IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

CRITICAL REVIEW ON CLINICAL VALIDATION OF KESHYA PROPERTY OF GOMUTRA SHILAJITH & GUNJA BEEJA CHURNA IN KHALITYA W.S.R TO ANDROGEN ALOPECIA

Ramya Pala, Kovi Sreehari

BAMS, PROFESSOR & HOD of RASA SATRA& BHAISHAJYA KALPANA

Dr.NTR UNIVERSITY OF HEALTH SCIENCES

Abstract:

Hair plays a major role in physical appearance & it also mirrors the healthy state of a body. AGA is silent devastating problem in these days. Although there are many classical formulations done by ayurvedic physicians, there is a lack of data regarding the pattern of hair cycles, how they got effected in androgen alopecia and treatment according to stages involved.

Vagbhata opined that Asthidhatu kshaya leads to keshashata lakshanas as keshya,nakha,lomas are said to be as upadhatus , Gomutra Shilajith, having indirect effect on hair having Rasayana property and Gunja beeja Churna helps in regeneration of hair follicle. This review is an attempt to explain the aspects of Correlation of Androgen Alopecia w.s.r to khalitya, Asthidhatu kshaya leads to kesasata lakshana and its modern correlation and the role of Gomutra Shilajith and Gunja beeja churna in Androgen alopecia.

Introduction:

Anatomy of hair follicles – Hair follicles are microscopic, tube like structures containing hair. They are made up of

Hair bulb – The rounded base of the hair root, where new hair cells produced.

Hair papillae – Supplies root hair with blood, contains germinating cells undergoing mitosis.

Sebaceous glands – Produces oily secretion that conditions the hair and skin.

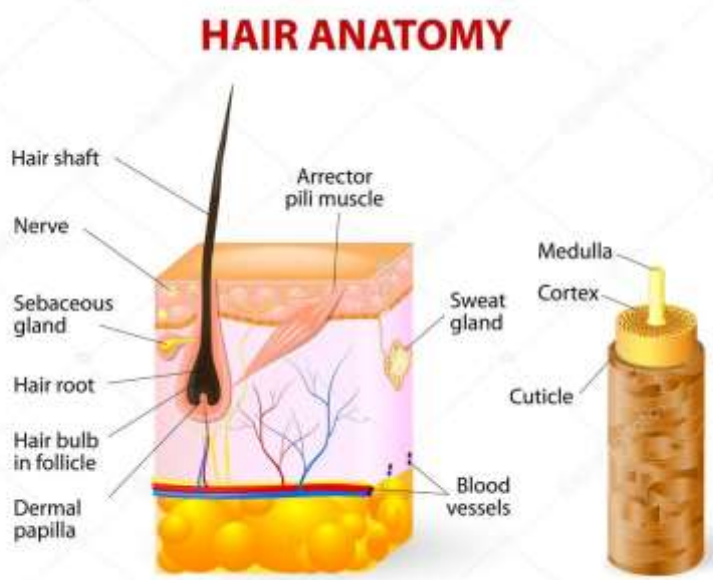
Arrector pili muscle – A tiny muscle that attaches to hair and makes hair stand up.

Layers of hair follicle –

Medulla – Maintains the diameter of hair follicle.

Cortex – Maintaining the tensile strength through its di-sulphide bonds.

Cuticle – Acts as protective sheath and as physico-chemical barrier.



Normal hair cycle –

Hair formation is a cyclic phenomenon. There are successive periods of growth, involution and rest of hair follicle. The part of the hair follicle below the attachment of arrector pili muscle disappears and appears periodically. There are three main stages in hair cycle – *Anagen, Catagen, Telogen* and other involved *Exogen* and *Kenogen* also

Anagen –

- It is the period of *active hair growth*, 80-90% hair involved.
- It will last for 6 months to 10 years, determining the length of hair follicle. There is growth of dermal papillae and overlying gem like epithelium shows mitotic activity.
- The lower part of papillae along with matrix moves downwards and gets invaginated by hair papillae forming hair bulb and the matrix cells undergo proliferative activity, melanocytes reactivated forming new hair shaft and dislodges the old club hair.

