NEWSLETTER

DERM-CONNECT

INDIAN ASSOCIATION OF DERMATOLOGISTS,
VENEREOLOGISTS AND LEPROLOGISTS
(DELHI STATE BRANCH)

OCTOBER- DECEMBER 2024 VOLUME 1 ISSUE 4

THEME:

RISE OF COSMECEUTICALS IN DERMATOLOGY

MESSAGE FROM PRESIDENT, IADVL-DSB - Dr. GULHIMA ARORA

Dear Members of the IADVL Delhi State Branch,

It is a sheer pleasure to reach out to you again as President DSB 2024-25. This newsletter of the third quarter is themed "Rise of Cosmeceuticals in Dermatology" and brings to you topics which are pertinent to a dermatologist's prescription today.

Along with the presentation of this edition of the newsletter, I would also like to appraise all our readers and State Branch members of another academic milestone that we have accomplished, My Presidential initiative, and that is the launch of the Journal of Comprehensive Dermatology, the official journal of the Delhi State Branch. It is accessible at https://jcderma.com. Articles are invited for submission to the same at https://editorialassist.com/#/login/jcd.

This quarter has been a very fruitful one for the State Branch, as we conducted a very successful Dermazone North Conference form the 4-6th October 2024, held at Leela Ambience Convention Center, East Delhi. I thank the National and DSB EC its members for having actively participated and contributing to showcasing the academic and organizational strength of the Delhi State Branch.

We have also conducted an SIG Aesthetics workshop, The PGPDT North, the Dermavyakhya webinar on the latest in the medical management of hair restoration, and a monthly meet at UCMS and GTB hospital in this quarter. The DSB is thankful to all the members associated with these.

We conducted a 'Chalo Pathshala' activity at a government school, to spread awareness regarding the right approach to skin concerns.

The Christmas fete held on the 22nd of December 2024, was a hugely appreciated, fun-filled social activity for all the DSB members.

The DSB also concluded its AGBM on the 22nd of December 2024 and announced the new EC.

I thank the Editor of this newsletter, Dr. Ishmeet Kaur, and the Co-ordinator Dr. Shikha Gupta, for putting this newsletter together for all of us. The DSB is thankful to the academic partners of this newsletter for their support. Congratulations to all the contributors of this edition.

With that, I wish you all a happy reading.

Regards,
Dr. Gulhima Arora
LM/ND/3550
President,IADVL DSB 2024-25.

MESSAGE FROM HONORARY SECRETARY, IADVL-DSB - Dr. HIMANSHU GUPTA

Dear DSB members,

As the Hony Secretary, IADVL Delhi State Branch, I welcome you all to enjoy the contents of the fourth issue of the newsletter of the year 2024-25, the theme of which is 'Rise of Cosmeceuticals in Dermatology'. The articles shared by eminent dermatologists in our city are concise and well-informative. In addition, we are excited to share with all of you, the remarkable journey we have experienced over the previous three months, working for the State Branch.

As far as this quarter's activities are concerned, we got the opportunity to host the Dermazone North 2024 from October 4th- 6th and it turned out to be a successful event. Moreover the turnout in the monthly meet hosted by UCMS and GTB Hospital affirms the academic inclination of our branch members. We also conducted events like the SIG Aesthetics workshop, the PGPDT North meet and the Dermavyakhya webinar on medical management of hair restoration, all of which were well-received. We also attempted to spread awareness in community as a part of Çhalo Pathshala' activity. The Christmas fete held on 22nd December was an event where branch members and their kin celebrated together and had great fun. On the same day, DSB held its AGBM and announced the new EC.

Lastly, I would like to thank the branch members for their continued support and contribution towards all branch events. Together we shall endeavour to take our branch to even greater heights.

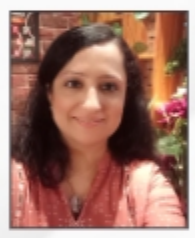
Long live IADVL!

Thanking you,
Dr. Himanshu Gupta
Hony Secretary, IADVL DSB 2024-25

OUR TEAM

NEWSLETTER

EDITOR
Dr Ishmeet Kaur



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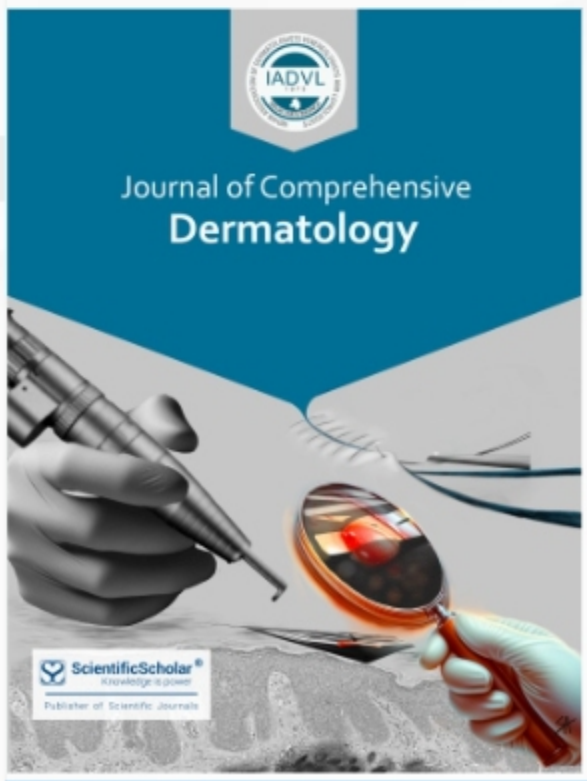

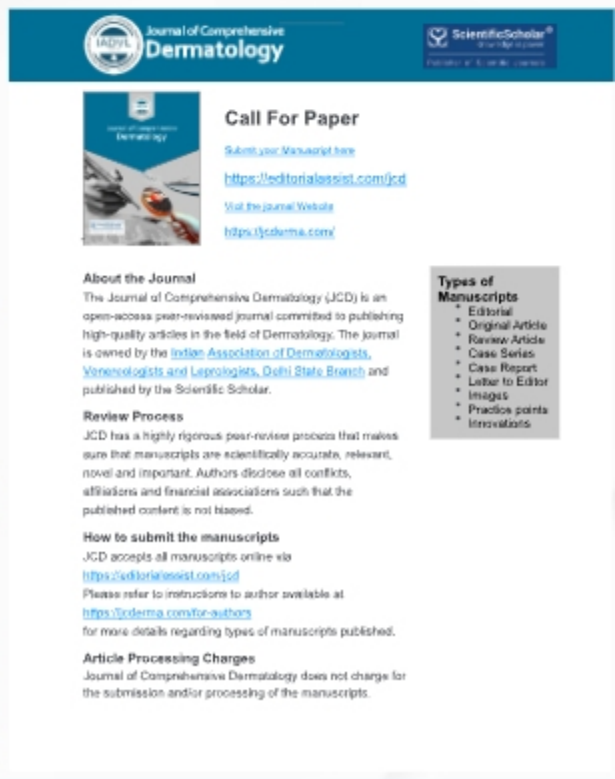

INVITING ARTICLES

Those who are interested in publishing their articles in the next issues of IADVL-DSB newsletter can mail them to: **dr_shikhaarora@yahoo.co.in**

EDITOR'S NOTE

Dear Readers,
In recent years, the field of dermatology has witnessed a remarkable evolution, driven by a blend of science, innovation, and the ever-growing demand for products that not only enhance beauty but also improve skin health. Cosmeceuticals—an intersection of cosmetics and pharmaceuticals—have emerged as a cornerstone of this transformation.

These advanced formulations go beyond aesthetic appeal, offering therapeutic benefits backed by scientific evidence. Ingredients such as retinoids, peptides, antioxidants, and growth factors have redefined how we address skin concerns like aging, hyperpigmentation, acne, and photodamage. For dermatologists, cosmeceuticals represent a powerful tool to complement clinical treatments, enhance patient outcomes, and provide tailored solutions for diverse skin types and needs.
However, with the market flooded with products claiming miraculous results, the role of the dermatologist has become pivotal. As trusted experts, we must guide our patients through this maze, separating scientifically validated formulations from mere marketing hype.

Therefore, in this edition of DERM-CONNECT we decided to focus on the theme, "COSMECEUTICALS IN DERMATOLOGY", where we delve deep into the science, trends, and controversies surrounding cosmeceuticals. From expert reviews of breakthrough ingredients to insights on their role in addressing common dermatological conditions, our aim is to provide you with a comprehensive resource that bridges knowledge with practice.
I would like to thank our esteemed contributors for sharing their expertise and insights. Your articles, with creative inputs have elevated this issue, providing our readers with valuable knowledge and inspiration. A special thanks to Dr. Shikha Gupta for her dedication and immense contributions behind the scenes. The hard work, creativity, and passion of the whole team under the guidance of Dr. Gulhima Arora makes every page a testament to collaboration and purpose.

To our readers, your trust and enthusiasm fuel our commitment to delivering quality content. Your engagement, feedback, and loyalty motivate us to continually strive for excellence. I hope you enjoy reading the issue as much as we enjoyed crafting it. Happy Reading!

