

# A study of yoga in anemic patients

Neena Sharma, Ritu Gupta

Department of Physiology, Government Medical College, Jammu, Jammu and Kashmir, India  
Correspondence to: Neena Sharma, E-mail: vijay3137@rediffmail.com

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## Abstract

**Background:** Anemia is a clinical condition characterized by reduction in number of red blood cells (RBCs) less than 4 million/mL or their content of hemoglobin less than 12 g/dL or both. Anemia is characterized by general malaise, lassitude, easy fatigability, weakness, tinnitus, exertion dyspnea, and poor concentration. It is a common condition prevalent in our society among men, women, children, and elderly people. The causes of anemia are variable ranging from acute blood loss to chronic blood loss, dietary deficiency, and dyshemopoietic, immune, and hemolytic disorders. Women and children are more prone to anemia. Yoga is a self-discipline method of integrating the body, breath, and mind and attaining one's full potential. The antistress and antioxidant effect of yoga is beneficial in the improvement of hemotological parameters in anemic patients. Yoga increases the circulation of blood and improves the functioning of the entire circulatory system.

**Objective:** To assess the effect of yoga on the hematological parameters among anemic patients.

**Materials and Methods:** This study was conducted on 100 anemic subjects, with 50 men and 50 women, aged between 25 and 40 years. The various hematological parameters studied were hemoglobin, RBC, white blood cell (WBC), and platelet count.

**Result:** The data were analyzed using unpaired *t* test. The study revealed significant increase in hemoglobin ( $p < 0.0001$ ) and RBC ( $p < 0.0001$ ) in both men and women. The WBC count significantly decreased in both men ( $p < 0.0001$ ) and women ( $p < 0.0001$ ). The mean value of platelet count increased in both men and women but was statistically insignificant in men ( $p = 0.3798$ ) and women ( $p = 0.3479$ ).

**Conclusion:** Yoga is a cheap and cost-effective discipline that can be added to the drug therapy for improvement in hematological parameters in anemic patients.

**KEY WORDS:** Anemia, yoga, hematological parameters

## Introduction

Anemia is a common clinical condition affecting all age groups. It is a mild condition that can be appropriately cured but if ignored can lead to fatal condition including heart failure and death. The prominent clinical diagnostic feature of anemia is pallor of skin and palpebral conjunctiva. The decrease in red

blood cell (RBC) counts leads to a decrease in the viscosity of blood, while a decrease in hemoglobin causes decrease in oxygen transport to tissues, leading to tissue hypoxia. Tissue hypoxia leads to decrease in peripheral resistance and compensation by increased cardiac output. Under resting conditions, it hardly produces any affect, but during exercise, heart is unable to supply adequate oxygen to the tissues because it is already pumping at increased strength; hence, severe tissue hypoxia and ischemia result.

Medications and injectables are available for curing anemia but some people have poor compliance to hematinics. Some synergistic therapy must be added to drugs to improve the compliance of drugs and accelerate the improvement in anemia or prevent anemia in healthy individuals.

Yoga is a treasure of physical and mental techniques, which can be effectively used to create physical and mental well-being. With limited information of yoga on RBC count and

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hemoglobin, this study was conducted on the effect of yoga on hematological parameters in anemic subjects.

## Materials and Methods

This study was conducted on 100 anemic subjects, of which 50 were men and 50 women in the age group of 25–40 years. The subjects were selected among anemic patients attending health clinic and among family members, neighbors, friends, and colleagues.

The subjects practiced yoga in the morning between 6 and 7 am in a yoga center in Jammu for treatment. The subjects were investigated for various hematological parameters such as hemoglobin (Hb), RBC counts, white blood cell (WBC) counts, and platelet counts before and after 2 months of yoga exercises.

The hematological parameters were analyzed before and after 2 months of yoga with the help of hemogram by automated cell counter SF-3000.

### Blood Sampling

The blood sample was withdrawn under all aseptic conditions at 8 a.m. before the starting of yoga and analyzed by automated analyzer. The blood sample was again withdrawn after 2 months of yoga and analyzed.

### Yoga program

Yoga program involved the following:

#### 1. Breathing exercises

- Pranayama:** It is the science of proper breathing. It involves slow and deep breath held momentarily in full inspiration within the limits of comfort and slow, and spontaneous exhalation held within the limits of comfort.
- Anuloma viloma:** It is the alternate nostril breathing with breath held to the count of 16 in Vishnu mudra.
- Kapal bharti:** It detoxifies the body of toxins and purifies the blood. It involves short breath with forceful expulsion of breath by contracting the abdomen for 10 min.
- Ujjayi pranayama:** It is loud breathing with closed glottis.
- Suryabhedhi pranayama:** It involves slow and deep inhalation through right nostril and exhalation through left nostril with right nostril closed in padmasana.

**2. Asanas:** Adoption and maintenance of particular posture of body for a set period of time, which is both steady and comparable. The various asanas practiced were *trikonasana*, *sarvangasana*, *paschimottanasana*, and *uttanpadasana*.