Catagen –

- It is a passive process of *mitotic exhaustion*, 1% hair involved.
- The hair matrix stops proliferating and apoptosis starts at various levels of follicles.
- Melanocytes stops producing melanin and its transfer to keratinocytes.

- Club hair forms and it retracted away from papillae.

Telogen –

- It is the period of complete follicular regression, and it is the resting phase of the hair cycle, 10% of hair involved.
- Telogen hairs are depigmented, short, lack of root sheath, the root end is club shaped.
- The club hair shrinks, moves upwards to the point where arrector pili muscle inserts.

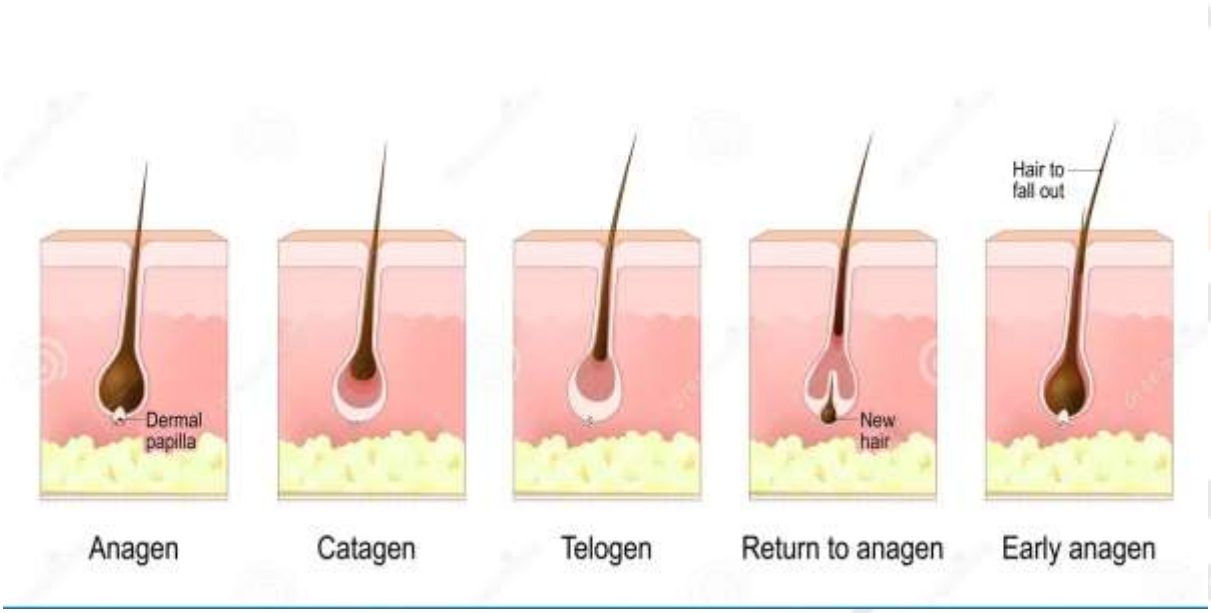
Exogen –

- It is the active phase of hair shedding phenomenon.

❖ The defect in exogen leads to Tricho-stasis-spinulosa.

Kenogen –

- It is an off shoot from telogen where hair follicle is empty following hair shedding.
- It can be seen in AGA. The duration of kenogen and number of kenogens is directly proportional to AGA.



AGA and its effects on hair cycle –

❖ Generally, the Testosterone converts to DHT in the presence of 5α-reductase and this DHT plays a major role in maintaining the texture and lubricity of hair.

❖ AGA is a patterned progressive hair loss which occurs in genetically predisposed individuals when exposed to androgens

❖ It is due to the conversion of susceptible terminal to vellus hairs on androgen mediation.