Warm regards,
Dr. Ishmeet Kaur
MBBS, MD Dermatology
Director & Co-founder, Dermosphere Clinic
Consultant Dermatologist, Venkateshwar Hospital, Delhi

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COSMECEUTICALS FOR ANTI-AGING: EVIDENCE AND REVIEW

DR. AMANDEEP SALUJA
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Cosmeceuticals have gained significant popularity in recent years, largely driven by the power of social media and influencers. These products, which combine the benefits of cosmetics and pharmaceuticals, have tapped into the growing demand for effective anti-aging solutions, skincare innovations, and appearance-enhancing treatments.
The term was coined in 1984 by Dr. Albert Kligman to describe products that blend the effects of pharmaceuticals (active, scientifically proven compounds) with cosmetics (products designed for aesthetic purposes).[1] Cosmeceuticals typically contain biologically active compounds that target specific skin concerns, like wrinkles, pigmentation, and loss of elasticity. Some of the most common include retinoids, Vitamin C, Peptides, hyaluronic acid, and growth factors. Other newer molecules like Bakuchiol, Tetrahydrojasmonic acid, Methyl Estradiolpropanoate, Timosaponin A-III (TA-III), Protocatechuic acid, Grammatophyllum speciosum, and Jasmine rice panicle extract have also been studied.[2]

Rabe et al. divided the therapies for anti aging into three categories as mentioned in table 1.[3]

Photoaging therapies categorized by type of treatment/prevention strategy and disease severity		
Primary	Secondary	Tertiary
Photoprotection	Photoprotection	Chemical Peels
	Retinoic acid	Microdermabrasion/ microcoblation
	Antioxidants	Lasers
	Estrogens	Botulinum Toxin
	Growth factors	Fillers

RETINOIDS

Retinoids are the natural and synthetic Vitamin A derivatives and are the most commonly found ingredient in cosmeceuticals. These molecules are lipophilic which helps them easily penetrate the epidermis. They bind to several classes of proteins that result in the activation of specific regulatory genes that are involved in cell differentiation, proliferation, and apoptosis.[4] Retinoids are divided into three classes depending on their molecular structures. The chief retinoids available are retinoic acid (tretinoin), retinol, and retinaldehyde.

Retinoic acid: Tretinoin is the most commonly used molecule for treating wrinkles, fine lines, and to some extent, pigmentation, making it the gold standard. It accelerates cell turnover by significantly increasing the thickness of the epidermal and granular cell layers which helps to improve the skin's overall texture and appearance. It promotes a more even distribution and density of these Keratinocytes and reduces melanocyte vacuolization. In the dermis, it has been shown to stimulate angiogenesis and the production of new elastic fibres and glycosaminoglycans (GAGs) maintains the skin's structure, elasticity, and moisture retention.[5]

Olsen and colleagues, 1997 evaluated the histological and clinical changes occurring in 298 patients after once daily application of either 0.05% or 0.01% tretinoin emollient cream for 1 year. Significant improvement in histological and clinical markers was observed in both the 0.05% and the 0.01% tretinoin group as compared to the vehicle.[6]

Retinol: It is a weaker retinoid and therefore less irritant compared to the other retinoids. It absorbs UV light in shorter wavelengths and could be useful as a filter in the most biologically active solar UV range (290–320 nm). (7). Fisher and colleagues (1996) demonstrated that retinol inhibits UV induction of MMP and stimulates collagen synthesis in photoaged skin.[8]

Retinaldehyde: It is a precursor of retinoic acid. In human keratinocytes, it transforms from retinaldehyde to retinoic acid and retinol and hence is used in the treatment of anti-aging with a more controlled delivery and weaker side effects.[5]

ANTIOXIDANTS

Antioxidants are a popular category in the market. The oxidative stress caused by the oxygen free radicals fastens the process of aging and antioxidants help in reducing the oxidative stress thereby acting as anti-aging agents.

Ascorbic acid is the most widely used molecule in both oral and topical forms to address concerns of aging and pigmentation. It acts as a cofactor essential for the enzymatic activity of prolyl hydroxylase, which hydroxylates prolyl residues in procollagen and elastin. Additionally, ascorbic acid is commonly used as a depigmentation agent because of its ability to inhibit tyrosinase activity.[9]

Glutathione also known as the super antioxidant is on the current rise with lightening and anti-aging effects. It helps in neutralizing oxidative stress, interferes with melanogenesis, and helps in the formation of new cells.[10]

Coenzyme Q10 also acts as an antioxidant reducing interleukin 1α, reactive oxygen species (ROS), and matrix metalloproteinase-1 production in UV-irradiated cells, and enhances collagen and elastin gene expression. It also inhibits tyrosinase activity, thus inhibiting melanogenesis. Due to these properties, coenzyme Q10 is also incorporated in anti-aging products.[4]

Other antioxidants, such as cyanidin and malvidin-3-O-glucosides—molecules from the anthocyanin family—show inhibitory activity against skin-degrading enzymes like hyaluronidase, collagenase, and elastase, which are key in maintaining the structural integrity of the skin. However, these anthocyanins face stability issues. To address this, structural derivatives of anthocyanins, like carboxypyranocyanidin-3-O-glucoside, offer enhanced stability and could be incorporated into topical formulations for cosmeceutical applications.[11]

NIACINAMIDE

Nicotinamide supplementation helps restore cellular NAD+ levels, improves mitochondrial function, reduces oxidative stress and inflammation, enhances the extracellular matrix and skin barrier, and inhibits the skin's pigmentation process. While nicotinamide (niacinamide) is primarily used as a dietary supplement for vitamin B3, its pharmaceutical and cosmeceutical applications have been widely studied.[12]

PEPTIDES

The process of aging mainly focuses on wrinkle formation that occurs due to decreased production and increased degradation of extracellular matrix proteins such as collagen, fibronectin, elastin, and laminin. Cosmeceutical peptides can function as signal modulators of extracellular matrix components, as well as structural peptides, carrier peptides, and modulators of neurotransmitter activity. Pentapeptide-3 ((Lys-Thr-Thr-Lys-Ser, KTTKS) was one of the first oligopeptides to be developed as a cosmetic agent. It is a subfragment of the carboxyl-terminal propeptide of type I collagen. A study in 180 women by Osborne et al. showed that pal-KTTKS significantly decreased the bumpy texture and fine lines as compared to controls.

Tripeptide1,2, 3/5, 10, peptamide 6, soybean amino acids, and rice peptides have a role in anti-wrinkle, anti-aging, moisturization, and firming effects. Dipeptide-2 acts as an ACE inhibitor resulting in lymph drainage and is thus useful in baggy eyelids and skin laxity. Wherein neurotransmitter inhibitor peptides address periorbital wrinkling by giving a botox-like effect via acetylcholine receptor and inhibitor of catecholamine release.[13]

HYALURONIC ACID

Ageing causes a decrease in hyaluronic acid production leading to moisture loss, skin volume reduction and elasticity, and the formation of wrinkles and fine lines. Hyaluronic acid has been incorporated as a cosmeceutical as it moisturizes and protects against oxidative stress. Sodium hyaluronate is a derivative that is stable and allows deeper penetration hence used widely in commercial skin, hair, and nail care products.

Hyaluronic acid-based injectables for dermal fillers are also readily available in the market to restore skin volume and reduce lines, folds, and wrinkles. It is popular for its safety and efficacy even though its effect is temporary. Its strong water-retaining capacity provides hydration and structural support to the epidermal and dermal layers of the skin making it useful as an adjuvant to increase epidermal penetration of other active agents.[4]

GROWTH FACTORS

Growth factors have emerged as a newer category in the cosmeceutical industry, largely due to their powerful ability to modulate cellular behavior. These bioactive molecules can stimulate various processes in the skin, such as cell growth, repair, and regeneration. Their role in improving the function of aging skin cells is particularly compelling, as they can potentially reverse or slow down some of the visible effects of skin aging.[14]

Among the various types of human growth factors, epidermal growth factor stands out as one of the most significant for skin health by directly influencing the growth and differentiation of keratinocytes.

HORMONE REPLACEMENT THERAPYEPTIDES

Hypoestrogenism leads to decreased skin hydration and thinning, which has resulted in the use of hormones in topical formulations. Long-term prospective, randomized, double-blind, placebo-controlled studies on hormone replacement therapy in women have shown that skin aging signs were reversed and skin elasticity, hydration, and thickness were significantly increased. However, long-term studies to evaluate the safety of systemic HRT for skin anti-aging purposes are necessary.[15]

CONCLUSION: The cosmeceutical market is booming but the line between over-the-counter products and doctor prescribed is still blurred. Even though various studies with documentation have stated the efficacy of these products, the creation of a cosmeceutical category, akin to the quasi-drug category in Japan, would pave the way for stronger evidence in the cosmeceutical field. This would offer manufacturers and doctors a clearer understanding of the efficacy of specific ingredients and final formulations. (14) Until such legislation is implemented, cosmeceuticals will continue to lack the evidence-based support needed for legitimacy.

