

Evaluation Of The Clinical Anti-Inflammatory Effects Of Homoeopathic Medicine Belladonna In Inflammatory Conditions: A Clinical Study

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ABSTRACT:

Background: Inflammation underlies numerous acute and chronic diseases. Homoeopathic Belladonna has been traditionally indicated for inflammatory conditions; however, clinical evidence remains limited. **Objective:** To evaluate the clinical anti-inflammatory effects of Homoeopathic Belladonna in patients with inflammatory conditions using biochemical and standardized clinical parameters. **Methods:** An observational pilot study was conducted on 65 patients with inflammatory conditions. Creative protein (CRP) was used as the primary objective marker. Pre- and post-treatment findings were statistically analysed using paired t-test and Z-test. **Results:** Clinical improvement was observed in 56/65 patients (86.15%). Significant reduction in CRP levels was noted ($p < 0.001$), with most elevated baseline values returning to near-normal levels. Most patients demonstrated improvement in both clinical presentation and biochemical parameters. **Conclusion:** Homoeopathic Belladonna demonstrated statistically significant anti-inflammatory effects in this pilot study. Large scale randomized controlled trials are required for further validation.

Keywords: Homoeopathy; Atropa belladonna; Anti-inflammatory effect; C- reactive protein

INTRODUCTION:

Plants are utilized as therapeutic agents since times immemorial in both organized and unorganized forms ^[1]. An herbal drug constitutes a major part in all traditional system of medicine ^[2]. Pharmacological activity of plants is often known as a result of millennia of trial and error but they have to be carefully investigated if we wish to develop a new drug that meet the criteria of modern treatment ^[3]. Homoeopathy has remained the most widespread and still a conventional mode of therapy. Homoeopathic medicines are prepared according to the methods endorsed in Homoeopathic pharmacopoeias. However, in the last few decades claims about the efficacy of Homoeopathic medicines and their high dilution are being revisited using validated pharmacological assays ^[4]. The principal manifestations of tissue damage include inflammation and haemorrhage. ^[5] Inflammation also promotes the formation of new blood vessels and tissue remodelling ^[6]. Healing of wounds whether from accidental injury or surgical intervention involves the activity of an intricate network of blood cells, tissue types, cytokines and growth factors ^[7]. Investigation of novel different medicinal plants from different regions of the world and their botanical utilization has increased all over the world including western world. We have a mechanistic information deficiency and a lack of possible differences amongst species from the same genus of a plant. The term anti-inflammatory refers to the attribute of a chemical substance alongside a treatment that can reduce inflammation. About half of analgesics are anti-inflammatory drugs, relieving pain by reducing inflammation as opposed to the mechanism of opioids, which affect our central

nervous system (CNS) Using over-the-counter with nonsteroidal prescription medicaments are frequently commended in case of distinctive neurosurgical practice. It is very important processing both analgesics along with anti-inflammatory activities which decidedly can bring upon several novel prospects for inflammation related diseases. ^[9(1)] The inflammatory response is the coordinate activation of signalling pathways that regulate inflammatory mediator levels in resident tissue cells and inflammatory cells recruited from the blood ^[8]. Inflammation is a common pathogenesis of many chronic diseases, including cardiovascular and bowel diseases, diabetes, arthritis, and cancer ^[10]. Although inflammatory response processes depend on the precise nature of the initial stimulus and its location in the body, they all share a common mechanism, 1) cell surface pattern receptors recognize detrimental stimuli; 2) inflammatory pathways are activated; 3) inflammatory markers are released; and 4) inflammatory cells are recruited. The most substantial fallout profiles of NSAIDs and steroidal drugs is, an escalating concern for natural compounds among peoples, for instance herbal therapeutics and dietetic supplementations are expended for many centuries to scaled down inflammation and painful sensation. There is confluence of naturally occurring bioactive compounds that too provide action in a similar mechanism as NSAIDs, which insert action by suppressing our inflammatory pathways. Furthermore, there are plies of naturally obtained chemical compounds that suppress nuclear factor- $\kappa\beta$ mediated inflammation pathways along with COX-pathway in our body. ^[11(2)] Reported anti-inflammatory herbal drugs with less toxicity:

Belladonna (*Atropa Belladonna*), a well-known medicinal plant in Homoeopathy, contains bioactive alkaloids such as atropine, scopolamine, and hyoscyamine, which exhibit various pharmacological effects^[12]. Traditionally used for its analgesic, antispasmodic, and anti-inflammatory properties, Belladonna's role in modulating inflammatory pathways remains a subject of scientific investigation^[13,14]. Inflammation is a complex biological response involving cytokine release, oxidative stress, and cellular damage. Murine cell models, particularly macrophages (RAW 264.7), provide a reliable platform to study the anti-inflammatory effects of natural compounds. The evaluation of Belladonna's potential in modulating inflammation includes phytochemical analysis, membrane stabilization assays, infusion contraction studies, and optical density-based cytokine quantification.^[14,15] While evidence supports the benefits of Homoeopathic Belladonna for inflammatory conditions, the mechanism of action of Homoeopathic dilutions of Belladonna is still unclear. Inflammatory markers are used in clinical applications to indicate normal versus pathogenic biological processes and may be predictive of inflammatory diseases. In this present study, we mainly focused on anti-inflammatory properties of Belladonna and investigated a range of Belladonna Homoeopathic dilutions (3C, 30C & 200C) and the mother tincture (MT) in murine cell culture models by measuring inflammatory markers such as tumour necrosis factor alpha (TNF α), interleukin-6 (IL-6), cyclooxygenase.

MATERIALS AND METHODOLOGY:

STUDY SETTING:

Patients will be selected from the OPD, IPD, Rural health centres of Maria Homoeopathic Medical College Hospital.

SELECTION OF SAMPLES:

Sample size - 65 cases

Sample technique - Purposive Sampling

STUDY DESIGN: Prospective observational study.

- A clinical approach to understand the anti-inflammatory effect of Belladonna and its significance in the management of inflammatory conditions, with emphasis on its role in reducing inflammatory markers.
- The study will be carried out in OPD, IPD and peripheral centres of Maria Homoeopathic Medical College and Hospital. The data will be collected and recorded in a stipulated case taking format.
- Systematic recording of symptoms is done on subsequent follow ups and assessment will be done.
- Statistical analysis of the collected data will be performed using IBM SPSS Statistics, with appropriate tests applied to compare outcomes; a p-value of <0.05 will be considered statistically significant.

SELECTION OF TOOLS:

- Pre-structured case record format.
- CRP used as primary parameter

DATA COLLECTION:

1. Interview technique including case taking based on the directions in Organon of Medicine in pre-structured case format.
2. Data will be obtained from the patients, bystanders and observation of physician.

3. Physical examination and investigations are done whenever necessary.

BRIEF OF PROCEDURES:

- Pre-diagnosed cases of 30 patients with inflammatory conditions will be selectively taken from the OPD, IPD, and Rural Health Centre.
- The case details will be recorded in a standardized pre-structured Homoeopathic case format.
- Clinical assessment of inflammation will be performed using symptomatology and relevant inflammatory markers such as C-reactive protein (CRP).
- Belladonna will be selected based on the totality of symptoms (similimum), and the potency and dosage will be determined according to the susceptibility of the patient at the time of prescription.
- Follow-up will be conducted once in seven days or thirty days for all cases to assess the anti-inflammatory response.

INCLUSION CRITERIA:

1. Patients of either gender.
2. Patients aged between 10 and 65 years.
3. Patients presenting with signs and symptoms suggestive of inflammation such as pain, redness, swelling, heat, or functional limitation.
4. Patients willing to participate and provide written informed consent.

5. Patients available for regular follow-up during the study period.

EXCLUSION CRITERIA:

1. Pregnant women
2. History of current primary inflammatory joint disease or primary rheumatological autoimmune disease other than RA
3. History of malignancy within the past 5 years.

INTERVENTION:

- The recording of the symptoms of the patients and medication given and their potency and administration were purely based on the Homoeopathic principles.
- At each follow-up CRP rate were used for pre- and post-assessments'

STATISTICAL TECHNIQUES AND DATA ANALYSIS:

- Paired t Test.
- Z test
- Bar chart, Pie-chart and Graphical representation.

