

**A COMPREHENSIVE STUDY OF ROLE OF AMALAKI (EMBLICA OFFICINALIS) IN THE MANAGEMENT OF RAKTAPITTA W.S.R. TO THROMBOCYTOPENIA**<sup>1</sup>\*Dr. Amruta A. Jagtap and <sup>2</sup>Dr. Vijay G. Patrikar<sup>1</sup>Ph. D Scholar, Dept. of Swasthavritta and Yoga, Government Ayurveda College, Nagpur, Maharashtra, India.<sup>2</sup>Ph. D Guide, Dept. of Swasthavritta and Yoga, Government Ayurveda College, Nagpur, Maharashtra, India.**\*Corresponding Author: Dr. Amruta A. Jagtap**

Ph. D Scholar, Dept. of Swasthavritta and Yoga, Government Ayurveda College, Nagpur, Maharashtra, India.

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**ABSTRACT**

Thrombocytopenia is clinically defined as a condition in which platelet count is less than 150,000/  $\mu$  L. Various reasons are responsible for the condition like decreased platelet production, increased destruction or sequestration of the platelets. The clinical expression of Thrombocytopenia has broad variation from asymptomatic to life threatening bleeding. Multifarious researches in different streams of science are done, to understand and to counter Thrombocytopenia. Ayurveda has thrown light on various aspects of pathogenesis, symptomatology and treatment of this ailment. Amalaki is the most revered medicine in Ayurveda. Every Samhita has mentioned its benefits in variety of ailments. This article is an attempt to critically study Amalaki's usefulness in Raktapitta; a condition which can be compared with Thrombocytopenia. The probable mode of action of Amalaki in the management of Thrombocytopenia is postulated according to the actions of its constituents and theories explained in Ayurveda.

**KEYWORDS:** Thrombocytopenia, Amalaki, Platelets, Thrombopoietic activity, Raktapitta, Emblica Officinalis, Blood disorder.

**INTRODUCTION**

Thrombocytopenia is one of the most common hematologic disorders. Thrombocytopenia is defined as a platelet count less than  $150 \times 10^3$  per  $\mu$  L. In adults, thrombocytopenia is a condition when platelet count is less than  $150 \times 10^3$  per  $\mu$  L. It is termed mild if counts are in the range of 70 to  $150 \times 10^3$  per  $\mu$  L and severe if counts are less than  $20 \times 10^3$ .<sup>[1]</sup> Patients with a platelet count more than  $50 \times 10^3$  per  $\mu$  L often remain asymptomatic. Individuals with count between 30 to  $50 \times 10^3$  per  $\mu$  L sporadically present with purpura, although these individuals may have excessive bleeding with trauma. Patients with counts between 10 to  $30 \times 10^3$  per  $\mu$  L may cause bleeding with minor trauma and counts less than  $10 \times 10^3$  per  $\mu$  L multiplies the risk of spontaneous bleeding, bruising and petechiae. Patients with platelet counts less than  $5 \times 10^3$  per  $\mu$  L is considered a hematologic emergency; with gastrointestinal, genitourinary, mucosal, intracranial bleeding.<sup>[2]</sup> The risk of venous thrombo embolism is twice as high among patients suffering from ITP in comparison with the general population.<sup>[3,4]</sup> The pathophysiology of ITP is complex and it is not completely understood. It is assumed that antibody coated platelets are prematurely destroyed in Liver, Spleen or both via interaction with Fc $\gamma$  receptors.<sup>[4]</sup> Autoantibodies may also initiate complement mediated desialylation induced destruction of platelets.<sup>[5,6]</sup>

Ayurveda has mentioned Raktapitta as a disorder where the vitiated blood (Rakta) gets mixed with vitiated Pitta and oozes out through various orifices of the body.<sup>[7]</sup> It is regarded as one of the Mahagada by Acharya Charaka.<sup>[8]</sup> Raktapitta is incorporated in fourty Nanatmaja vyadhi of Pitta Dosh. Raktapitta is classified into three types according to the derangement of doshas involved and orifices through which vitiated Rakta oozes out. On the basis of degree of involvement of vitiated doshas; Raktapitta is divided into four types; viz; Pittaja Raktapitta, Kaphaja Raktapitta, Sannipataja Raktapitta and samsargaja Raktapitta.<sup>[9]</sup>

On the basis of direction of bleeding Raktapitta is classified into three types. They are, Urdhvaga Raktapitta, Adhoga Raktapitta and Ubhaya or Tiryak Raktapitta.<sup>[10]</sup>

Ayurvedic Literature has mentioned numerous medicinal plants for the well-being of humans and treatment of ailments. Some herbs are revered since they exhibit humungous benefits. Amalaki is arguably the most important and researched herb in Ayurvedic Samhitas. The literal meaning of Amalaki is sustainer or the fruit where the goddess of prosperity resides. All the samhitas mentions Amalaki as the best Rasayana for humans. Apart from being a Rasayana medicine, Amalaki is used in treating various anomalies.

