 years) were enrolled for the study. A neutral spinal douche (34–36°C) was administered over the spinal region for 5 min once daily in the morning for seven consecutive days. SBP and DBP were recorded before and after the intervention on each of the seven days using standardised procedures. **Results:** The mean SBP fell from 115.0 ± 9.7 mmHg (Day 1, pre-intervention) to 99.1 ± 8.8 mmHg (Day 7, post-intervention), a reduction of 15.9 mmHg (paired t-test, $p = 0.0002$). The mean DBP decreased from 77.8 ± 5.5 mmHg to 71.3 ± 5.3 mmHg, a reduction of 6.5 mmHg ($p = 0.019$), with a consistent day-on-day downward trend observed for both parameters. **Conclusion:** Repeated application of a neutral spinal douche was associated with a significant reduction in resting SBP and DBP in healthy adults, supporting its potential as a simple, safe, and non-invasive hydrotherapy intervention for cardiovascular health pending confirmation in larger randomised controlled trials.

Key words: Autonomic Nervous System, Blood Pressure, Naturopathy.

Blood pressure (BP) is the force exerted by circulating blood against the arterial walls and is clinically expressed as systolic (SBP) and diastolic (DBP) blood pressure. It is governed largely by the autonomic nervous system (ANS), and interventions that shift the sympatho-vagal balance toward parasympathetic dominance are widely regarded as beneficial for cardiovascular regulation and for preventing stress-related elevations in blood pressure [1]. Management strategies range from pharmacological therapy to lifestyle and complementary approaches, among which hydrotherapy, the therapeutic application of water in varying forms and temperatures, occupies a central place in naturopathic practice, with reported effects spanning the cardiovascular, respiratory, musculoskeletal, and nervous systems [2,3]. The physiological response depends on the temperature used: cold applications produce an initial sympathetic and pressor response, hot applications produce vasodilatation and a transient fall in vascular resistance. In contrast, neutral-temperature applications (approximately 33–36°C) are considered to act primarily by inducing generalised relaxation and reducing sympathetic outflow without imposing thermal stress.Several forms of spinal hydrotherapy, including cold spinal bath, cold spinal spray, neutral spinal bath, neutral spinal spray, and neutral spinal compress, have been studied for their cardiovascular and autonomic effects, acting through cutaneous thermoreceptor stimulation and reflex modulation of spinal and supraspinal autonomic centres [4–9]. Controlled immersion studies have similarly shown that neutral- and warm-temperature water exposure lowers heart rate and blood pressure compared with ambient-air controls, whereas colder immersion evokes a more pronounced sympathetic and hormonal response [6]. A systematic review of these hydrotherapeutic procedures concluded that most modalities improve parasympathetic activity and are effective in reducing blood pressure in both healthy and hypertensive populations, though it noted that the methodological quality of the available evidence remains generally low [10].

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The neutral spinal douche, a stream of neutral-temperature water directed over the spinal region, is used within naturopathic practice, but despite the physiological plausibility of its action on autonomic tone, it has received very little direct research attention, and no dedicated study evaluating its effect on resting BP in healthy adults could be identified. Given the close anatomical relationship between spinal cutaneous afferents and central autonomic cardiovascular control, and the encouraging findings reported for related neutral-temperature spinal procedures, this pilot study was undertaken to evaluate the effect of a seven-day course of neutral spinal douche on SBP and DBP in healthy young adults, comparing pre- and post-intervention values to generate preliminary evidence for the design of a larger, adequately powered randomised controlled trial [10].

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This was a single group, pre/post-test, pilot interventional study conducted at the GTN Medical College of Naturopathy and Yogic Sciences Research Centre, Dindigul.

2.2 Participants

Ten healthy volunteers (four males and six females), aged 18–25 years, were recruited by convenience sampling from among the students of the institution. Participants who satisfied the inclusion criteria were enrolled after providing written informed consent.

2.3 Inclusion Criteria

Apparently healthy adults aged 18–25 years with a normal range of resting BP at screening, who are willing to provide written informed consent and can comply with the seven-day intervention protocol.

2.4 Exclusion Criteria

Patients diagnosed with hypertension, cardiovascular, renal, or endocrine disorders or having any acute febrile illness, skin infection, or open wound in the spinal region were excluded from the study. Those with pregnancy, hydrophobia, or psychological illness, and those using medications known to affect BP or autonomic function were also excluded. Any condition contraindicating hydrotherapy was also not included in the study.

