WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Review on New Emerging Way To Treat Anemia By Using Turtle's Blood

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A B S T R A C T :

Anemia is a condition in which the blood doesn't have enough healthy red blood cells. Anemia result from a lack of red blood cells or dysfunctional red blood cell in the body. Presently the various treatment available for anemia such as Dietary supplements, VitaminB12, Folic acid supplements, blood transfusion, bone marrow transplants and oxygen therapy. But by using turtle blood has been studied for its potential therapeutic properties, particularly in the treatment of anemia. Rich in essential nutrients, including iron and proteins, it may enhance hemoglobin levels and improve oxygen transport in the body. Research indicates that compounds found in turtle blood can stimulate erythropoiesis, the production of red blood cells, thus providing a natural alternative for managing anemia. This abstract explores the biochemical components of turtle blood, its traditional uses in various cultures, and the emerging scientific evidence supporting its efficacy as an adjunct therapy for anemia.

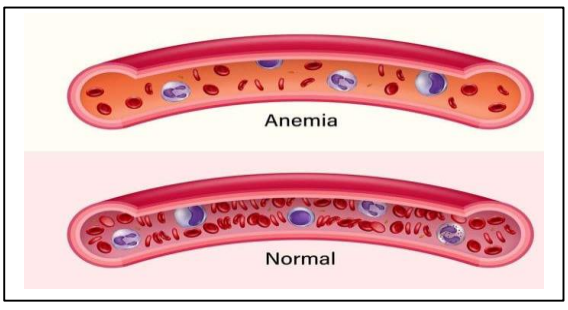
Keywords: Anemia, erythropoiesis, turtle blood, RBC, supplements

1.Introduction

Turtles are easily recognizable to most people thanks to their shells. These are amazing, unique structures that wrap the animal's whole body in a bone casing that only opens in the front and back. Naturally, its shell helps to shield them from natural adversaries, but it has also restricted their morphological diversity. While there are aquatic and terrestrial turtles, no arboreal or avian turtles can climb or fly.[1]

Fig. 1: Eastern Box Turtle (Terrapene Carolina Carolina)

Anemia is characterized by a reduction in the number of circulating red blood cells. When this occurs, the blood is unable to give adequate oxygen to the body. A person with anemia may feel fatigued or weak. According to reputable sources, around 3 million people in the United States suffer some kind of anemia. Other health issues, such as those that interfere with the body's creation of healthy red blood cells (RBCs) or speed up the breakdown or loss of these cells, can result in anemia. Anemia can cause weariness, shortness of breath, and light-headedness.(2)



The most common symptom of anemia is fatigue. Other common symptoms include:

- pallid complexion, a fast or irregular heartbeat, shortness of breath, chest pain, headache, light-headedness.
- However, symptoms vary from person to person. Some people with mild anemia may experience few or no symptoms.

Turtle Body Parts & Their Functions

In Togo, individuals use powdered bones and skulls to alleviate pain. When the powdered skull is mixed with python fat, it forms an ointment that cures chest discomfort. Broken and crushed carapaces are blended with lemon juice, honey, or the medicinal plant Fagara zanthoxyloides to create Senegalese prickly ash. These various mixtures are used to treat cardiac arrhythmias, headaches, and asthma.

Togolese coastal communities believe that sea turtle bones are advantageous to a child's skeletal and muscular development. As a result, some moms regularly add turtle bones to their baby's bath water. It is believed that doing so will expose the newborn to the power of turtles, particularly leatherbacks, on the nesting beach.[3]

Turtle blood has been studied for its potential to treat anemia due to its unique properties:

1. High iron content: Turtle blood contains high levels of iron, essential for producing hemoglobin and treating anemia.
2. Antioxidant properties: Turtle blood has antioxidant properties, which help protect against oxidative stress and cell damage.
3. Different iron metabolism: Other reptiles and animals may have different iron metabolism pathways, making their blood less effective for treating anemia.
4. Lower antioxidant levels: Other animals may not have the same level of antioxidants as turtles, reducing their blood's protective effects.
5. Incompatible blood chemistry: The blood chemistry of other animals may not be compatible with human blood, leading to adverse reactions or reduced efficacy.
6. Risk of disease transmission: Using blood from other animals can pose a risk of disease transmission, making turtle blood a potentially safer option.

In turtles and tortoises, the jugular vein is the preferable location for blood collection, fluid treatment, or catheter placement [4], although chelonians' thick skin can make it difficult to view and catheterize the vein. Furthermore, this issue may worsen if there is inadequate peripheral perfusion or oedema.[5] Various methods have been employed to improve the identification of the vessel, such as ultrasound,[5], or more invasive operations such as jugular cutdown.[33]. Martinez- Jimenez and Hernandez Divers. An easy approach is to inject a light source via the oral cavity into the esophagus, allowing the jugular vein to be seen clearly through the skin. The animal is positioned in lateral recumbency, and an otoscope is inserted and pointed toward the vessel on the lateral aspect of the neck. Reptile veterinarians work with hundreds of distinct chelonian species with varying anatomical features, which means that the light source must be shifted lateral and medial in each individual animal until the exact anatomical position of the vein is determined. Take care not to push on the esophagus, which might cause the vessel to collapse.[6]

FIG 5: JUGULAR VEIN

Materials And Method:

Introduction Of Eastern Box Turtle:

- The eastern box turtle (*Terrapene carolina carolina*) is subspecies within a group of hinges - shelled turtles normally called box turtles *T.c carolina* is native to the Eastern United State
- Box turtles are slow crawlers, extremely long-lived, and slow to mature and have relatively few offspring per year.
- The eastern box turtle is considered uncommon to rare in the green lake region; however, populations can be found in areas not bisected by heavily traveled roads

- The eastern box turtle is considered uncommon to rare in the green lake region; however, populations can be found in areas not bisected by heavily traveled roads
- They have been known to stay at the same site for upwards of 32 years, which is highly uncommon for reptiles and will rarely travel more than 1.5 miles (2.5 km) from their home territory.[7]

Table No 1: Scientific Classification

Domain:	Eukaryota
Kingdom	Animalia
Phylum	Chordata
Class	Reptilia
Order	Testudines
Suborder	Cryptodira
Superfamily	Testudinoidea
Family	Emydidae
Genus	Terrapene
Species	T. Carolina

Blood Collection

- We sampled turtles of the species EASTERN BOX TURTLES (Terrapene Carolina Carolina). The turtles were conditioned to an average artificial ambient temperature of 30˚c.
- In all cases, non- anticoagulant syringes coupled to 25-gauge needles one inch in length were used.
- Each point was previously disinfected using chlorhexidine. The volume of blood taken was calculated from the individual's weight and did not exceed 1% of the weight/volume ratio (w/v) of each animal.
- Once the sample was obtained, moderate pressure was applied to the venipuncture sites to avoid bruising. The venipuncture points evaluated are listed below.[6]
- The jugular vein is found through the neck of the animal in an anteroposterior position, at the level of the eardrum [37] The needle should be inserted superficially, parallel to the neck in a caudal direction.[7]

Jugular Vein:

- The jugular vein lies laterally and superficially on the neck. Jugular venipuncture should be attempted first as this sample is least likely to be diluted with lymph.
- A 5/8-inch 23-24gauge needle and the smallest syringe possible should be used.

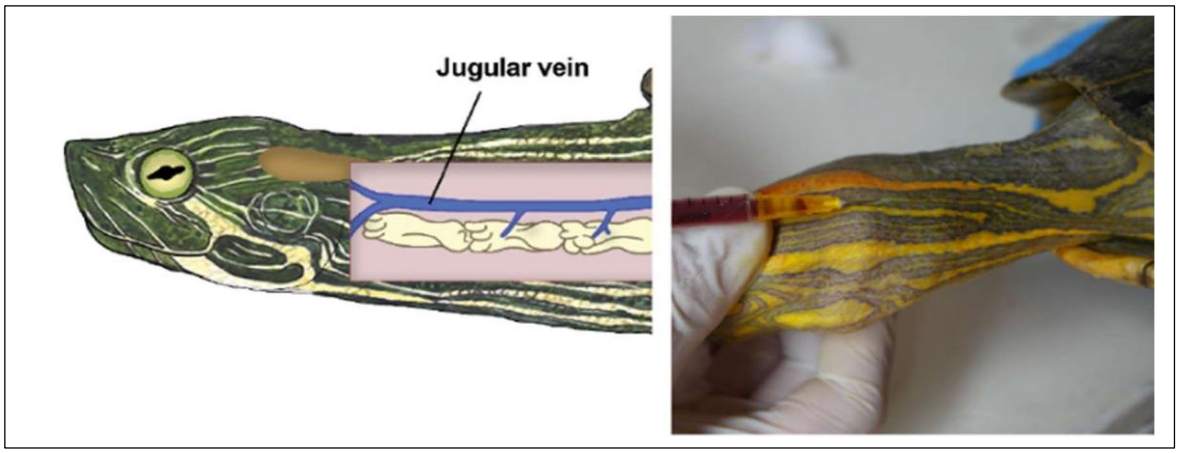


FIG 6: METHODOLOGY

- Due to the turtles' retraction of their head and the strength they apply to do this, access to this vein was difficult, particularly in those of the Cryptodira suborder. However, once the head was controlled, the vein was easily observable and palpable. Blood samples obtained from this site usually had good quality.
- They were rarely diluted with lymph, as evidenced after the RBC and the hemoglobin concentration analysis. The values obtained from this point of venipuncture were significantly higher than those of the other sit
- The jugular vein showed good blood how and was easy to localize but favored the formation of bruises. To avoid this, it was necessary to apply moderate pressure at the puncture point for about two minutes after blood extraction.

- Data behave normally, we performed an ANOVA test to compare the variables measured against the different sampled sites. ANOVA test showed a significantly difference between the puncture sites evaluated ($p<0.01$).[8]

Blood S/Ample Storage:

Despite having used syringes without anticoagulant during the procedure, there was no evidence of rapid coagulation of the samples that allowed the sample to be divided a posteriori into different containers, either in microtubes with serum separation gel (for biochemical analysis) or vials with EDTA or sodium heparin (for hematological analysis)

Mechanism Action:

Turtle blood consumption

⬇

Iron from turtle blood absorbed in body Increased iron

⬇

availability in blood stream Enhanced hemoglobulin

⬇

synthesis Improved red blood cells production Increased

⬇

oxygen carrying capacity Reduction in anemia symptoms

⬇

Conclusion:

In this conclusion this study demonstrates the potential of turtle blood derived compounds as a novel therapeutic approach for treating anemia in human beings. The antioxidants, immunomodulatory, and erythropoietin-like properties of turtle blood show promise in enhancing red blood cell production, reducing oxidative stress, and mitigating inflammation, reducing anemia in human beings.

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