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ROLE OF ANTIOXIDANTS IN SKINCARE

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INTRODUCTION

Skin serves as a protective organ that plays an important role in defending both external and internal toxic stimuli and maintaining homeostasis. It is increasingly evident that oxidative stress is involved in numerous skin diseases. Endogenous or exogenous antioxidant mechanisms neutralise these reactive molecules. Thus, antioxidative strategies can serve as effective and easy methods for improving these conditions.[1] Antioxidants play a crucial role in skin care, protecting the skin from oxidative stress, inflammation and the damage caused by free radicals. Topical and oral antioxidants are increasingly used in skin care and dermatological treatments to address various skin concerns, from aging and hyperpigmentation to acne and rosacea.

WHAT ARE ANTIOXIDANTS?

Antioxidants are molecules/substances that neutralize free radicals and unstable molecules that damage skin cells. Free radicals are formed due to environmental stressors (UV radiation, pollution), metabolic processes and aging. Antioxidants counteract oxidative stress, thereby reducing skin damage and inflammation.

The cutaneous antioxidant system consists of enzymatic and non-enzymatic substances

TYPES OF ANTIOXIDANTS[1]

- Enzymatic: superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx)
- Non-enzymatic (low molecular weight antioxidants):
- Vitamins : vit A, E and C
- Hormones: estradiol, melatonin
- Polyphenols: green tea extract, resveratrol, quercetin
- Carotenoids: lycopene, beta-carotene
- Minerals: zinc, copper, selenium
- Plant extracts: ferulic acid, grape seed extract, pomegranate extract2

Table 1. Elucidates the mechanism of action of various enzymatic and non-enzymatic antioxidants.[3,4]

Topical antioxidants

- Vitamin C : brightens , forms and protects
- Retinoids: anti-aging and collagen synthesis
- Ferulic acid: antioxidant and anti-inflammatory
- Green tea extract: antioxidant and anti-inflammatory
- Niacinamide : improves skin elasticity and reduces inflammation

Oral antioxidants

- Vitamin C : boots collagen production and improves skin texture5
- Vitamin E: protects against UV damage and reduces inflammation
- Polyphenols: green tea, resveratrol and quercetin
- Carotenoids: lycopene and beta-carotene

INDICATIONS OF ANTIOXIDANTS IN DERMATOLOGY

Photodamage

The entire solar spectrum generates free radicals leading to photoaging, photoimmunosuppression and photocarcinogenesis.1 Antioxidants help in the prevention and repair of UV induced photodamage. Oral antioxidants such as Polypodium leucotomos reduce the appearance of solar erythema and polymorphic light eruption. Lutein (carotenoid), absorbs the blue light and has a protective effect on the oxidative damage caused by sunlight. Topicals like vitamin E, C, ubiquinone and grape extract have shown positive results in inhibiting the damage caused by UV radiation.

Aging

In skin aging, there is a progressive accumulation of pro¬teins, DNA and modified lipids,

reinforcing the association between ROS and intrinsic aging. Ubiqinol (coenzyme Q10), in its reduced form prevents the oxidative activity and regenerates alpha-tocopherol. It is the only soluble lipid antioxidant that animal cells can synthesize and there is an enzymatic process to regenerate it. Superoxide dismutase (SOD), is a strong endogenous antioxidant that prevents degenerative changes due to collagen degradation.

Melasma

UV radiation causes oxidation of dopaquinone, leading to UV induced melanogenesis. Antioxidants such a vitamin C, reduce dopaquinone (DOPA) and prevent the formation of free radicals. Superoxide dismutase and glutathione peroxidase also play a vital role in maintaining the redox equilibrium. Agents like ascorbic acid and ellagic acid have a skin whitening role by inhibition of tyrosinase.

Non-melanoma skin cancer

Acute exposure of human skin to solar radiation can lead to oxidation and increase the risk of carcinogenesis. Endogenous photoprotection with antioxidants (catalase, glutathione peroxidase and glutathione reductase in epidermis and tocopherol, ubiquinol 9, ascorbic acid and glutathione in dermis) is complementary to photoprotection with sunscreens, and is cur¬rently the most adequate form of photocarcinogenesis prevention, in addition to, use of hats and shadows.

Psoriasis

In patients with active psoriasis, there is a depletion of natural enzymatic and non-enzymatic antioxidant systems. Certain treatment options like phototherapy and methotrexate are also capable of generating ROS. Eventual use of antioxidants helps to recover the redox balance, leading to an anti-inflammatory effect, by the activation of antiproliferative and proapoptotic pathways, both in the local and in the inflammatory cells.

Other dermatoses

Melanoma – daily consumption of carotenoids, vitamin C and leutin rich foods have shown lower risks of melanoma in patients. Polypodium leucotomos has shown to have limiting role in the melanoma cell growth. Antioxidants may have a significant in other dermatoses (alopecia areata, atopic dermatitis, seborrheic dermatitis, lichen planus, vitiligo, pemphigus, acne, rosacea and chronic venous ulcer) with oxidative stress and aberrant antioxidant mechanisms.

Conclusion

Antioxidants are essential in dermatology, offering numerous benefits for skin health. Topical and oral antioxidants can be used alone or in combination to address various skin concerns. Use of antioxidants should always be in line with treatments or other preventive measures However, the regimen should be started only after consultation as per individual skin types and concerns. Use of supplements without indication, or ingested in high doses, or even for a prolonged time can cause adverse events precisely in the physiological antioxidative balance. Hence there is a need of medical monitoring.

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Suggested reading

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Table 1. Mechanism of action of various enzymatic and non-enzymatic antioxidants

Enzymatic antioxidants • Superoxide dismutase (SOD) • Catalase (CAT) • Glutathione peroxidase (GPx)	***Mechanism of action*** • Metalloenzyme, catalyzes the dismutation of O_2, free radical into O_2 and H_2O_2 • Co-factor- iron or manganese, catalyzes H_2O_2 into O_2 and H_2O • Intracellular enzyme, selenium dependent, breaks H_2O_2 into water and lipid peroxides
Enzymatic antioxidants • Glutathione (GSH) • Uric acid • Phenolic compounds • Carotenoids • Vitamin C • Vitamin E	***Mechanism of action*** • Scavenger of oxygen free radicals , regenerates other oxidized antioxidants (vit C and E) • Scavenger of free radicals and stong electron donor • Act as secondary antioxidants (gallic acid, caffeic acid, epicatechin, resveratrol) by binding to potentially pro-active metal ions. • Act as single electron transfer and hydrogen atom transfer, peroxyl radical scavengers • Produce reactions with oxidizing agents • Prevents lipid peroxidation chain reactions and quenches free radicals

TOPICAL RETINOIDS AS COSMECEUTICAL AGENTS

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INTRODUCTION

Topical retinoids have gained widespread popularity in the cosmeceutical industry due to their remarkable efficacy in treating a variety of skin conditions such as aging, acne, and pigmentation disorders. These compounds, which are derivatives of vitamin A, work by stimulating skin cell turnover, improving collagen production, and enhancing the overall texture and appearance of the skin. Over the years, advancements in the development of selective retinoid compounds and their formulations have focused on minimizing irritation while maximizing their therapeutic benefits.[1-7] This chapter explores the different types of topical retinoids, their mechanisms of action, and the promising associations that enhance their effects when combined with other active ingredients.

1. TYPES OF TOPICAL RETINOIDS

Retinoids include a broad spectrum of vitamin A derivatives, with the most commonly used in cosmeceuticals being **retinaldehyde, retinol,** and **retinyl esters.** These compounds work by binding to retinoic acid receptors (RARs) in the skin, which regulate gene expression involved in skin cell growth and differentiation.

1.1 Retinaldehyde

Retinaldehyde is a more tolerable retinoid compared to its counterpart, retinoic acid. It is known for causing less irritation, which significantly improves patient compliance. The effectiveness of retinaldehyde in treating photoaging, such as fine and deep wrinkles, has been well-documented. One of the major advantages of retinaldehyde is its ability to deliver low concentrations of retinoic acid at the cellular level, which helps to prevent the irritation typically associated with higher levels of retinoic acid. Additionally, retinaldehyde's unique biological action, independent of receptor activation, contributes to its positive effects in treating skin conditions like acne, pigmentation issues, and aging.[2-4]

Retinaldehyde is also notable for its ability to reduce skin pigmentation. Its depigmenting effects are attributed to its ability to promote epidermal turnover and its antioxidant properties, both of which contribute to a reduction in melanin production. Studies have demonstrated significant reductions in melanin content and melanocyte activity with the use of retinaldehyde, making it a powerful ingredient in depigmenting formulations.[2-4]

1.2 Retinol and Retinyl Esters

Retinol, along with its esters (like retinyl palmitate), is commonly included in many cosmetic formulations aimed at improving skin texture and addressing signs of aging. Retinol is a natural precursor to retinaldehyde and retinoic acid, but its slower conversion process limits its immediate effectiveness. While retinol has been shown to have anti-aging benefits, it is often considered less potent than retinaldehyde due to the delay in its oxidation to active forms. In addition, the concentrations of retinol required for significant biological effects often lead to irritation, making it less suitable for sensitive skin.