❖ All hairs are not equally affected by androgens. After puberty scalp hair is lost, there is growth of body hair and eyebrow hair is not affected.

❖ Even on the scalp, the frontal, temporal, and vertex hair are lost, whereas the occipital hair remains intact. In men, the circulating androgens are more than the requirement of hair follicles; therefore, the local factors determine the predisposition and the severity of AGA.

❖ In females, since the androgen levels are not high, both the genetic predisposition and androgen levels determine the development and intensity.

❖ The hair shows donor dominance, therefore hair transplanted from occipital area to the vertex is resistant to AGA and vertex hair when transplanted to forearm miniaturizes.

❖ Dermal papillae is a group of specialized fibroblasts which regulates the activity & growth of cells in the hair follicle signals from dermal papillae reach the multipotent epidermal cells situated in hair bulge region causing hair regeneration & proper follicular activity.

❖ Under the influence of androgens, there is a signal between dermal papillae and the hair follicles causes secretion of CATAGEN promoting factors.

❖ These factors including cytokines such as interleukin-1- α, TNF-α, TGF-β etc .these are having ***Paracrine action*** on hair follicles and ***Autocrine action*** on dermal papillae.

❖ Decreased expression of anagen promoting factors, and increased cytokines promotes apoptosis of hair follicles leading to catagen.

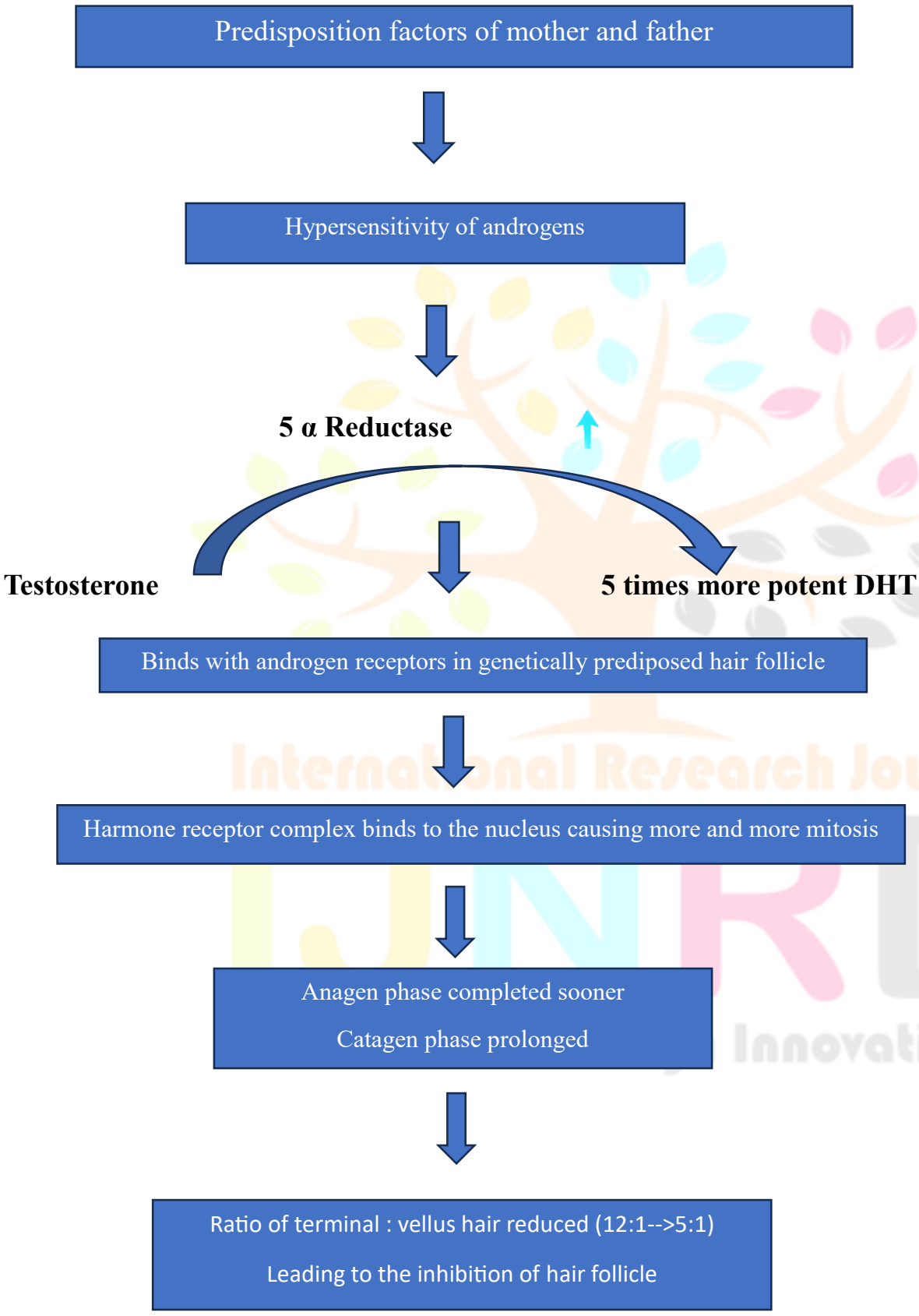
❖ DHT causes upregulation of DKK-1 gene leading to inhibition of outer root sheath cells leading to apoptosis.

