

A Note on Hemostatis

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INTRODUCTION

Haemostasis is very important mechanism of our body as it prevents from hemorrhage. Without this mechanism the survival of person is not possible. This system in our body represents a very delicate balance between pro-coagulant, anticoagulant allied to a method of fibrinolysis. This system consists of 5 major components in our body i.e. platelets, coagulation factors, coagulation inhibitors, fibrinolysis and blood vessels. [1]. many problems can arise in this system so these problems can be cured by a variety of medicinal plants and mushrooms. This system is controlled by thromboxane synthase (TXS), which converts prostaglandin H₂ into thromboxane A₂, a potent vasoconstrictor and platelet aggregator. Plasminogen activator inhibitor type 1 (PAI-1) also plays a role in haemostasis by inhibition of fibrinolysis, which prevents failure of this process. Subsequently, neutrophils release free radicals to kill bacteria the inflammation phase and heme. The heme proteins also accumulate at the local site of the wound.

This heme and heme proteins have prooxidative and proinflammatory properties by inducing the expression of adhesion molecules, causing vascular permeability and leukocyte infiltration. These actions initiate wound healing process. Heme oxygenase-1 (HO-1) has anti-inflammatory and antioxidant activities. It is also responsible for a wide range of wound healing functions. It converts heme into biliverdin/bilirubin, iron and carbon monoxide, which are potent antioxidant products. The overexpression of HO-1 helps to accelerate wound healing such as amelioration of inflammation, proliferation and protection against endothelial cell apoptosis.

Matrix metalloproteinases (MMPs) also play a major role in wound healing by extracellular matrix (ECM) remodelling, and MMP-9 is key effector among those. [2]. There are three main steps involved in haemostatic mechanism which are as follows: -

1) Vasoconstriction :- There is a vascular spasms felt when any tissue is damaged which triggers vasoconstriction and the blood flow will stop gradually. Collagen fibres release ATP and many inflammatory mediators which can recruit macrophages. After this in the damages surfaces platelets plug formation occur in which there is adhesion, activation and aggregation which together form platelet plug [3].

2) Platelet plug formation: - It involves three steps: -

a) Platelet adhesion: - First initial step in the haemostatic in which platelets adhere to the exposed site i.e. sub endothelium which is mediated by Von Willebrand factor

b) Platelet Activation: - Variety of stimuli activate platelets. They are also activated by. biomaterial surface stimulation. There are various receptors involved in platelet activation.

c) Platelet aggregation: - This process happens once the platelets are activated. At last the platelet plug is formed which is stabilized once the fibrin is formed.

1) Clot Formation: - This process involves a series of factors which together are involved in forming a clot. These series are known as coagulation cascade [4].

Presence of bioactive compounds: - For the proper functioning of haemostatic mechanism there are various active compounds present naturally in medicinal plants and mushrooms as well. Many studies have indicated that the role of bioactive compounds is very important in wound healing like tannins are considered to be detoxifying agents and can inhibit bacterial infection, terpenoids contain astringent and antimicrobial properties which can promote wound healing process, flavonoids have antioxidant property as well as are free radical scavengers, glycosides contain antioxidant, antimicrobial, analgesic, anti-tumour, immunomodulatory and anti-inflammatory properties. [5]

It was found out in one more research paper that tannins help in limiting the fluid loss and regenerate the tissue when there are wounds or burns on the skin by using them orally. They act as a vasoprotective. In *Aspilia africana* also alkaloids, saponins, sterols, terpenoids, carbohydrates, glycosides and tannins are found and these metabolites are responsible for pharmacological activities which can be used. Pinene is one of the terpenoids in this plant that have anti-inflammatory properties and help in wound healing process. The bioactive compounds have exerted haemostatic activity which contain tannins, iridoid, glycosides, glycoconjugate, lignan, saponins and various phenolic compounds. [5].

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REFERENCES

1. Okoli CO, Akah PA, Okoli AS. Potentials of leaves of *Aspilia africana* (Compositae) in wound care: an experimental evaluation. *BMC Complementary and Alternative Medicine*. 2007 (1):24.
2. Demilew W, Adinew GM, Asrade S. Evaluation of the wound healing activity of the crude extract of leaves of *Acanthus polystachyus* Delile (Acanthaceae). *Evidence-Based Complementary and Alternative Medicine*. 2018.
3. Bamidele O, Akinnuga AM, Anyakudo MM, Ojo OA, Ojo GB, Olorunfemi JO. Haemostatic effect of methanolic leaf extract of *Ageratum conyzoides* in albino rats. *Journal of Medicinal Plants Research*. 2010;4(20):2075-2079.
4. Yacouba DL, Issa S, Adiaratou T, Yacouba C, Ibrahim DB, Sidiki TA, et al. Biochemical and Hemostatic properties of herbal plants used for the treatment of bleeding in Mali. *Acad. J. Med. Plants*. 2018 6(8): 241-248.
5. Tanko Y, Eze ED, Jimoh A, Yusof K, Mohammed KA, Balarabe F, Mohammed A. Haemostatic effect of aqueous extract of mushroom (*Ganoderma lucidum*). *Pelagia Research Library*. 2012;2(6):2015-2018