Retinyl esters, although weaker precursors of retinoic acid, have better tolerability compared to retinol. These esters, especially retinyl palmitate, are commonly found in formulations aimed at enhancing skin barrier function and providing a gentle, long-term solution to improve skin appearance. The advantage of retinol and retinyl esters lies in their absorption spectrum, which allows them to act as effective UV filters, particularly in the 290-320 nm range, providing additional protection against ultraviolet (UV) damage.[2-4]

1.3 Selective RAR-γ Activating Retinoids

Recent advancements in retinoid therapy have introduced selective retinoids, such as **seletinoid G** and **trifarotene,** that specifically target RAR-γ, a receptor with the highest expression in the human epidermis. These compounds were developed to reduce irritation while still providing the benefits of traditional retinoids, such as the stimulation of collagen production and improvement in skin texture. Seletinoid G has shown potential in increasing the expression of collagen and elastin fibers in the skin, making it a promising candidate for anti-aging treatments. Trifarotene, on the other hand, has been FDA-approved for the treatment of acne and has demonstrated good tolerance and efficacy in treating moderate facial and truncal acne. The selective activation of RAR-γ in these retinoids minimizes the side effects typically associated with broader retinoid receptor activation, making them particularly attractive for those with sensitive skin.[4-7]

2. MECHANISMS OF ACTION

The therapeutic effects of topical retinoids are primarily due to their ability to influence gene expression in the skin. Retinoids bind to nuclear receptors known as **retinoic acid receptors (RARs)**, which are found in the epidermis and dermis. Once bound to these receptors, retinoids regulate the expression of various genes involved in cellular differentiation, proliferation, and apoptosis. This results in enhanced cell turnover, increased collagen production, and the promotion of smoother, more youthful-looking skin.

Topical retinoids also help in the regulation of **matrix metalloproteinases (MMPs),** enzymes responsible for breaking down collagen in the skin. By decreasing MMP activity, retinoids help preserve skin structure and prevent the formation of wrinkles. Furthermore,

retinoids can promote the synthesis of hyaluronic acid, a crucial component for maintaining skin hydration and elasticity.[2-7]

3. ASSOCIATIONS WITH OTHER ACTIVE INGREDIENTS

Recent studies have highlighted the benefits of combining retinoids with other active ingredients to enhance their efficacy and improve skin tolerance. This combination approach has gained traction in the cosmeceutical industry due to its ability to address multiple skin concerns simultaneously while mitigating the irritation often associated with retinoids.

3.1 Hyaluronan Fragments (HAFi)

One of the most promising associations is between retinoids and **hyaluronan fragments** (HAFi), which are smaller pieces of hyaluronic acid. Hyaluronan is essential for maintaining skin hydration and elasticity, and its fragmentation can stimulate the production of new hyaluronic acid in the skin. When combined with retinoids, HAFi enhances skin renewal and supports de novo hyaluronic acid synthesis. This combination is particularly beneficial for conditions such as **dermatoporosis,** a condition characterized by fragile, aging skin. The synergy between retinoids and HAFi holds significant promise for preventive treatments in the early stages of skin aging.[5-7]

3.2 Glycylglycine Oleamide (OGG)

Another novel partner for retinoids is **glycylglycine oleamide (OGG)**, a small amphiphilic molecule designed to protect connective tissues from damage caused by glycation and elastosis. OGG enhances the esterification of retinol by retinaldehyde, thereby increasing the effectiveness of these compounds in preventing skin aging and maintaining adequate vitamin A levels in the skin. Incorporating OGG into retinoid formulations could improve their stability and performance, particularly in addressing skin hypovitaminosis A.[5-7]

3.3 Other Active Ingredients

Retinoids have also been combined with **tyrosinase inhibitors, flavonoids**, and **antioxidant precursors** to improve skin pigmentation and protect against oxidative stress. Tyrosinase inhibitors help prevent hyperpigmentation, while flavonoids and antioxidants neutralize free radicals that contribute to aging. This combination approach not only enhances the anti-aging benefits of retinoids but also helps optimize their risk-benefit profile by reducing irritation and enhancing skin tolerance.

Conclusion

Cosmeceutical retinoids are key for treating skin aging, acne, and pigmentation. Innovations like selective RAR-γ-activating retinoids and ingredient combinations have improved effectiveness and reduced irritation. Retinaldehyde is preferred for its better skin penetration and tolerance. Future research will explore its synergy with ingredients like HAFi and antioxidants to enhance benefits, making retinoids vital for healthier, youthful skin.

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ROLE OF COSMECEUTICALS IN MELASMA

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INTRODUCTION

Melasma is a common dermatological condition characterized by hyperpigmentation over face and neck due to hyper-functional melanocytes that deposits excessive amounts of melanin in the epidermis and dermis. It remains a challenging concern for patients. While traditional treatments have been effective, the emergence of cosmeceuticals has expanded the options for managing this condition. In this article, we delve into the role of cosmeceuticals in melasma management, exploring their mechanisms of action, efficacy, and potential limitations.

Understanding Melasma

Melasma is a complex disorder influenced by multiple factors, including genetic predisposition, hormonal fluctuations, and ultraviolet (UV) radiation exposure. The underlying pathophysiology involves increased melanogenesis, melanocyte activation, and melanosome transfer. Besides the classical risk factors, recent studies have confirmed the

role of visible light in exacerbating melasma. Further, melasma results from interactions between epidermal melanocytes, keratinocytes, dermal fibroblasts, mast cells, vascular endothelial cells, and hormonal, genetic, as well as UV influence.[1] Moreover, solar elastosis, basement membrane disruption, increased vascularization and increased mast cell count, which strongly indicate that melasma is increasingly viewed as a photoaging skin disorder.[2,3]

The Rise of Cosmeceuticals in Melasma Treatment

Cosmeceuticals,[4] a hybrid of cosmetics and pharmaceuticals, provide active ingredients that target the multifaceted nature of melasma. These products can be incorporated into daily skincare routines to complement traditional therapies or serve as standalone treatments for mild to moderate cases.[5] Cosmeceuticals are topical cosmetic-pharmaceutical blends that improve appearance by adding ingredients that provide extra health benefits. Although they are applied topically as cosmetics, they include substances that affect the biological function of the skin. In actuality, cosmetics serve as a link between medications and personal care items. A cosmeceutical exerts a 'pharmaceutical therapeutic benefit' but not necessarily a 'biological therapeutic benefit.'[6]

Key cosmeceuticals useful in melasma management:

1. Depigmenting agents
2. Sunscreens
3. Moisturizing agents
4. Antioxidants

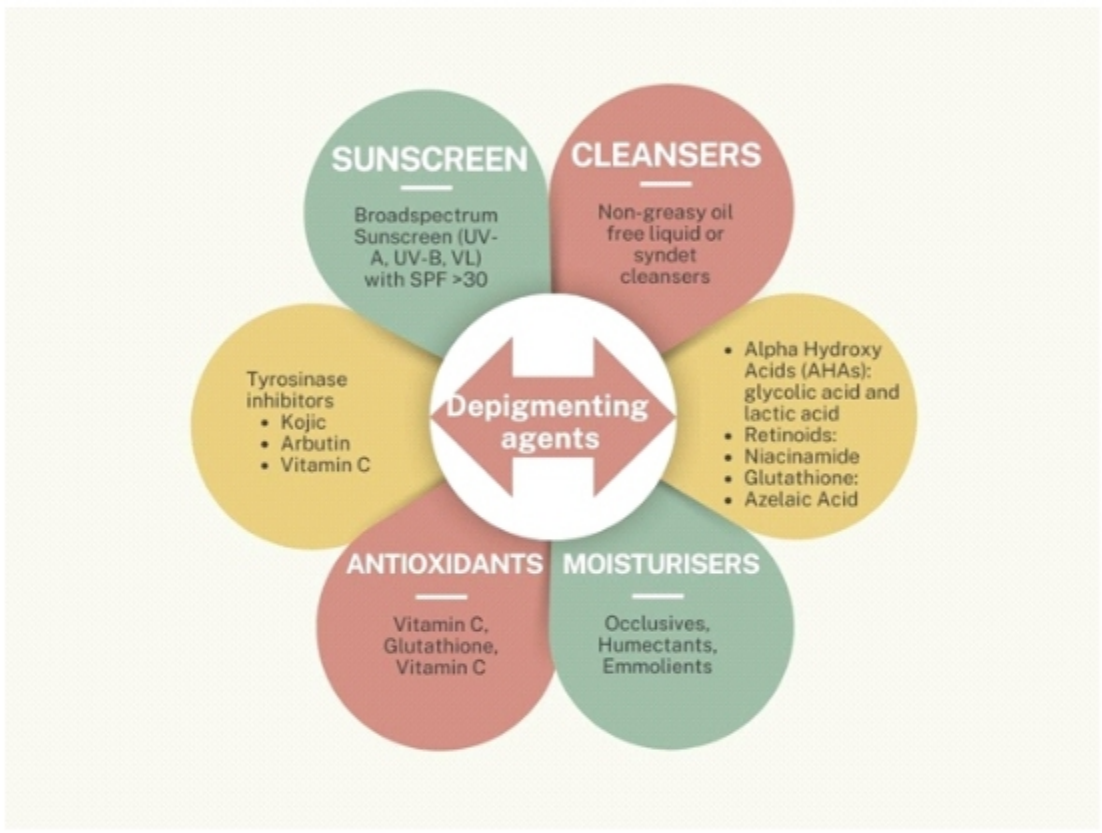

FIG 1 - Key parts of melasma management using cosmeceuticals

1. Tyrosinase Inhibitors

- Vitamin C: A potent antioxidant that inhibits tyrosinase, the rate-limiting enzyme in melanin synthesis. It also neutralizes free radicals, reducing oxidative stress. It is a potent natural antioxidant, supports anti-aging by boosting collagen synthesis, reducing collagen breakdown, and inhibiting melanin production to address hyperpigmentation. The most effective form, L-ascorbic acid, struggles with skin penetration due to its hydrophilic nature but improves with pH adjustments below 3.5. Stabilizers like ferulic acid enhance its efficacy. Alternative derivatives like ascorbyl-6-palmitate and magnesium ascorbyl phosphate (MAP) are stable at neutral pH but less effective in increasing skin L-ascorbic acid levels. Optimal Vitamin C concentrations for skin products range from 10–20%, as higher levels may cause irritation without added benefits.

- Kojic Acid: Kojic acid, a natural compound from fungi like Aspergillus and Penicillium, inhibits tyrosinase activity, reducing hyperpigmentation and acting as an antioxidant. Typically used in 1-4% concentrations in combination with other skin lightening agents. While no direct RCTs compare kojic acid to other treatments, it may benefit patients unresponsive to HQ alone.[5]

- PHENOLIC COMPOUNDS such as Hydroquinone are usually not used in cosmeceuticals due to the side-effect and safety profile.

- Arbutin: Arbutin, derived from plants like bearberry and cranberry, is a widely used skin-lightening agent. It inhibits tyrosinase activity and melanosome maturation with lower cytotoxicity than hydroquinone. While higher concentrations may increase effectiveness, they risk paradoxical hyperpigmentation. Studies suggest arbutin is less effective than kojic acid, though controlled trials are lacking. Deoxyarbutin, a synthetic derivative, offers better sustained results, general skin lightening, and comparable safety to hydroquinone. It is available in various cosmeceutical formulations such as serums, masks, collagen sheet masks, creams and various combinations.

2. Exfoliants

- Alpha Hydroxy Acids (AHAs): These acids, such as glycolic acid and lactic acid, promote exfoliation, removing hyperpigmented cells and improving skin texture.

- Retinoids: Retinoids, including retinol and retinoids, regulate cell turnover, increase collagen production, and reduce inflammation.

3. Antioxidants

- Niacinamide: A form of vitamin B3 that inhibits melanosome transfer and reduces inflammation.
- Glutathione: A powerful antioxidant that scavenges free radicals and inhibits melanin synthesis.
- Alpha tocopherol (Vitamin E)

4. Anti-inflammatory Agents

- Licorice Extract: Contains glabridin, a compound with anti-inflammatory and tyrosinase-inhibiting properties.
- Azelaic Acid: A dicarboxylic acid with antimicrobial and anti-inflammatory effects.

5. Botanical extracts

- Concerns over the side effects of conventional therapies have led to a growing interest in naturally derived extracts for hyperpigmentation. Hwang et al. studied 101 plant extracts in B16 melanoma cells and found that *Broussonetia kazwoki, B.papyrifera, Cornus officinalis, Rhus javanica,* and *Pinus densiflora* inhibited tyrosinase activity and DOPA oxidation in a dose-dependent manner[7]. Due to their minimal side effects, these extracts are increasingly used in cosmeceutical creams. Some commonly used botanical extracts for hyperpigmentation are listed below.

Name	Brief Description
Grape Seed Extract	Contains proanthocyanidin, a powerful antioxidant; oral intake benefits melasma, though topical studies are lacking.[8]
Orchid Extract	Found to be as effective as a 3% vitamin C derivative in improving melasma and lentigines.[9]
Aloe Vera Extract	Active ingredient aloin aggregates melanin and lightens skin via adrenergic receptor stimulation.[10]
Pycnogenol	Derived from pine bark (*Pinus pinaster*); has antioxidant and anti-inflammatory properties; oral intake reduces melasma severity.[11]
Marine Algae Extract	Demonstrates tyrosinase inhibition similar to kojic acid without side effects, useful in skin-lightening formulations.[12]
Cinnamic Acid	A plant-derived tyrosinase inhibitor shown to be more effective than hydroquinone in studies.[13]
Flavonoids	Polyphenolic compounds with anti-inflammatory and antioxidant properties; inhibit DOPA oxidase activity.
Green Tea Extract	Contains epigallocatechin-3-gallate; inhibits tyrosinase and has anti-inflammatory and antioxidant effects.[14]
Aloesin	Aloe vera derivative that inhibits tyrosinase and melanin synthesis at non-toxic levels; experimental product.[15]
Coffeeberry	Known for antioxidant properties; some improvement in hyperpigmentation observed with topical application.
Mulberry Extract	Inhibits tyrosinase and superoxide activity; shown to lighten skin with low IC50 values compared to hydroquinone and kojic acid.
Soy (Glycine Soja)	Contains isoflavones and protease inhibitors that inhibit melanin transfer and DOPA oxidase activity; safe and effective for hyperpigmentation with long-term use.
Licorice Extract	Derived from *Glycyrrhia Glabra*; disperses melanin and inhibits melanin biosynthesis and cyclooxygenase activity, reducing pigmentation.[15]
Umbelliferone (UMB)	A phenolic compound from the Apiaceae family with sun-blocking, antioxidant, and anti-inflammatory properties.

Table 1 – List of botanicals used in Melasma

6. Role of sun-protection

- Broad spectrum sunscreens are the cornerstone of hyperpigmentation therapy.

Avobenzone absorbs light in the UVA range. However, it is unstable. The stability of avobenzone is increased by combining with oxybenzone. Many cosmeceuticals have physical sunscreens like titanium dioxide, zinc oxide in the same formulation for added benefits

Advantages of Cosmeceuticals in Melasma Management

- Safety and Tolerability: Cosmeceuticals are generally well-tolerated and can be used for long-term management.
- Minimal Side Effects: Unlike traditional treatments like hydroquinone, cosmeceuticals have a lower risk of side effects, such as skin irritation and ochronosis.
- Gradual Improvement: Cosmeceuticals offer a gradual approach to lightening pigmentation, reducing the risk of rebound hyperpigmentation.
- Combination Therapy: Cosmeceuticals can be effectively combined with other treatments, such as topical retinoids, chemical peels, and laser therapy, to enhance results.
- Sun Protection: Many cosmeceuticals contain broad-spectrum sunscreen, protecting the skin from UV radiation and preventing further pigmentation.

Newer therapies for melasma and hyperpigmentation		
Phytochemicals -	Alocsin	• Natural compounds extracted or derived from plants
	Hesperidin	
	Ellagic acid	
	Silymarin	
	Glabridin	
	Alpha Bisabolol	
	Liquirtin	
Novel formulations	Solid lipid nanoparticles	• Form occlusive layer on the skin surface leading to hydration of the stratum corneum and enhanced drug penetration • High drug loading and increased bioavailability • KOJIC ACID, HQ, Curcumin
	Liposomes Nanosomes	• Spherical vesicles made up of a concentric phospholipid and cholesterol bilayer and can incorporate the hydrophobic and the hydrophilic drug with enhanced penetration • Nanosomes are similar to liposomes but have only a single- lipid monolayer • Arbutin liposomes
	Nano/micro-emulsions	• These are nanocarriers having two immiscible phases—the aqueous phase mixed with an oil phase with the help of surfactants • hydroquinone , Kojic monooleate • azelaic acid and hyaluronic acid • Overall promising results but limited data
	Microsponges	
	Sprays	
	Foams	
Methimazole	Topical cream has depigmenting properties in melasma patients with hydroquinone-resistance ; acts by inhibition of melanin synthesis	
Cetyl-Tranexamate mesylate (2%)	Tranexamic acid derivative	

Table 2 - Newer agents for melasma and hyperpigmentation

Incorporating Cosmeceuticals into Clinical Practice

- Patient Education: Educate patients about the chronic nature of melasma, the importance of sun protection, and the need for consistent use of cosmeceuticals.
- Personalized Treatment Plans: Develop individualized treatment plans based on the severity of melasma, skin type, and patient preferences.
- Monitoring and Follow-up: Regularly monitor patients' progress and adjust the treatment plan as needed.
- Realistic Expectations: Manage patient expectations and address potential concerns about the timeline for improvement.