❖ Wnt / β catenin signalling pathway plays a critical role in maintenance of dermal papillae cell induction for hair shaft growth and follicle regeneration. Androgens inhibit this pathway by increasing glycogen synthase kinase expression.

❖ For proper follicular activity, hair follicle stem cells need to be converted to CD34-positiveand CD200-rich progenitor. In AGA, there is a defect in this conversion.

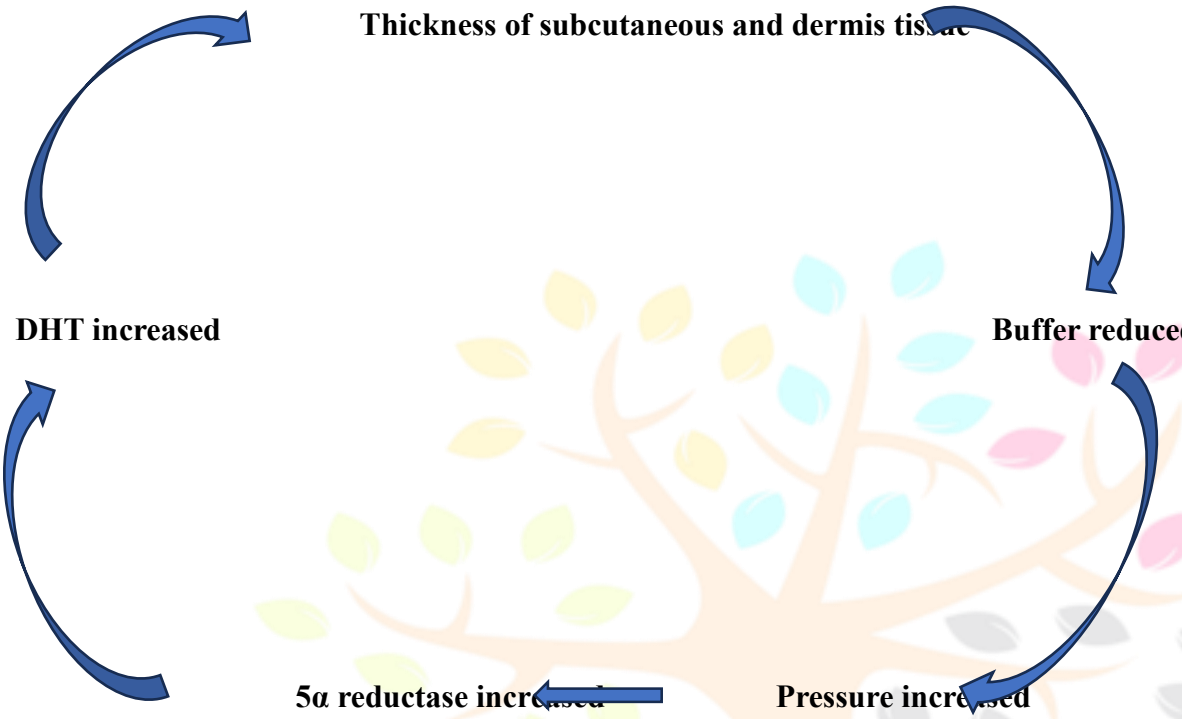
Pathophysiology of AGA and its effect on hair cycle –

