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**Research Article** 

# A PILOT STUDY ON THE INFLUENCE OF NAVRATRI UPVASA AND VIRECHANA ON OXIDATIVE STRESS AND RELATED BIOMARKERS

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# ABSTRACT

Introduction Oxidative stress plays a significant role in various diseases, and traditional Ayurvedic treatments like Navratri Upvasa (Shamana) and Virechana (Shodhana) are believed to influence oxidative stress levels. This pilot study aimed to assess the effects of these Ayurvedic therapies on oxidative stress biomarkers during Sharad Rutu. Methods: Thirty healthy volunteers aged 20–40 years were randomly assigned to three groups: Group A (Navratri Upvasa), Group B (Virechana), and Group C (control group). The study evaluated Superoxide Dismutase (SOD) and Malondialdehyde (MDA) as biomarkers for oxidative stress, along with Stress Index and Protective Index. Pre- and post-treatment measurements were taken, and statistical analysis was performed to compare the groups. **Results:** The analysis of SOD and MDA levels showed no significant differences among the three groups. The SOD levels for the Navratri Upvasa group were  $1.4722 \pm 0.4752$ , Virechana group  $1.3359 \pm 0.4824$ , and control group  $1.6548 \pm 0.4287$  (F = 1.1953, p = 0.3181). Similarly, MDA levels showed no significant differences (F = 0.4775, p = 0.6254). The Stress Index and Protective Index also did not show significant changes across the groups. **Discussion:** The findings suggest that there was no statistically significant effect of Navratri Upvasa or Virechana on oxidative stress or related biomarkers during the study period. Conclusion: The pilot study found no significant changes in oxidative stress markers following Navratri Upvasa or Virechana therapies. Further research with larger sample sizes and extended treatment durations is necessary to conclusively determine their effectiveness.

#### **KEYWORDS**

Oxidative stress, Navratri Upvasa, Virechana, Ayurvedic treatments, Superoxide Dismutase, Malondialdehyde, Stress Index, Protective Index, pilot study.

#### **INTRODUCTION**

Oxidative stress (OS), defined as an imbalance between reactive oxygen species (ROS) and the body's antioxidant defenses, is a key factor in the development of various diseases, including cardiovascular diseases, diabetes, and neurodegenerative disorders.[1] ROS are highly reactive molecules that can damage cellular components such as lipids, proteins, and DNA, leading to cellular dysfunction and inflammation. Antioxidants, both enzymatic and non-enzymatic, help neutralize ROS, protecting the body from their damaging effects.[2]

In traditional Ayurvedic medicine, practices such as Virechana (therapeutic purgation) and Navratri Upvasa (fasting) are believed to have detoxifying and healing properties.[3]Virechana is a purgative therapy that aims to eliminate toxins from the body, while Navratri Upvasa is a fasting regimen that focuses on cleansing and rejuvenating the body. While there is anecdotal evidence supporting the health benefits of these practices, scientific data on their effects on oxidative stress and antioxidant defense mechanisms remain scarce.[5]

This pilot study aims to assess the impact of Virechana and Navratri Upvasa on oxidative stress and antioxidant levels in healthy individuals. By evaluating changes in biomarkers of oxidative stress and antioxidant defense before and after the interventions, this study seeks to provide preliminary insights into the potential role of these Ayurvedic practices in improving oxidative balance.

# METHODOLOGY

**Study Design:** This was an open-label, parallel-group pilot study conducted at Mahatma Gandhi Ayurved College, Hospital & Research Centre, Salod (H), Wardha to evaluate the efficacy of Virechana (Shodhana Chikitsa) and Navratri Upvasa (Shamana) in reducing oxidative stress during the Sharad Rutu (autumn season). Ethical approval was obtained from the Institutional Review Board, and written informed consent was obtained from all participants.

# **Ethical Considerations**

The study has ethical approval (MGACHRC/IEC/Oct-2022/607) and adheres to guidelines ensuring participant safety and informed consent.

**Selection of Patients:** Participants were selected using a simple randomization sampling method. Thirty healthy volunteers aged 18–50 years were randomly assigned to three groups: Group A (Navratri Upvasa), Group B (Virechana), and Group C (Non-interventional control group). Ten participants were included in each group. Exclusion criteria included the presence of chronic diseases, use of medications that affect oxidative stress or antioxidant levels, smoking, alcohol consumption, or participation in other detoxification programs within the past three months.

# Withdrawal Criteria:

Participants experiencing adverse effects, such as diarrhea or weakness, will be withdrawn from the study and provided with treatment at no cost to ensure their well-being.

# **Interventions:**

- **Group A Navratri Upvasa (Shamana):** Participants in this group followed the fasting regimen traditionally observed during the Navratri festival. This involved a controlled fasting period of 9 days, where participants consumed only specific foods such as fruits, nuts, and water during the fasting days.
- **Group B Virechana** (Shodhana Chikitsa): Participants in this group underwent a detoxification therapy consisting of preparatory herbal treatments followed by a purgative therapy aimed at eliminating toxins from the gastrointestinal tract. This intervention lasted for 7 days.
- Group C Non-interventional Control Group: Participants in this group did not receive any interventions and continued their normal routine during the study period.