Limitations and Future Directions

While cosmeceuticals offer significant benefits, they may not be sufficient for severe cases of melasma. Combination therapy with prescription medications or in office procedures may be necessary. Additionally, the quality and efficacy of cosmeceuticals can vary widely, highlighting the importance of selecting reputable brands and consulting with a dermatologist for personalized recommendations

Conclusion

Cosmeceuticals for hyperpigmentation are highly sought after in the Indian market, as they work by targeting key steps in melanin production. While hydroquinone remains the gold standard for treatment, many commercial products now incorporate botanical ingredients due to their minimal side effects. By targeting multiple aspects of the disease, such as melanogenesis, inflammation, and oxidative stress, these products offer a safe and effective approach to improving skin tone and texture. However, there is limited scientific evidence regarding their effectiveness and safety, emphasizing the need for further research. Patient compliance and regular follow-up are crucial when using cosmeceuticals, as they typically act slower than traditional treatments. Additionally, proper sun protection is essential to achieve the best results. As research continues to advance, we can anticipate the development of even more innovative cosmeceuticals to address the diverse needs of patients with melasma.

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HYALURONIC ACID USED IN COSMECEUTICAL PREPARATIONS

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What are cosmeceuticals?

Cosmeceuticals represent a category of products placed between cosmetics and pharmaceuticals that intend to enhance both the health and beauty of skin. They are said to do more than just alter appearance, but less than a therapeutic drug. Cosmeceuticals are made from a variety of ingredients, including hyaluronic acid. Given the strong claims made by various manufacturers, it is vital for the dermatologists to recognize these agents and have an understanding of their benefits, limitations and potential adverse effects.[1]

Skin aging and role of Hyaluronic Acid (HA)

Skin aging is not only due to a chronological process, but also due to the result of multiple extrinsic factors. These factors are collectively referred to as the "exposome". The main molecule involved in skin moisture is hyaluronic acid and loss of skin moisture as HA shifts to deeper layers is implicated in skin aging.[2]

Hyaluronic acid (HA) and its use in cosmeceutical preparations

HA is a polysaccharide belonging to the glycosaminoglycans, made up of disaccharide units constituted of N-acetylglucosamine and D-glucuronic acid. It is a component of the connective, epithelial, and neural tissues and it represents a substantial constituent of the extracellular matrix (ECM).[3]

In mammals, HA is synthesized by three types of HA synthases (HAS): HAS1, HAS2, and HAS3. HAS1 and HAS2 proteins exert moderate activity and form high molecular weight HA (HMW-HA; around 600–1200 daltons [kDa]), while the HAS3 protein possesses the highest activity and polymerizes into low molecular weight HA (LMW-HA; around 5–50 kDa).[2]

Commercially available HA can be isolated from animal sources or bacterial fermentation. HA has a good biocompatibility because its molecular structure is similar between different species, resulting in its biodegradable characteristics.

The applicability of HA in dermatology has increased significantly due to its hygroscopic, rheological, and viscoelastic properties, and its biocompatibility and non-immunogenecity. HA has been developed into filler injections as well as included in cosmeceuticals for topical use.[4]

HA fillers improve the appearance of aging skin but not all patients are ready to start injectables. Indeed, topical HA may provide complementary benefits. Topically applied HA-based cosmeceuticals have their place in the antiaging armamentarium of clinicians, not only to improve skin moisturization, but also skin aging signs and elasticity.

Indeed, several clinical studies indicate that topical HA is both well tolerated and effective, adjuvant to both postsurgical and facial rejuvenation procedures like fillers, microneedling, chemical peeling, fractional ablative lasers and/or continuous (CO_2), pigment lasers, laser tattoo removal, intense pulsed light, cryotherapy, injections, and minor surgery. Benefits of using topical HA in conjunction with BoNTA injection are also present in the literature.[2]

Because of the great number of polar groups present in its molecule, hyaluronic acid is a hydrophilic macromolecule with anti-ageing and hydrating claims. In aqueous solutions it can form viscoelastic gels, and when it is applied to the skin it ensures moisturizing, firming, rejuvenation, and has improved wound healing effects. HA is a hygroscopic molecule with the ability to bind 1000 times its volume in water, having the effect of softening the wrinkles by filling the spaces between the cells of the skin forming a viscid gel matrix. It has typically been classified as a humectant moisturizer, since it draws water from the dermis to epidermis. Dermal fibroblasts provide the synthetic machinery for dermal HA and are considered to be the target of pharmacologic attempts to enhance skin hydration.[2,3]

The half-life of HA in the tissues, in its natural form, is of just 12–24 hours. As a result, crosslinked forms of HA are used in topical and cosmetic preparations. Nevertheless, the high molecular weight of HA does not allow it to penetrate the deeper layers of the skin which restricts its benefits to topical effects.[3]

In cosmetic formulations, hyaluronic acid has the function of a viscosity modifier and/or a skin conditioning agent. LMW-HA can permeate the stratum corneum, epidermis, and deeper dermal layers, hence has the ability to enhance the level of moisture of the skin and expedite regeneration. HMW-HA forms a viscoelastic film when applied onto the skin and has a moisturizing effect. The main action of the HMW-HA polymer is film forming and it reduces evaporation of water from the skin and thus possesses an occlusive effect (Figure 1). HMW-HA has a positive effect on hydration of upper epidermis layers, which translates into a lower transepidermal water loss (TEWL). The cosmetic and nutricosmetic effects of HA are depicted in Figure 2.[3]

The general hydration effect of HA on the skin may also optimize dermal absorption of active ingredients and can assist their retention within the moisturized epidermal layers. Currently, there are some commercially available formulations incorporating actives in different concentrations. HA enhances the penetration of the active ingredient through the stratum corneum (SC), which behaves as a barrier to the entry of the molecule into the deeper layers of the skin, and the holding and locating the active ingredient in the epidermis. Topical preparations containing HA in formulation are used for their healing properties, decreasing the skin irritation. A topical preparation that contains HA (0.2% w/w sodium hyaluronate (NaHA)) as a main component is currently available for the amelioration of acute and chronic wounds (areas of grafted skin, post-surgical incisions, etc.)[3]

HA is used in cosmetic formulations in concentrations ranging from 0.2 to 1%. The maximum concentration of NaHA in a body lotion is 2%. When a rate of 1 mg/cm2 of a product is applied, the contribution of hyaluronic acid is 0.02 mg/cm2 of skin.[5]

HA and its sodium and potassium salts are important cosmetic ingredients that are incorporated in moisturizing and anti-ageing products. Additionally, products that contain HA represent only 5%, while more than 95% of the total products contain sodium hyaluronate. Hyaluronic acid and its derivates are incorporated in a multitude of cosmetic products for eye contour, lips, facial, and neck care, anti-cellulite body care, or cosmetic color conditioning in different cosmetic categories: creams, lotions, serums, masks. A significant number of cosmetics based on hyaluronan have been launched on the market in the last years.[3]

Some manufacturers launched cosmetic products on the market, containing HA or hyaluronates in combination with other active ingredients, like botanical extracts, vitamins, probiotics, amino acids, peptides, proteins, etc. These compounds improve the cosmetic formulation qualities and benefits, awarding additional claims.[3]

Conclusion

HA-based cosmeceuticals are a non-invasive, effective solution for improving skin hydration, rejuvenation, and healing. Furthermore, in addition to educating about healthy lifestyle habits and skin protection including the regular use of sunscreen, clinicians can advise patients that HA-based cosmeceuticals may help to counterbalance the negative impact of the exposome.

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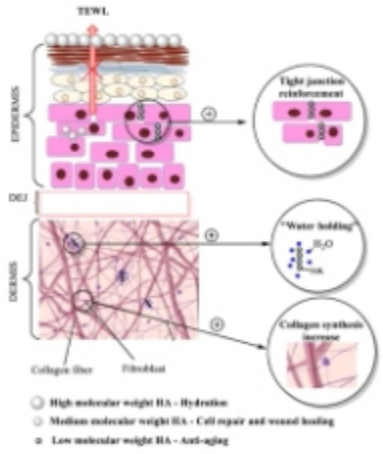

Figure 1- HA Activity as per molecular weight (TEWL – Transepidermal water loss, DEJ- Dermoepidermal junction)

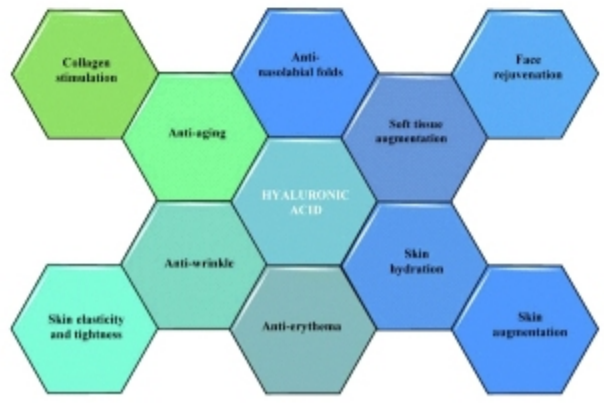

Figure 2 – Cosmetic and nutricosmetic effects of HA

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SINCLAIR

COSMECEUTICAL PEPTIDES: A BRIEF REVIEW

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Cosmeceuticals are topical product formulas designed with the aim of enhancing the look of aging skin. Unlike drugs, these products have not undergone testing and approval processes; instead, they are marketed to consumers based on the potential benefits suggested by laboratory studies of their active components. These cosmeceuticals provide biological effects to back up their cosmetic claims.