1st concept



2nd concept

Pressure on hair follicles buffers by subcutaneous tissue and dermis. In AGA the thickness of subcutaneous and dermis reduced due to high DHT levels.



How AGA effects hair follicle anatomically –

- Diameter of medulla reduced causing thin hair follicle.
- Sparsity of papillary cells.
- Sebaceous gland secretion increases leading to blockage of hair follicle to regrow.

Correlation to Khalitya –

Khalitya is a tridoshajavyadhi in which

- Pitta↑↑ (DHT) + Combines with Vata (PRESSURE) ⟶ getting into pores causing hairfall
- Kapha (↑Sebum) + Rakta (↑serum DHEA) ⟶ causes obstruction& prevents of Regrowth of hair follicles
- According to Vagbhata, kesha is a mala of Asthidhatu and Asthidhatu kshaya leads to keshashata lakshana.

Modern correlation of Asthidhatu kshaya leads to keshasata lakshanas –

❖ According to acharyas, Asthidhatu kshaya leads to khalitya. In support of this, in modern concept both bone and adipose tissue are having the same origin i.e., ***mesenchymal stem cells***.

❖ According to Dhatuposhan Nyaya, the origin of Asthidhatu takes place on account of specific action of Asthidhatvagni and Asthiposhakamsh which is form during ***Medodhatu Utpatti.***

❖ Here, Meda can be taken as fat/adipose tissue. Mesenchymal stem cells in which adipose tissue is form plays a crucial role in hair growth by acting as signalling hubs, stimulates hair follicle specifically in dermal papillae and dermal sheath.

❖ Mesenchymal stem cells include Fibroblast Growth Factor (FGF), Vascular Endothelial Growth Factor (VEGF) and Wnt proteins that stimulates hair growth.

❖ Adipose tissue serves as a cushion for pressure buffer as it resides beneath the subcutaneous tissue, hormonal secretion, insulin sensitivity, reservoir of stem cells.

❖ Given the link between mesenchymal stem cells with Asthi Dhati vardhana, this makes sense.