**Outcome Measures:** The study focuses on several key variables to analyze the outcomes. The independent variables include *Prakriti* (body constitution), *Agni* (digestive fire), and *Koshtha* (bowel type), which influence the physiological processes being studied. The dependent variables are Superoxide Dismutase (SOD), Malondialdehyde (MDA), Stress Index, and Protective Index, which serve as measurable indicators of oxidative stress, antioxidant status, and overall protective mechanisms. These dependent variables will

**Statistical Analysis:** Descriptive statistics were used to summarize baseline characteristics and intervention effects. Paired t-tests were used to compare pre- and post-intervention values for each marker within each group. A p-value of <0.05 was considered statistically significant. All data were analyzed using SPSS version 22.

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Table 1: OBSERVATION AND ANALYSIS OF PILOT STUDY:

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						Lower	er Bou				
						Bound	nd			F	Sig.
SOD	NAVRA TRI UPVAS A	10	1.472 2	0.475 20	0.1 50 27	1.1322	1.81 21	0.98	2.13		
	VIRECH ANA GROUP	10	1.335 9	0.482 40	0.1 52 55	0.9908	1.68 10	0.70	2.13	1.19	0.31
(FIC)	CONTR OL	10	1.654 8	0.428 71	0.1 35 57	1.3481	1.96 14	0.70	2.08		01
	Total	30	1.487 6	0.465 82	0.0 85 05	1.3137	1.66 16	0.70	2.13		
	NAVRA TRI UPVAS A	10	1.677 4	0.493 61	0.1 56 09	1.3243	2.03 05	1.10	2.50		
MDA (Pre)	VIRECH ANA GROUP	10	1.484 8	0.498 22	0.1 57 55	1.1284	1.84 12	0.78	2.23	0.47 75	0.62 54
	CONTR OL	10	1.664 7	0.487 33	0.1 54 11	1.3161	2.01 33	0.51	2.13		
	Total	30	1.609 0	0.484 11	0.0 88 39	1.4282	1.78 97	0.51	2.50		
	NAVRA TRI UPVAS A	10	1.083 0	0.497 65	0.1 57 37	0.7270	1.43 90	0.62	2.22		
STRE SS INDE	VIRECH ANA GROUP	10	0.873 6	0.359 30	0.1 13 62	0.6166	1.13 06	0.43	1.65	0.89	0.41
X (Pre)	CONTR OL	10	0.920 8	0.159 96	0.0 50 59	0.8064	1.03 52	0.70	1.21	95	80
	Total	30	0.959 1	0.364 94	0.0 66 63	0.8229	1.09 54	0.43	2.22		
PROT TECTI VE	NAVRA TRI UPVAS A	10	0.851 2	0.374 59	0.1 18 45	0.5832	1.11 92	0.53	1.68	0.84	0.44
X (Pre)	VIRECH ANA GROUP	10	0.708 4	0.314 28	0.0 99 38	0.4835	0.93 32	0.18	1.21	- 09	23

	CONTR OL	10	0.866 3	0.178 56	0.0 56 47	0.7385	0.99 40	0.64	1.20		
	Total	30	0.808 6	0.298 89	0.0 54 57	0.6970	0.92 02	0.18	1.68	-	
	NAVRA TRI UPVAS A	10	0.781 2	0.360 13	0.1 13 88	0.5236	1.03 89	0.32	1.32		
SOD	VIRECH ANA GROUP	10	0.728 9	0.393 21	0.1 24 34	0.4476	1.01 02	0.22	1.61	0.92	0.40
(Post)	CONTR OL	10	0.590 8	0.169 97	0.0 53 75	0.4692	0.71 24	0.41	1.00	/3	79
	Total	30	0.700 3	0.322 30	0.0 58 84	0.5800	0.82 07	0.22	1.61		
	NAVRA TRI UPVAS A	10	0.529 5	0.219 72	0.0 69 48	0.3723	0.68 66	0.21	0.86		
MDA (Post)	VIRECH ANA GROUP	10	0.535 1	0.280 95	0.0 88 84	0.3341	0.73 60	0.12	1.01	0.10 07	0.90 45
	CONTR OL	10	0.575 6	0.248 57	0.0 78 60	0.3978	0.75 34	0.41	1.25		
	Total	30	0.546 7	0.243 09	0.0 44 38	0.4559	0.63 75	0.12	1.25		
	NAVRA TRI UPVAS A	10	1.555 0	0.736 80	0.2 33 00	1.0279	2.08 21	0.76	3.17		
STRE SS INDE	VIRECH ANA GROUP	10	1.784 6	1.105 83	0.3 49 69	0.9935	2.57 57	0.62	4.63	0.28	0.75
X (Post)	CONTR OL	10	1.800 2	0.436 94	0.1 38 17	1.4876	2.11 27	1.00	2.44	90	13
	Total	30	1.713 2	0.787 55	0.1 43 79	1.4192	2.00 73	0.62	4.63		
PROT TECTI VE	NAVRA TRI UPVAS A	10	2.239	1.045 74	0.3 30 69	1.4911	2.98 72	1.16	4.67	0.98	0.38
INDE X (Post)	VIRECH ANA GROUP	10	2.889 2	2.478 19	0.7 83 67	1.1164	4.66 20	0.99	8.25	82	55