**3. Deep relaxation:** It allows the body to absorb all the benefits of *asanas* and breathing exercises. It begins by lying down on back with palms up and legs spread one to two feet

**Table 1:** Hematological parameters of anemic male and female subjects before and after 2 months yoga

Parameters	Before yoga, mean $\pm$ SD	After yoga, mean $\pm$ SD	<i>p</i>
Hb			
Male	9 $\pm$ 1.03	10 $\pm$ 1.03	<0.0001*
Female	8.6 $\pm$ 0.77	9.51 $\pm$ 0.84	<0.0001*
RBC counts			
Male	4.44 $\pm$ 0.29	4.99 $\pm$ 0.28	<0.0001*
Female	3.64 $\pm$ 0.16	4.25 $\pm$ 0.76	<0.0001*
WBC counts			
Male	8641.84 $\pm$ 1167.07	7420 $\pm$ 1074.61	<0.0001*
Female	7196 $\pm$ 837.60	6670 $\pm$ 880.51	0.0004*
Platelet counts			
Male	1.89 $\pm$ 0.52	1.98 $\pm$ 0.50	0.3798
Female	1.84 $\pm$ 0.27	1.89 $\pm$ 0.26	0.3479

\*Significant.

apart. It encourages the release of physical tension and mental stress.

#### 4. Meditation

## Results

The data were analyzed by unpaired *t* test, and *p* < 0.05 was considered significant. Table 1 depicts the changes in hematological parameters of the anemic male and female subjects after 2 months of yoga exercises. In both men and women, the mean value of Hb and RBC count increased after yoga, and the change was statistically highly significant. The mean value of WBC counts decreased after yoga, and the change was again statistically significant. However, although there is an increase in the mean value of platelet counts of in anemic male and female subjects, but the change was statistically insignificant.

## Discussion

Anemia is a considered to be a condition characterized by lack of blood. But medically, anemia can be referred as a condition when the iron content or hemoglobin of blood decreases below the normal level. People with anemia report feelings of fatigue, weakness, general malaise, lack of concentration, and dyspnea on exertion.

Decrease in hemoglobin content of RBC leads to decrease in oxygen carrying capacity of blood, which is compensated by increase in the cardiac output. But during exercise or strenuous work, the heart is unable to pump adequate blood and

anemic patients have symptoms related to this condition such as dyspnea, palpitation, and angina.

This study demonstrated increase in Hb content, RBC, and platelet counts but decrease in WBC counts after yoga practice.

Our study is analogous to study conducted by Purohit et al.<sup>[1]</sup> who reported increase in platelet counts. A similar study was carried out by Chohan et al.,<sup>[2]</sup> which supports our study on the effect of yoga on platelet counts.

Our study correlates with the study conducted by Sharma et al.,<sup>[3]</sup> who also reported improvement in hemoglobin counts and WBC counts after yoga.

A similar study by Mehmot<sup>[4]</sup> reported improvement in hemotological parameters after yoga. The increase in RBC counts and platelet counts can be emphasized by the hypoxia induced during yoga, which leads to erythropoiesis and thrombopoiesis.

Yoga is a holistic mind–body intervention aimed at physical, mental, emotional, and spiritual well-being. Yoga begins by working with body on a structural level. The yogic practices stimulate and balance all systems of the body resulting in mental clarity, emotional stability, and a sense of overall well-being.

Only a month of yoga practice causes sense of body–mind equilibrium, feeling of energetic light heartedness, feeling of relaxation, and dissolve emotional blanks, which can obstruct flow of vital energy within the body. Breathing exercises increase the flow of vital energy to various organs in our body and strengthen the voluntary and autonomic nervous system.

Yoga asanas cover the entire human anatomy from top of the head to the tips of toes, correct the systemic irregularities, and maintain the entire physiology in peak condition.

Deep relaxation techniques help to recoup the energy and absorb all the benefits of asanas and breathing exercises. Relaxation practices in yoga are different than sleeping when properly done and help to develop confidence and stabilize the minds awareness in a pool of deep tranquility and peace. Deep relaxation can become a powerful meditation practice.

A combination of asanas, breathing exercises, relaxation techniques, and meditation practiced for a month or more triggers neurohormonal mechanisms in the form of stable autonomic nervous system equilibrium with a tendency toward parasympathetic nervous system dominance. The relaxed state of mind during relaxation techniques and meditation contributes to the antistress and antioxidant effects of yoga resulting in the improvement in hemoglobin, RBC, and platelet counts with a decrease in WBC counts.

The strength of the study is that it is a short-term study conducted on both the sexes to comment on the health benefits of yoga on hematological parameters.

## Limitations

The study can be carried out exclusively on female subjects with a large sample size and for a longer period as they have less RBC count and more prone to anemia. Children also practice yoga as exercise in schools and sports club. So, the study should be extended to children to comment on the health benefits of yoga in children.

Yoga contributes to the preventive aspects of medical science. The improvement in hemotological parameters caused by yoga can benefit healthy individuals, anemic patients, and patients with dyshemopoiesis.

Yoga can be added to drug therapy to accelerate the improvement in hematological parameters in anemic patients and dyshemopoiesis. It can also prevent anemia in young healthy individuals who are predisposed to anemia as a result of acute hemorrhage, worms, excess menstruation, piles, and peptic ulcer.

This short-term study demonstrated that yoga therapy causes improvement in hematological parameters and helps efficiently in reducing the symptoms of anemia.

## Conclusion

Yogic practice can affect the body from the cellular level and causes improvement in hematological parameters with least expenditure.

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