Plan of Management –

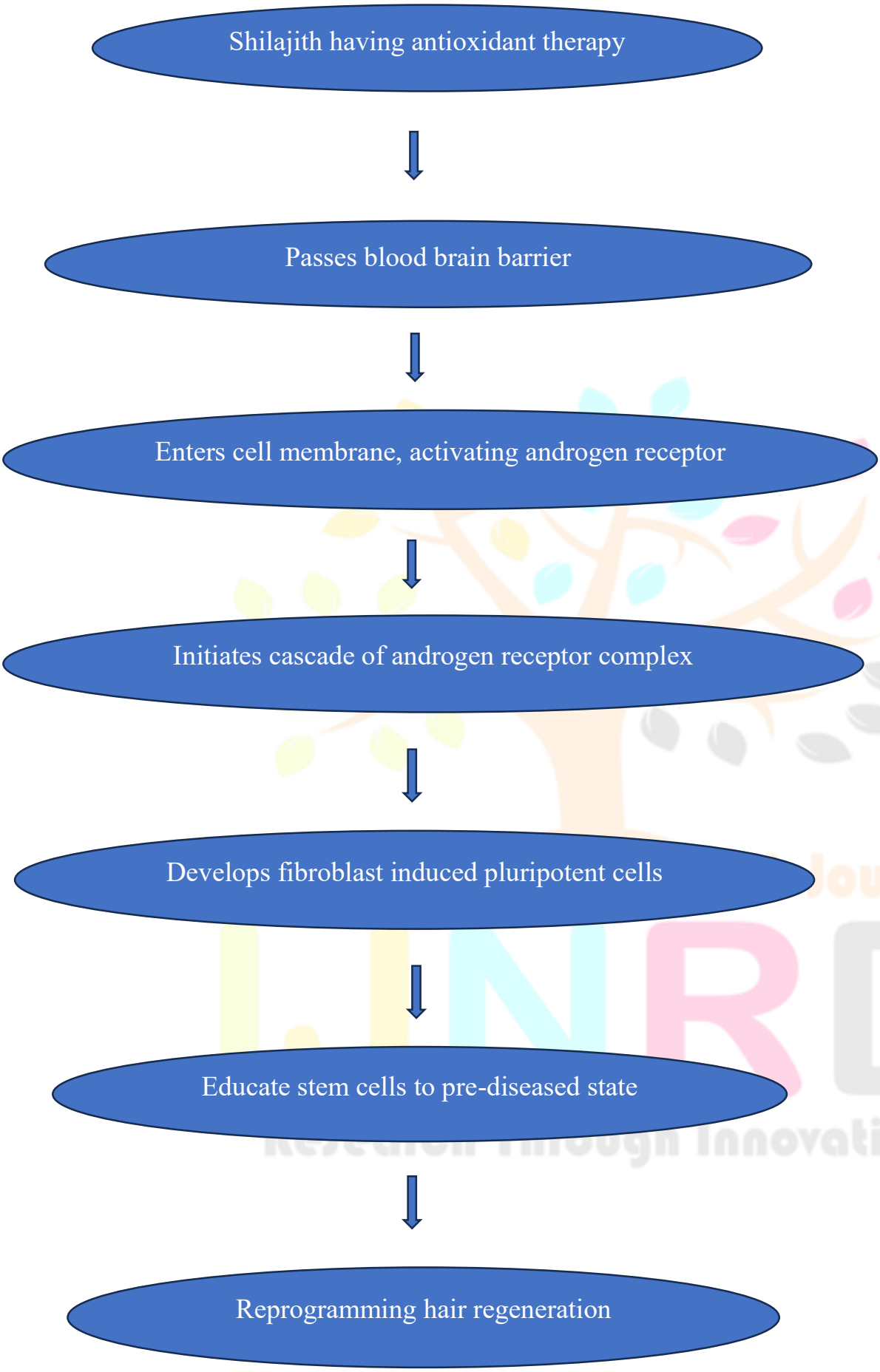
- Management should be focused on regulating 5α-Reductase stage by activating the stem cells. Attempts made to activates the hair follicle right from the
- Telogen – by decreasing the time of phase.
- Exogen – by making the club hair pop out.
- Kenogen – the empty hair follicle got filled with new hair.

Role of Gomutra Shilajit –

❖ It is a herbomineral drug composed of 60-80% Humic acid which is a brilliant antioxidant preventing O_2 free radicals.

❖ Fulvic acid present in it possess anti-inflammatory properties reduces the level of pro-inflammatory cytokines like TNF-α, IL-β,IL-6,IL-10 which leads to catagen phase.

❖ It promotes IGF-I,Islet beta cells helps in proliferation and growth of hair just like stem therapy.