Peptides, which consist of short chains of amino acids, are a rapidly growing segment of cosmeceuticals. There are three primary types of cosmeceutical peptides: signal peptides, carrier peptides and neurotransmitter affecting peptides,.[1]

Signal peptides:

Signal peptides function as messengers that stimulate fibroblasts to produce collagen. This boost in collagen synthesis is thought to result in firmer, more youthful-looking skin. Pentapeptide-3 (Lys-Thr-Thr-Lys-Ser, KTTKS) was one of the first oligopeptides to be developed as a cosmetic agent. [2]

When applied topically, these peptides face challenges such as instability on or within the skin and limited skin permeability, hindering effective dermal delivery. To address this issue, the peptide was combined with a fatty acid, specifically palmitic acid (pal-KTTS), to enhance its stability and ability to penetrate the skin.
Table 1 enlists the various commonly used signal peptides and their respective indications. [3]

Carrier peptides:

They are responsible for transporting copper to the skin in order to stimulate enzymatic pathways involved in wound healing. Glycyl-L-histidyl-L-lysine (GHK) is the most widely studied carrier peptide.

GHK-Cu glycyl-histidyl-lysine (tripeptide 1): It is a potent activator of acute and chronic wound healing. Induces collagen remodelling by upregulating levels of MMP-2, TIMP-1 and TIMP-2. Also, there is increased synthesis of dermatan sulphate and chondroitin sulphate, antioxidant responses. Owing to all these actions this peptide enhances skin firmness and texture while simultaneously reducing facial wrinkles, fine lines, and hyperpigmentation.[4]

Manganese tripeptide complex-1 GHK-Mn: It stimulates matrix protein growth, antioxidant responses and manganese-superoxide dismutase pathway

Neurotransmitter-inhibiting peptides:

They are the latest addition to cosmeceutical peptides. Designed to mimic botulinum toxin, they block acetylcholine release at the neuromuscular junction. For effective results, these peptides must penetrate the skin and subcutaneous tissue to reach the deeper muscles in sufficient concentrations. Currently available neurotransmitter-inhibiting peptides in the cosmeceutical market reduce wrinkles and fine lines by relaxing muscles and minimizing facial muscle contractions. This group of peptides includes the following:

Acetyl hexapeptide-3 (Acetyl-glutamyl-glutamyl-methoxil-glutaminyl-arginyl arginylamide) is a synthetic peptide derived from the N-terminal domain of the protein synaptosomal-associated protein-25. It commercially known as Argireline. It has botox-like via SNARE inhibition and catecholamine release

Pentapeptide 18: It works by binding to the enkephalin receptor on the surface of nerve cells, triggering a conformational change.[5]

Pentapeptide 3: Competitive antagonist at acetylcholine receptors.

Dipeptide diaminobutyroyl benzylamide diacetate (tripeptide 3): Results in reversible inhibition of nicotinic acetylcholine receptors at the post-synaptic membrane, blocking acetylcholine from binding to these receptors. Also, it mimics effect of waglerin, a neurotoxin found in the venom of the temple viper.

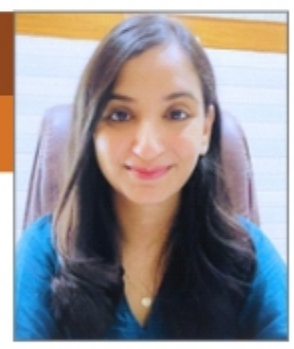
The use of peptides as cosmeceuticals offers several benefits, such as their role in various physiological functions of the skin, their specificity, minimal risk of triggering immune responses, and the absence of premarket regulatory requirements. However, there are also drawbacks: clinical evidence supporting their effectiveness is often limited, their absorption can be hindered by low lipophilicity, high molecular weight, and interactions with other ingredients, and they tend to be expensive.[3]

Signal peptides	Site of action	Name of peptide	Mechanism of action	Indication as a cosmeceutical
1.	❖ Collagen modulators	Pal-KTTKS	Increases synthesis of types I and type III collagen and fibronectin, elastin and glycosaminoglycan production	Anti-wrinkle Anti-aging
		Pal-GHK or Pal tripeptide 1	Retinoic acid-like activity. Stimulates collagen and glycosaminoglycan synthesis	Anti-aging Anti-wrinkle Firming agent Skin moisturizer
		Trifluoroacetyl Tripeptide-2	ECM stimulation via MMP-1, 3, 9 inhibition Elastase inhibitor	Anti-aging Anti-wrinkle
		Palmitoyl tripeptide-3/5	Mimics thrombospondin 1 tripeptide sequence and collagen synthesis via TGF-β	Anti-wrinkle Firming agent Skin moisturizer Improves stretch marks
		Tripeptide-10	Collagen fibrillogenesis and diameter and placement of collagen fibres. Mimics the sequences of decorin that binds to collagen fibrils	Anti-aging Firming agent Photoprotection
		Peptamide-6 or phe-val-ala-pro-phe-pro	It mimics the action of TGF-β which facilitates maturation of adipocyte precursor cells into contractile fibroblasts. Therefore, this prevents the differentiation of adipocytes	Skin firming agent in treatment of cellulite Anti-aging
		Oligopeptide Tyr-Tyr-Arg-Ala-Asp-Ala	Inhibits enzyme procollagen-C proteinase which converts procollagen to collagen	Skin laxity Anti-wrinkle
		Acetyl tetrapeptide-9/11	Stimulates collagen1 and lumican and syndecan synthesis	Anti-wrinkle Firming agent Anti-aging
		Gly-Glu-Lys-Gly	Induces collagen production	Skin laxity Anti-wrinkle
		Acetyl tetrapeptide-5	Edema reduction by ACE inhibition and collagen crosslinking. It inhibits glycation thereby preventing abnormal crosslinking of collagen fibres	Dermatochalasis or baggy eye lids
		Dipeptide-2/(valyl-tryptophane)	Lymph drainage via ACE inhibition	Baggy eyelids
2.	❖ Elastin modulators	Hexapeptide Val-Gly-Val-Ala-Pro-Gly	Stimulates human skin fibroblasts, angiogenesis, endothelial cell migration and downregulates elastin	Skin laxity Anti-wrinkle
		Palmitoyl oligopeptide	Increases collagen and hyaluronic acid	Anti-aging
3.	❖ Keratinocytes/ epidermal cells	Aquaporin	Increases collagen and hyaluronic acid Increases the thickness of the stratum corneum	Skin moisturizer Wrinkles Anti-aging
		Growth factors (Transforming growth factor VEGFs, hepatocyte growth factors, b-FGF Keratinocyte growth factor and insulin-like growth factor)	TGF-α/TGF-β reversibly inhibit keratinocyte growth, promote keratinocyte migration and are chemotactic for macrophages and fibroblasts promote neovascularization, promote cell growth	Wrinkles Post-skin resurfacing Photoaging
		Heat shock protein 70	Protects cell from apoptosis, aging and UV damage	Wrinkles Anti-aging

			It inhibits aggregation and assists in the refolding of denatured proteins	
		Interferon alpha	Increases the concentration of dendritic cells and CD1a and HLA-DR positive cells	Wrinkles Anti-aging
		Kinetin (natural plant derived growth hormone)	Delays the onset of aging characteristics in human fibroblasts, inhibits keratinocyte growth	Wrinkles Anti-aging
4.	❖ Modulation of melanogenesis	Tetrapeptide (His-D-Phe-Arg-Trp)	Analogue of α-MSH induces melanin synthesis Diminishes DNA damage by reducing the production of reactive	Vitiligo Cosmetic tanning
			oxidative species and enhancing repair of DNA photoproducts	
		Tripeptide (His-D-Phe-Arg))	Analogue of α-MSH induces melanin synthesis	Vitiligo Cosmetic tanning
		Ser-Tyr-Ser-Nle-Glu-His-D-p Phe-Arg-Trp-Gly-Lys-Pro-Val (Melano-Tan-I)	MC1R/α-MSH signalling pathway Induces melanin synthesis Anti-inflammatory	Vitiligo Cosmetic tanning
		Decapeptide	Derived from b-FGF, induces melanin synthesis	Vitiligo
		Acetyl hexapeptide-1	Melanin increase via α-MSH regulation	Vitiligo Tanning Hair repigmentation
		Tyr-Arg-Ser-Arg-Lys-Tyr-Ser Ser-Trp-Tyr (decapeptide-12)	Tyrosinase inhibitor	Melasma, Postinflammatory hyperpigmentation Lentigo Freckles
		Nonapeptide-1	Tyrosinase activation inhibition	Melasma, Postinflammatory hyperpigmentation

RESIDENTS CORNER

PHOTOQUIZ



DR. MEHA TYAGI - MBBS. MD. DNB. MNAMS
Director - Meha's Skin & Hair Clinic
Consultant Dermatologist at Gayatri Hospital,
Ghaziabad, Delhi NCR.