Sushruta Samhita, Bhavprakash Nighantu, Raj Nighantu mentions Amalaki as Raktapittahara (Thrombopoietic) medicine.<sup>[11,12,13]</sup>

Amalaki on chemical analysis contains phenolic compounds, amino acids, carbohydrates, tannins and alkaloids. The fruit of Amalaki contains highest level of Vitamin C (478.56 mg/100 ml).<sup>[14]</sup>

Many other beneficial compounds such as quercetin, ellagic acid, ellagitannins (embicanin A, emblicanin B, Punigluconin, Pedunculagin), Punicafolin, Polyphenols (flavonoids, Kaempferol, gallic acid), 1,6-di-o-galloyl beta-D glucose, 3,6-di-o-galloyl-glucose, 3 ethylgallic acid, 1-0-galloyl-beta-D-glucose; etc. are found in Amalaki.<sup>[15]</sup>

### PROBABLE MODE OF ACTION OF AMALAKI IN RAKTAPITTA

In Indian Subcontinent, Amalaki has been used for various medicinal purposes for centuries like, Jaundice, Rheumatic fever, Asthama, Gonorrhoea, Dyspepsia, Nausea, Haemorrhage, Eye diseases, Heart disorders, ailments of alimentary canal, coronary heart diseases, Diabetes mellitus and various types of cancers.<sup>[16,17]</sup>

Recent studies have proved that Amalaki exhibit anti-inflammatory, hypoglycemic, anti-hyperglycaemic, antihyperlipidemic and antioxidant properties in animal as well as human studies.<sup>[18,19,20]</sup> These properties are because of the presence of high amounts of vitamin C, tannins, polyphenols, fibres, proteins, amino acids and minerals.<sup>[16,21]</sup>

Amalaki formulations contains ellagitannins like geraniin, chebulagic acid, carilagin, elaeocarpusin, etc., which are the most active components that possesses high antioxidant activity.<sup>[21]</sup> Pedunculagin is an ellagitannin, a group of Polyphenolic hydrolyzable tannins, found in Amalaki. It exhibits anti-inflammatory, anti-microbial and anti-cancer activities.<sup>[22]</sup>

In most of the ITP cases antibodies are detected against the platelets.<sup>[23]</sup> Many of these antibodies demonstrate actions against platelet membrane glycoproteins IIb - IIIa or Ib-IX and are of the IgG type.<sup>[24]</sup> The platelet membrane gets coated with IgG type antibodies. The coating of platelets with IgG proffers these platelets vulnerable to opsonization and phagocytosis by kuffer cells present in liver and splenic macrophages. The IgG autoantibodies even damage the megakaryocytes, the precursor cells to platelets. Body's immune system erroneously identifies platelets as foreign invaders and produces antibodies to attack them. These antibodies get attached to platelets which marks them and these platelets are destructed by spleen and liver.<sup>[25]</sup>

The high antioxidant property of Amalaki, due to the presence of ellagitannin, high amount of vitamin c,

polyphenols, amino acids and minerals, works fantastically well against these anti bodies.

Amalaki is one of the herbs which contains the highest amount of vitamin c.<sup>[14]</sup> Vitamin C helps platelets to group together and function efficiently. Vitamin c helps in the process of absorption of iron, which helps to increase the platelet count.<sup>[26]</sup> Vitamin C is a key modulator of platelet function. Platelets store high intracellular concentrations of Vitamin C, which then modify its oxidative state and play a role in its ability to aggregate.

Thrombocytopenia is reported to be associated with iron deficiency anemia.<sup>[28,29,30]</sup> The basic principle of addressing the treatment of anemia involves plenishing deficiencies of iron, vitamin B12 and folic acid. In this perspective Amalaki is exceedingly useful due to its rich reservoir of vitamin c. Vitamin c is the only dietary component other than animal tissue which has shown to promote iron absorption.<sup>[31,32]</sup>

Primarily iron absorption happens in the duodenum and upper part of jejunum, where ferrous iron is transported into small intestine. When iron is consumed orally it is always oxidized to the Fe 3+ state. It requires an acidic gastrointestinal environment to be dissolved adequately for absorption. Vitamin C forms more acidic environment in the stomach, thus prevents oxidation of ferrous iron to ferric iron.<sup>[33]</sup>

### CONCLUSION

Amalaki is indisputably the most venerated plant in Ayurvedic Literature. It is worshiped for its comprehensive medicinal properties. This article, is an effort to establish Amalaki's effectiveness in the management of Raktapitta, w.s.r. to, Thrombocytopenia. After critically studying various research articles and books; probable mode of action can be concluded the following way. Amalaki is a power house of many vital polyphenols, tannins, amino acids and vitamin c. These constituents make Amalaki a potent antioxidant. This antioxidant property rescinds the antibodies which exhibit actions against platelet membrane making them vulnerable to opsonization and phagocytosis by kuffer cells in liver and splenic macrophages. The vitamin C succour platelets to group together and function proficiently. Vitamin C is of paramount importance for absorption of iron, which helps to increase the platelet Count.

It is the antioxidant property of Amalaki and presence of high amount of vitamin c, makes it a very effective medicine in Raktapitta (Thrombocytopenia).

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