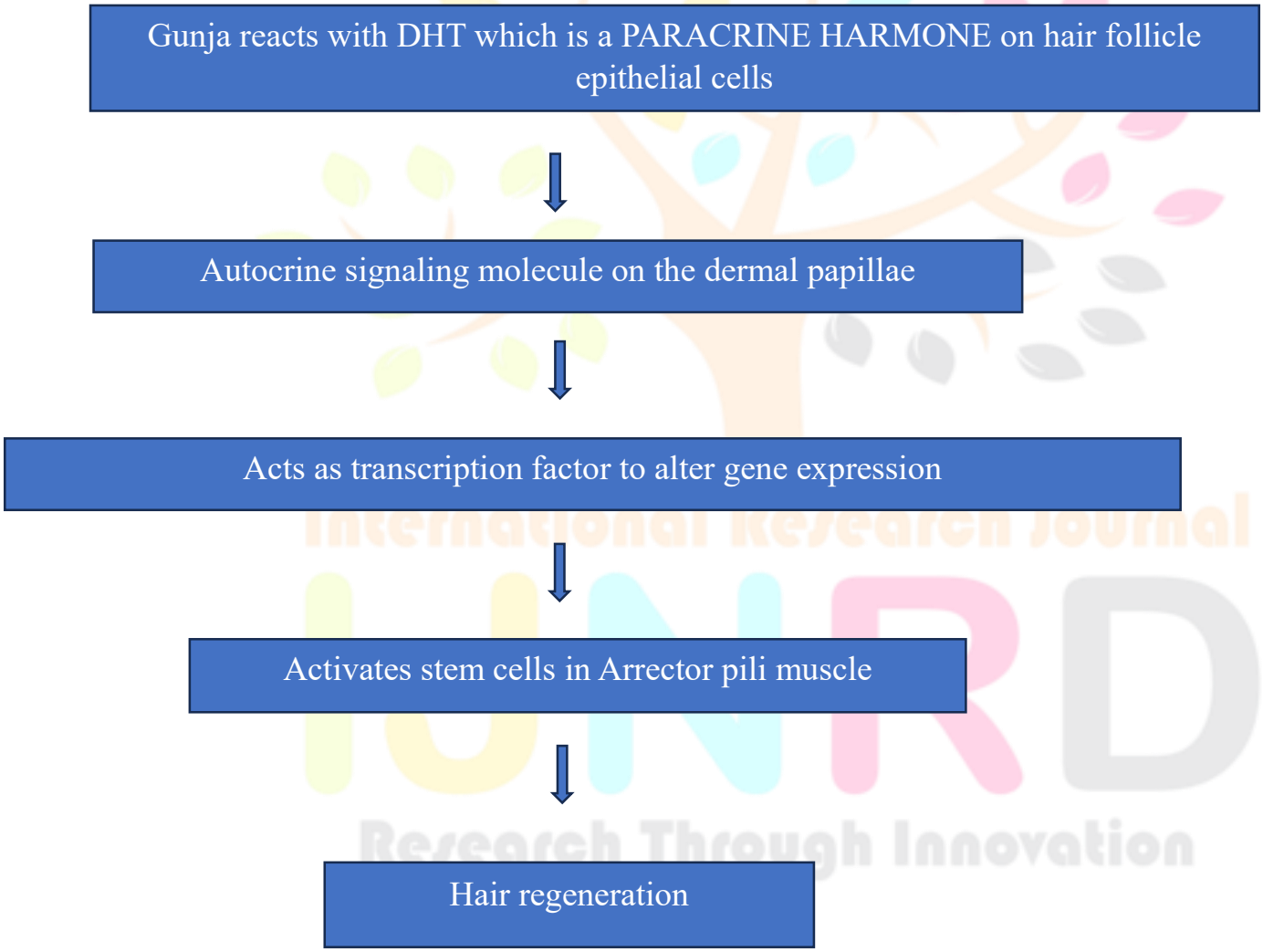
Role of Godugdha shodhita Gunja beeja churna in AGA –

❖ In AGA, obstructed sebum glands which are suggestive of hyper seborrhoea can be seen because of excess DHT levels. This sebum clogs, hampers the hair regeneration as said in samprapti caused by kapha, the need of activation of hair follicle through induction of mild irritant is necessary.