World Journal of Pharmaceutical Science & Technology

CONTR	10	1.915	0.485	0.1	1.5680	2.26	0.80	2.44	
OL		1	18	53		22			
				43					
Total	30	2.347	1.577	0.2	1.7588	2.93	0.80	8.25	
		8	38	87		68			
				99					

Table analyzed the levels of SOD, MDA, Stress Index, and Protective Index across three groups: Navratri Upvasa, Virechana, and Control. For **SOD levels**, the Navratri Upvasa group had a mean of  $1.4722 \pm 0.4752$ , the Virechana group had  $1.3359 \pm 0.4824$ , and the Control group had  $1.6548 \pm 0.4287$ . The overall mean was  $1.4876 \pm 0.4658$ , and no significant differences were observed among the groups (F = 1.1953, p = 0.3181). Similarly, for **MDA levels**, the Navratri Upvasa group had a mean of  $1.6774 \pm 0.4936$ , the Virechana group had  $1.4848 \pm 0.4982$ , and the Control group had  $1.6647 \pm 0.4873$ , with an overall mean of  $1.6090 \pm 0.4841$ . Again, no significant differences were observed (F = 0.4775, p = 0.6254).

The **Stress Index** showed mean values of  $1.0830 \pm 0.4977$  for the Navratri Upvasa group,  $0.8736 \pm 0.3593$  for the Virechana group, and  $0.9208 \pm 0.1600$  for the Control group, with an overall mean of  $0.9591 \pm 0.3649$ . No significant differences were found among the groups (F = 0.8995, p = 0.4186). For the **Protective Index**, the Navratri Upvasa group had a mean of  $0.8512 \pm 0.3746$ , the Virechana group had  $0.7084 \pm 0.3143$ , and the Control group had  $0.8663 \pm 0.1786$ , with an overall mean of  $0.8086 \pm 0.2989$ . No significant differences were observed (F = 0.8409, p = 0.4423). Overall, the analysis indicated no statistically significant differences among the three groups for any of the measured parameters.

# DISCUSSION

The present pilot study aimed to evaluate the impact of two Ayurvedic interventions—Navratri Upvasa (Shamana) and Virechana (Shodhana) on oxidative stress, as indicated by the biomarkers Superoxide Dismutase (SOD) and Malondialdehyde (MDA), as well as other indices like Stress and Protective Indices. The results presented in Table 1 suggest that there were no statistically significant differences between the three study groups (Navratri Upvasa, Virechana, and Control) for any of the measured parameters, including SOD, MDA, Stress Index, and Protective Index, both pre- and post-intervention.

In terms of SOD levels, the Navratri Upvasa group had the highest mean pre-intervention value (1.4722), followed by the Control group (1.6548) and the Virechana group (1.3359). However, no significant reduction in oxidative stress was observed across the groups, as evidenced by the F-value (1.1953, p = 0.3181). Similarly, no significant changes were observed in MDA levels, a marker of lipid peroxidation, as the means across the groups were comparable, with an F-value of 0.4775 (p = 0.6254).

For the Stress Index, the Navratri Upvasa group exhibited a higher mean compared to the Virechana and Control groups, but no statistically significant difference was found (F = 0.8995, p = 0.4186). Likewise, the Protective Index did not show significant differences among the groups, with values ranging from 0.7084 (Virechana) to 0.8663 (Control).

These findings suggest that, in the context of this pilot study, the interventions did not yield marked differences in oxidative stress, stress responses, or protective indices. It is important to note that these results might be attributed to several factors such as the relatively short study duration, the individualized nature of the Ayurvedic interventions, or the small sample size. Further research with a larger sample size and extended intervention periods may be needed to determine the true efficacy of these treatments.

# CONCLUSION

In conclusion, this pilot study did not reveal any significant differences in oxidative stress or other related indices between the Navratri Upvasa, Virechana, and Control groups. Although there were variations in the measured parameters, these differences were not statistically significant, indicating that the studied Ayurvedic interventions did not have a pronounced effect on reducing oxidative stress or improving stress-related indices during Sharad Rutu. Further studies with a larger sample size and longer follow-up periods are recommended to validate these findings and explore the potential clinical benefits of Ayurvedic detoxification methods.

#### **Compliance with ethical standards:**

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# **Disclosure of conflict of interest:**

None conflict of interest in this review article

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