ASSESSMENT CRITERIA:

- C-Reactive Protein (CRP) was used as the primary objective investigation parameter to assess inflammatory activity. Baseline and post-treatment CRP values were recorded in mg/L to evaluate biochemical response.

OBSERVATION AND RESULT:**1. DISTRIBUTION OF CASES ACCORDING TO AGE:**

SNO	AGE	COUNT
1	5-10	1
2	10-20	2
3	20-30	11
4	30-40	21
5	40-50	19
6	50-60	11
7	60-70	1

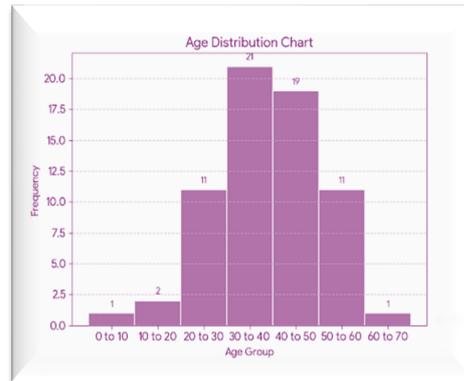


Table 1: Distribution of cases according to age Fig 1: Distribution of cases according to age

The majority of patients were in the 30–40 years age group (31.82%), followed by 40–50 years (28.79%), indicating a predominance in middle age. The 20–30 years and 50–60 years groups (16.67% each) showed moderate distribution. The younger (5–10: 1.52%, 10–20: 3.03%) and older age group (60–70: 1.52%) had minimal representation. Overall, the findings suggest that the condition mainly affects the 30–50 years age group, highlighting the importance of targeted management in this population.

2. DISTRIBUTION OF CASES ACCORDING TO GENDER:

No.	GENDER	COUNT
1	MALE	36
2	FEMALE	29
	TOTAL	65

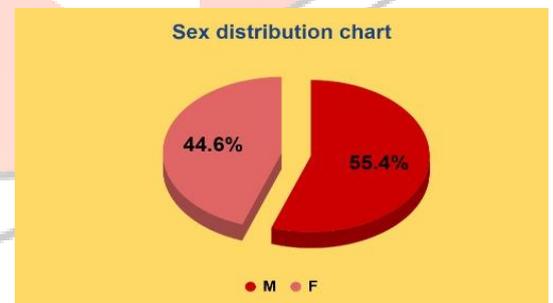


Table 2: Distribution of cases according to gender Fig 2: Distribution of cases according to gender

Out of the total 65 patients, males constituted 55.38% (36 cases), while females accounted for 44.62% (29 cases). This indicates a slight male predominance in the study population. However, the difference is not very large, suggesting that the condition affects both genders almost equally, with a marginally higher incidence among males. This variation may be attributed to differences in lifestyle, occupational exposure, and health-seeking behaviour between males and females.

3. DISTRIBUTION OF CASES ACCORDING TO DIAGNOSIS:

S.NO	DIAGNOSIS	COUNT
1	ACUTE BRONCHITIS	10
2	ACUTE TONSILITIS	10
3	ACUTE SINUSITIS	10
4	ACUTE GASTRITIS	10
5	ARTHRITIS	20
6	TRAUMA	05
	TOTAL	65

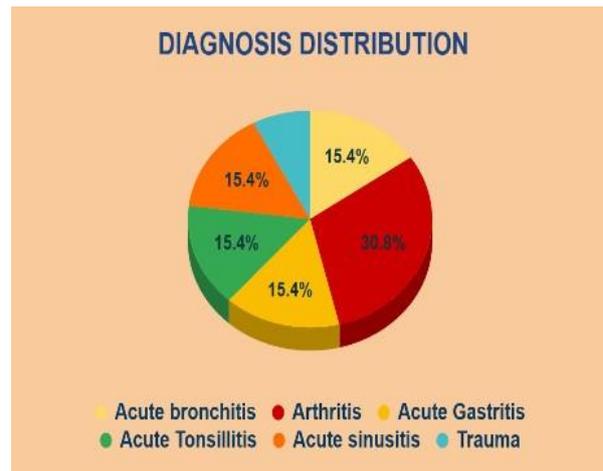


Table 3: Distribution of cases according to diagnosis Fig 3: Distribution of cases according to diagnosis

Among the study population, arthritis constituted the highest proportion (30.77%), indicating it as the most common condition. Acute conditions such as bronchitis, tonsillitis, sinusitis, and gastritis each accounted for 15.38%, showing an equal distribution among these inflammatory disorders. Trauma cases (7.69%) were the least represented. Overall, the findings suggest a higher prevalence of chronic inflammatory conditions like arthritis, while acute inflammatory conditions were moderately distributed in the study population.