❖ Gunja Beeja with Tikshna guna, Ushna virya, Tikta Rasa irritates the lesions and reactivates Hair follicle.

❖ With the pressure buffer concept of AGA, these Gunja seeds are Tridosha Shamak only not Tridoshahara as we need to maintain homeostatic buffer but not to reduce hydration at follicular level.

❖ The calcium content present in Gunja seeds activates the conductance of potassium channels helps in repolarising the membrane and triggers the cell again for proliferation.



Conclusion

❖ With the action of keshika property of Shilajith may alter the gene expression and programmed it to pre-diseased state just like stem cell therapy.

❖ Gunja activates stem cells present in the Arrector Pili muscle and due to its Teekshna guna, Ushna veerya it clears blockage caused by Sebum and helps in hair regrowth.

❖ By using the above treatment modalities, by applying the concept of hair cycle patterns and the affect of AGA we can break the samprapti of Khalitya.

References –

1. Carlos Carrasco-Gallardo., Leonardo Guzman., Richardo B Maccioni., (February 2012) Shilajith : A Natural Phytocomplex with Potential Procognitive Activity. International Journal Alzheimer's Disease.2012 February 23;2012;674142. RODOI:10.1155/2012/674142 PMCID:PMC3296184 PMID:22482077.
2. Rohit Singh., Galib Ruknuddin., Pramod Yadav., (December 2021) Research Developments in Immunomodultory and Antioxidant Activities Of Shilajatu. Article In Indian Drugs December 2021 DOI:10.53879/id.58.09.11977. Retrieved from https://www.researchgate.net/publication/357040645
3. Anamika Das., Vernika Jain., Amarnath Mishra., (December 2016). A Brief Review on a Traditional Herbal : Abrus precatorius (L).International Journal Of Forensic Medicine And Toxicological Sciences., October-December,2016:1(1):1-10.Retrieved from https://www.ipinnovative.com/journal-article-file/3706
4. Dr.Princy Purwar., Dr.Yadav S.S., Dr Pragya Gangele., (April 2019). Khalitya (Hairfall) Management-Ayurvedic Perspective. International Journal Of Health Sciences and Research.Vol.9.,Issue:4;April 2019.,ISSN:2249-9571.Retrieved from www.ijhsr.org
5. Jayakar Thomas(2018) The Alopecias (1st ed.) Chennai., Tamilnadu : The Health Sciences Publisher.
6. Sawaya ME., Price VH., Different Levels Of 5alpha-Reductase Type I and II, Aromatase, And Androgen Receptor In Hair Follicles Of Women And Men with Androgenetic Alopecia. J Invest Dermatol. 1997;109:296–300. DOI: 10.1111/1523-1747. ep12335779.
7. Paus R., Muller-Rover S., Van Der Veen C., et al. A Comprehensive Guide for the Recognition and Classification of Distinct Stages of Hair Follicle Morphogenesis. J Invest Dermatol. 1999;113:523–532. DOI: 10.1046/j.1523 1747.1999.00740.
8. Stenn KS., Paus R., Controls of Hair Follicle Cycling. Physiol Rev. 2001;81:449–494. DOI: 10.1152/physrev.2001.81.1.449.
9. Hibberts NA., Howell AE., Randall VA., Balding Hair Follicle Dermal Papilla Cells Contain Higher Levels of Androgen Receptors Than Those from Non-Balding Scalp. J Endocrinol. 1998;156:59–65. DOI: 10.1677/joe.0.1560059.
10. Alfredo Rossi., Martina Ferranti., Francesca Magri., Marco Di Fraia., Gemma Caro., Maria Caterina Fortuna., Marta Muscianese., Simone Michelini., Marta Carlesimo.,(April 2022) Clinical And Trichoscopic Graded Live Visual Scale for Androgenetic Alopecia. National Library of Medicine. Dermatol pract concept.2022 April;12(2); e2022078. DOI:10.5826/doc.1202a78;PMCID: PMC9116551P PMID:35646460.
11.