2.5 Intervention: Neutral Spinal Douche

The neutral spinal douche was administered using a douche apparatus delivering a steady stream of water maintained at a neutral temperature of 34–36°C. With the participant seated or standing comfortably, the water stream was directed over the spinal region, from the nape to the sacrum, for 5 minutes (Figure 1). The intervention was administered once daily in the morning, on an empty or light stomach, for seven consecutive days under standardised environmental conditions of ambient temperature and privacy.



Figure 1. Administration of Neutral spinal douche

2.6 Outcome Measures

The primary outcome measures were SBP and DBP. Blood pressure was recorded in the seated position after a rest period of at least 5 min, using a calibrated digital sphygmomanometer.

2.7 Procedure

Baseline (pre-intervention) SBP and DBP were recorded before the first session of neutral spinal douche on Day 1. Participants then received the intervention once daily for seven consecutive days, and post-intervention SBP and DBP were recorded after the completion of the seventh session. All measurements were taken by the same trained investigator at approximately the same time of day to minimise diurnal variation.

2.8 Statistical Analysis

Data were entered and analysed using IBM SPSS Statistics (IBM Corp., Armonk, NY, USA) and expressed as mean ± standard deviation. Pre- and post-intervention SBP and DBP were compared using the paired t-test or Wilcoxon signed-rank test, as appropriate for the distribution of the data, with $p < 0.05$ considered statistically significant. Given the small sample size, results were interpreted as preliminary/descriptive evidence rather than definitive statistical inference.

3. RESULTS

Ten healthy volunteers (4 males, 6 females; mean age within the 18–25-year range) completed the seven-day intervention with no dropouts and no adverse events reported. Table 1 summarises the demographic profile of the participants, and Table 2 presents the pre- and post-intervention blood pressure values.

Table 1. Demographic profile of participants (N = 10)

Characteristic	Value
Total participants	10
Male	4
Female	6
Age range (years)	18–25

The sample was small and predominantly female, which limits the generalisability of the findings across sex and to broader age groups beyond young adulthood.

Table 2. Overall pre- and post-intervention BP (Day 1 baseline vs Day 7 post-session), mean ± SD, mmHg (n = 10)

Parameter	Day 1 Pre (baseline)	Day 7 Post (final)	p-value*
SBP (mmHg)	115.0 ± 9.7	99.1 ± 8.8	0.0002
DBP (mmHg)	77.8 ± 5.5	71.3 ± 5.3	0.019

**Paired t-test, Day 1 pre-intervention value vs Day 7 post-intervention value.*

This overall pre-post comparison indicates that the seven-day course of neutral spinal douche produced a clinically meaningful and statistically significant lowering of resting blood pressure, with the effect appearing more pronounced for the systolic than the diastolic parameter.

Table 3. Day-wise mean pre- and post-session BP across the 7-day intervention (mean ± SD, mmHg, n = 10)

Day	Pre SBP	Post SBP	Pre DBP	Post DBP
1	115.0 ± 9.7	109.4 ± 10.3	77.8 ± 5.5	74.4 ± 5.1
2	109.4 ± 15.0	108.4 ± 11.5	77.0 ± 10.0	77.2 ± 3.5
3	106.2 ± 12.9	99.5 ± 11.3	73.2 ± 9.4	71.8 ± 7.2
4	113.0 ± 7.1	102.3 ± 8.9	77.3 ± 9.9	76.3 ± 9.5
5	110.9 ± 13.1	104.2 ± 8.6	75.2 ± 6.1	75.5 ± 7.5
6	107.9 ± 5.7	101.1 ± 6.0	74.6 ± 5.0	71.6 ± 6.2
7	106.1 ± 8.6	99.1 ± 8.8	73.9 ± 5.6	71.3 ± 5.3

BP was recorded before and after every session across the seven days. Table 3 shows two overlapping patterns: an immediate within-session reduction (pre- to post-session, each day), and a gradual downward drift in the pre-session (resting) value across the week. Together, these indicate that the response to neutral spinal douche comprises both an acute, per-session effect and an accumulating effect of repeated exposure over and above the immediate response to a single session.