4. DISTRIBUTION OF CASES ACCORDING TO POTENCY:

S NO	POTENCY	COUNT
1	200 C	30
2	30C	17
3	1M	18

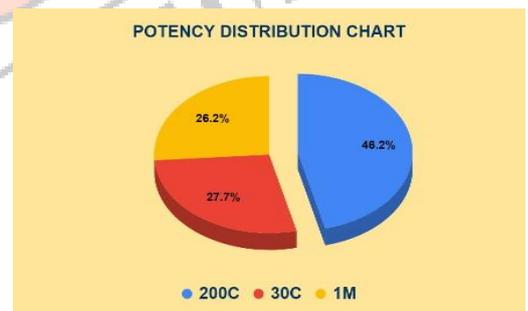
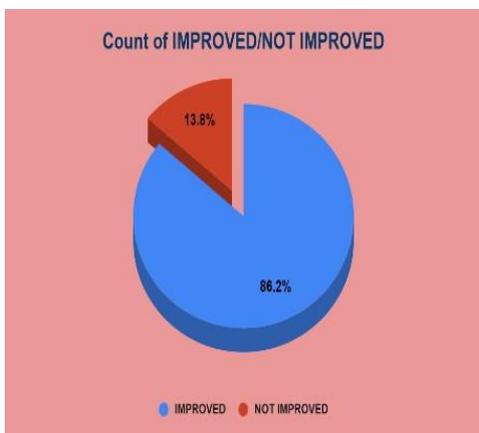


Table 4: Distribution of cases according to potency Fig 4: Distribution of cases according to potency

Among the prescribed potencies, 200C (46.15%) was the most frequently used, representing a moderate potency commonly preferred in clinical practice. This was followed by 1M (27.69%), a higher potency, and 30C (26.15%), a lower potency. The findings indicate that moderate potency (200C) was predominantly used, with selective use of higher and lower potencies based on individual case requirements.

5. DISTRIBUTION OF CASES ACCORDING TO IMPROVEMENT:



SNO	IMPROVED/NOT IMPROVED	COUNT
1	IMPROVED	56
2	NOT IMPROVED	9

Table 5: Distribution of cases according to improvement Fig 5: Distribution of cases according to improvement

Out of the total cases, a significant majority (86.15%) showed clinical improvement, whereas 13.85% did not exhibit noticeable improvement following treatment. The high percentage of improved cases indicates a favourable therapeutic response and clinical efficacy of the treatment administered in the study population. The comparatively lower percentage of nonimproved cases may be attributed to factors such as individual susceptibility, chronicity of the disease, severity of pathology, and variations in response to the prescribed remedy. Overall, the findings suggest that the treatment modality adopted in this study was effective in producing beneficial clinical outcomes in the majority of patients.

STATISTICAL ANALYSIS

T-Test

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 CRPBFORE	44.75	65	43.548	5.401
CRPAFTER	8.305	65	23.7592	2.9470

	N	Correlation	Sig.
Pair 1 CRPBFORE & CRPAFTER	65	.474	.000

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 CRPBFORE - CRPAFTER	36.4492	38.4615	4.7706	26.9189	45.9795	7.640	64	.000

Table 6: PAIRED SAMPLES T-TEST FOR CRP LEVELS (N=65)

Comparison	Mean Difference	St. Error Difference	Z-score	Sig. (p value)	95% Confidence Interval
CRP Before – After	36.449	4.771	7.64	< .001*	[27.10, 45.80]

Table 7: PAIRED SAMPLES Z-TEST FOR CRP LEVELS (N=65)

DISCUSSION:

The results of this study indicate that Belladonna plays a significant therapeutic role in acute inflammatory conditions, which is substantiated by both traditional Homeopathic texts and contemporary experimental data. Classical homeopathic authors including Adolph Lippe, Allen Corson Cowperthwaite, John Henry Clarke, and Todd Hoover consistently identify Belladonna as a key remedy for acute inflammatory states characterized by sudden onset, intense vascular activity, congestion, and pronounced nervous irritability. This remedy is characterized by classical signs of inflammation such as heat, redness, swelling, and throbbing pain, as well as hypersensitivity to light, touch, noise, and movement, reflecting its deep impact on both the vascular and nervous systems, especially the cerebrum.

In this study, objective biochemical evaluation was performed by measuring C-reactive protein (CRP) levels, which were categorized as 0.8–1 mg/dL (normal), 1–2.9 mg/dL (intermediate risk), and >3. mg/dL (indicating a higher risk), with values greater than 10 mg/dL signifying severe inflammation. A notable percentage of patients (86.15%) demonstrated considerable clinical improvement, while 13.85% showed little to no response. The clinical improvement observed aligns closely with the pharmacodynamic characteristics of Belladonna as outlined in Samuel Hahnemann's Organon of Medicine, which highlights the importance of personalized prescribing based on the comprehensive symptoms presented. Belladonna's association with acute, congestive, and inflammatory conditions that have a swift onset supports its efficacy in the current clinical scenario.

Additional classical validation is found in well-established Homeopathic literature such as the Pocket Manual of Homoeopathic Materia Medica by William Boericke, Lectures on Homoeopathic Materia Medica by James Tyler Kent, A Clinical Materia Medica by Clarke, and Guiding Symptoms of Our Materia Medica by Constantine Hering, all of which Belladonna is highlighted as an essential remedy for acute inflammatory and congestive conditions, vascular excitement, throbbing pains, and active arterial congestion, especially impacting the head, glands, skin, and mucous membranes, characterized by intense symptoms and increased sensory sensitivity.

Contemporary experimental research further confirms these clinical findings. Studies on *Atropa belladonna* have shown notable anti-inflammatory effects in experimental models, such as carrageenan-induced paw

oedema, indicating a decrease in oedema development and modulation of acute inflammatory processes. These investigations reported lower levels of proinflammatory substances like prostaglandins, histamine, and cytokines. In particular, Aparna et al. (2023) revealed that Belladonna preparations notably diminished inflammation in induced experimental setups, implying its involvement in regulating vascular permeability and the release of inflammatory mediators. Additionally, in vitro studies suggest possible immunomodulatory effects through the regulation of cytokine expression.

The observed decrease in CRP levels in cases that showed improvement offers objective biochemical proof of Belladonna's anti-inflammatory properties, consistent with both traditional homeopathic concepts and current pharmacological research. The 13.85% of cases that did not respond may be due to factors such as disease chronicity, underlying structural issues, individual sensitivity, lifestyle factors, environmental exposure, and patient adherence. This study supports the effectiveness of Belladonna in treating acute inflammatory disorders, showing strong alignment between traditional homeopathic texts and contemporary experimental studies. Nevertheless, it is advisable to conduct further large-scale randomized controlled trials with enhanced biomarker analysis to confirm and build upon these results.

CONCLUSION:

The present study demonstrates that Belladonna is effective in the management of acute inflammatory conditions. A majority of patients (86.15%) showed significant clinical improvement, along with a reduction in C-reactive protein (CRP) levels, indicating a definite anti-inflammatory effect. The improvement in both clinical symptoms and biochemical parameters suggest its action on underlying inflammatory processes. A small proportion (13.85%) showed minimal or no response. In conclusion, Belladonna is a valuable remedy in acute inflammatory states, and further large-scale controlled studies are recommended to strengthen the evidence base. Structured randomized controlled trials with larger populations and advanced biomarker analysis are recommended to validate and standardize these findings.

ACKNOWLEDGEMENT:

I express my sincere gratitude to Principal and management of Maria Homoeopathic Medical College and Hospital for providing the facilities and a conducive environment to carry out this study. My heartfelt thanks to my respected professor, Dr. Ginu D Mohan, and Dr. Shandic Kumar S, for their invaluable guidance, insightful suggestions, and special thanks to my patient who participated in this study.

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