Figures 2 and 3 illustrate that the fall in SBP across the week was steady and consistent, whereas the diastolic trend was comparatively flatter with more day-to-day fluctuation, visually reinforcing that the cumulative effect of the intervention was stronger for SBP than for DBP.

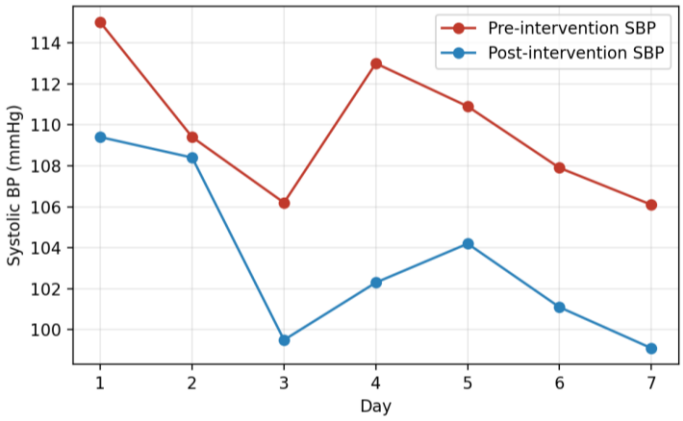


Figure 2. Mean SBP (pre- and post-session) across the 7-day intervention.

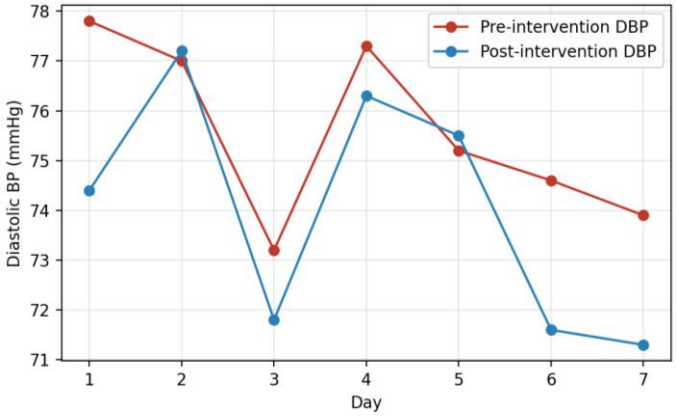


Figure 3. Mean DBP (pre- and post-session) across the 7-day intervention.

Pooling all 70 pre/post session pairs across the seven days (10 participants × 7 days), the immediate within-session reduction was also significant for SBP (mean 109.8 ± 10.8 mmHg pre vs 103.4 ± 9.9 mmHg post; $p < 0.001$) and showed a similar, though not statistically significant, downward trend for DBP (mean 75.6 ± 7.5 mmHg pre vs 74.0 ± 6.7 mmHg post; $p = 0.060$). The resting (pre-session) SBP itself fell significantly from Day 1 to Day 7 ($p = 0.008$), while the corresponding fall in resting DBP did not reach significance ($p = 0.107$). This pattern indicates that both an immediate, single-session effect and a separate, cumulative effect on resting BP are present, and that the cumulative effect was more consistent for SBP than for DBP. No participant reported discomfort, dizziness, or any adverse event during or after the intervention period, supporting the safety and tolerability of the procedure.

DISCUSSION

The present pilot study found that seven consecutive days of neutral spinal douche produced a significant reduction in both SBP and DBP in healthy young adults. This study suggests that repeated neutral spinal douche produced not only a transient relaxation response but also a cumulative shift in resting

autonomic tone, and the absence of any adverse events supports the safety and tolerability of the procedure.

Comparable findings have been reported for related neutral-temperature spinal hydrotherapy procedures. A single session of neutral spinal bath has been shown to produce favourable heart rate variability changes indicative of parasympathetic dominance in healthy volunteers [1], while neutral immersion bath with Epsom salt and a full neutral spinal compress have each been reported to reduce sympathetic tone and BP in hypertensive individuals [4,5]. Longer-term neutral-temperature water immersion has similarly been associated with reductions in BP, albeit without accompanying change in other cardiovascular risk factors [11,12], and thermal hydrotherapy combining warm and cold applications has been shown to improve haemodynamic function in chronic heart failure [13]. These findings, together with a systematic review reporting that most hydrotherapeutic modalities improve parasympathetic activity and BP regulation, support an autonomic mechanism broadly consistent with the reduction observed in the present study, while extending this evidence specifically to the neutral spinal douche technique, which has not previously been studied in isolation for its effect on BP in healthy adults [10].

Several limitations of the present study should be acknowledged. The sample size was small (n = 10), there was no control or comparison group, and the study was not blinded, all of which limit causal inference and increase susceptibility to regression to the mean, placebo/relaxation effects, and observer bias. Daily measurement over only seven days does not establish how long any benefit persists after the intervention is stopped, and objective autonomic markers such as heart rate variability were not assessed alongside BP. As a pilot study, these findings should be regarded as hypothesis-generating rather than confirmatory; future research should include larger, randomised, controlled, and blinded trials with extended follow-up and concurrent autonomic assessment to confirm the observed effect and clarify its underlying mechanism before any clinical recommendation is made.

CONCLUSION

This pilot study suggests that a seven-day course of neutral spinal douche significantly reduces SBP and DBP in healthy adults, supporting its potential as a safe, simple, and non-invasive hydrotherapy intervention for cardiovascular health, pending confirmation in larger randomised controlled trials.

REFERENCES

1. Goley A, Mooventhan A, Manjunath NK. Comparative study on effect of neutral spinal bath and neutral spinal spray on blood pressure, heart rate and heart rate variability in healthy volunteers. J Complement Integr Med. 2018;16(2):20180118.
2. Fleming SA, Gutknecht NC. Naturopathy and the primary care practice. Prim Care. 2010;37(1):119-136.
3. Mooventhan A, Nivethitha L. Scientific evidence-based effects of hydrotherapy on various systems of the body. N Am J Med Sci. 2014;6(5):199-209.
4. Joicy MS, Shetty GB, Sujatha KJ, Shetty P. Effect of neutral immersion bath with Epsom salt on hypertensive individuals. Indian J Integr Med. 2021;1(3):75-79.
5. Bansal P, Kannarpady Janardan S, Shetty P. The immediate effect of neutral spinal compress on heart rate variability in hypertensive individuals. J Complement Integr Med. 2022;19(2):429-434.
6. Sramek P, Simeckova M, Jansky L, Savlikova J, Vybiral S. Human physiological responses to immersion into water of different temperatures. Eur J Appl Physiol. 2000;81(5):436-442.
7. Shetty GB, Shetty B, Shetty P. Immediate effect of cold spinal bath on autonomic and respiratory variables in hypertensives. World J Pharm Med Res. 2016;2(5):236-240.
8. Paily AK, Shetty GB, Shetty P, Sujatha KJ. Immediate effect of cold spinal spray on autonomic variables in hypertensive individuals: a randomised control trial. Int J Sci Res. 2020;9(10):396-401.
9. Avanthika G, Sujatha KJ, Shetty P. Immediate effect of cold and neutral spinal spray on autonomic functions in healthy volunteers: a comparative study. IOSR J Dent Med Sci. 2017;16(11):18-24.
10. Abinaya S, Vijay A, Nivethitha L, Mooventhan A, Manavalan N. Effects of various hydrotherapeutic procedures on heart rate variability and blood pressure: a systematic review. Adv Integr Med. 2025;12(3):100500.
11. Soni G, Soni R, Puri J. Regulation of respiratory rate, body temperature, pulse rate and lung functions effect by neutral immersion bath. Biol Forum Int J. 2013; 5:27-30.
12. Naumann J, Sadaghiani C, Bureau N, Schmidt S, Huber R. Outcomes from a three-arm randomized controlled trial of frequent immersion in thermoneutral water on cardiovascular risk factors. BMC Complement Altern Med. 2016; 16:250.
13. Michalsen A, Lüdtke R, Bühring M, Spahn G, Langhorst J, Dobos GJ. Thermal hydrotherapy improves quality of life and hemodynamic function in patients with chronic heart failure. Am Heart J. 2003;146(4):728-733.
14. Mooventhan A. Immediate effect of ice bag application to head and spine on cardiovascular changes in healthy volunteers. Int J Health Allied Sci. 2016;5(1):53-56.
15. Vyas SC, Mooventhan A, Manjunath NK. Effect of hot arm and foot bath on heart rate variability and blood pressure in healthy volunteers. J Complement Integr Med. 2019;17(1):20180181.

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