CASE: A 38- year old female presented with multiple dark coloured asymptomatic patches over her face and neck which first appeared on her forehead and then progressively increased in size and number to involve her face and neck over a period of 2 years.

Figure 1- Irregular brown hyperpigmented patches diffusely present over face and neck, slate gray to black multiple patches present over forehead and perioral region

Figure 2a and 2b- Slate gray to black patches involving lateral aspect of face

Figure-3- Slate gray to black patches over perioral region and central part of neck

On Examination- There were irregular brown hyperpigmented patches diffusely present over face and neck. Multiple irregular slate gray to black hyperpigmented patches were present mainly on forehead, lateral aspect of face, perioral region and central part of neck. Examination of palms, soles, oral mucosa, scalp and systemic examination was unremarkable.

What is your diagnosis?
Pigmented contact dermatitis/Riehl's Melanosis

One important history?
Application of fairness creams for the past 6-7 years.

Discussion

Pigmented contact dermatitis (PCD) also known as Riehl's Melanosis is a noneczematous variant of contact dermatitis characterised by blotchy or reticulate slate-gray to brown pigmentation most commonly over face and neck affecting Fitzpatrick skin type IV-VI.[1] It is more common in women in their mid-to late-forties and has a significant psychological impact. Pigmentary changes usually appear gradually and persist for a long time, more noticeable over the lateral aspect of the face than the central part. There can be slight evidence of erythema, pruritus or edema. The underlying mechanisms postulated include genetic predisposition, autoimmunity, ultraviolet radiations, and type IV hypersensitivity.[2] Several contact allergens have been linked to PCD which are found in fragrances, preservatives, hair dyes, kumkum, lipsticks, henna, essential oils and cosmetics.[1] Among the allergens in cosmetics, most common implicated agents are preservatives, fragrances, emulsifiers and vehicles. In the Indian scenario, fairness creams are frequently sought after by women for certain idealised beauty standards leading to their indiscriminate use. The usual components of these fairness creams are lavender absolute, musk mix, thimerosal sorbic acid germall 11, and benzyl salicylates which are the second most common cause of cosmetic-related PCD.[1] Patch testing plays and immense role whenever PCD is diagnosed. Conditions that may simulate PCD are ashy dermatitis and lichen planus pigmentosus. All three entities share several features. Treatment is often challenging. It requires proper counselling regarding causal role of contact allergens in products and the likelihood of persistent pigmentation even after discontinuing causative agents. General methods include avoiding the implicated agent and wearing a broad spectrum sunscreen. Treatment involves topical depigmenting agents and systemic agents depending on severity. Laser therapy shows promising results. For recalcitrant forms, combination of therapies not only increases efficacy, but also reduces adverse events.[3]

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1. *Shenoi SD, Rao R. Pigmented contact dermatitis. Indian J Dermatol venereol leprol2007;73:285-87*
2. *Bhat YJ,UI IslamM,Sultan S. Pigmented contact dermatits: An updated review.IndianJ Skin Allergy. 2024;3:12-20.*
3. *Xu L, Huang Q, Wu T, Mu Y. Research Advances in the Treatment of Riehl's Melanosis. Clin Cosmet Investig Dermatol. 2023;16:1181-89*

CROSSWORD

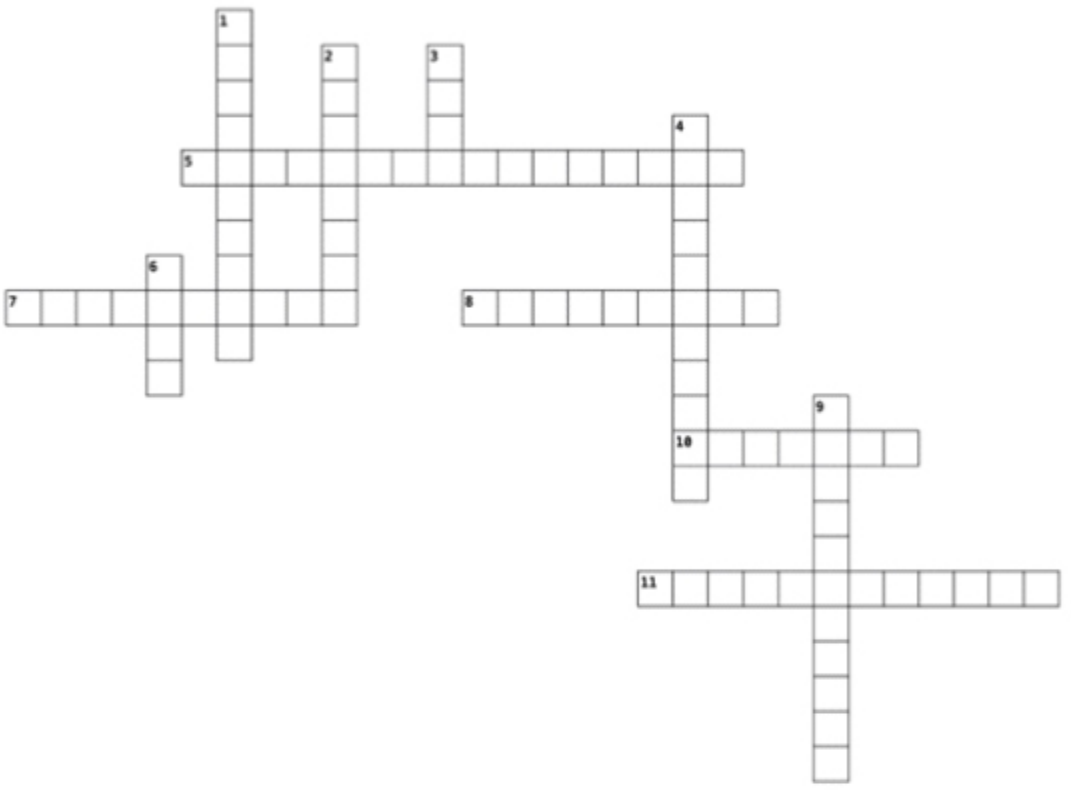
DR SAMPURNA DASH, MBBS
Postgraduate Dermatology Resident,
Lady Hardinge Medical College, New Delhi

ACROSS

5. Bioactive molecules that facilitate transportation of co-factors across skin barrier.
7. Bioactive fragments of extracellular matrix that promote skin repair and regeneration.
8. Retinol alternative with antiaging, antibacterial and anti -inflammatory properties.
10. FDA approved in 2022 for mod-severe glabellar lines
11. Form of Vit B5 used for its moisturising and anti-inflammatory properties.

DOWN

1. Structurally related to AHA with larger size and less irritant properties.
2. Nanovesicle delivery system formed by non-ionic surfactants with longer stability and lower toxicity.
3. Endogenous humectant responsible for hydration of stratum corneum.
4. Novel synthetic retinoid with RAR-γ receptor selectivity with least irritant properties.
6. Essential trace element known for its antioxidant, anti-inflammatory, antimicrobial and wound healing properties.
9. Decreases facial dyspigmentation by inhibiting melanosome transfer from melanocytes to keratinocytes.



EVENTS IN THE FOURTH QUARTER (OCT- DEC) OF 2024

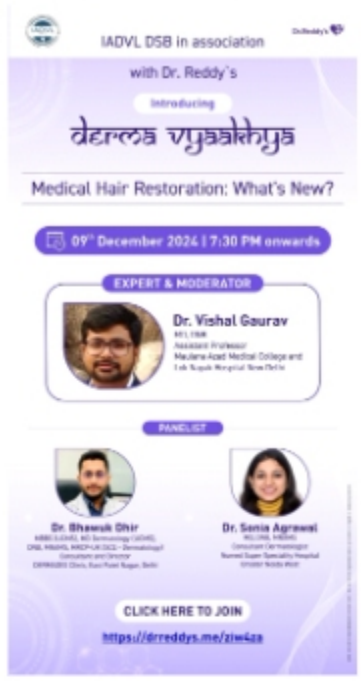
CHALO PATHSHAALA

A national IADVL Presidential initiative- the Chalo Pathshaala was enthusiastically celebrated by the EC members of Delhi State Branch, on 4th December, 2024 at Sarvodaya Kanya Vidyalaya, Punjabi Bagh and MBD Arya Model School, Dwarka.

SIG AESTHETICS

IADVL SIG Aesthetics under the aegis of IADVL Academy and IADVL Delhi State Branch successfully completed another full day hands on Workshop on Excellence in Aesthetic Injectables on 8th December, 2024.
There were around 146 registrations and close to 65 participants. The training was given on upper face toxins and mid face filler injections.

6TH SERIES OF DERMAVYAAKHYA



The Delhi State Branch is continuing its series DERMAVYAAKHYA, a wonderful way for residents, academicians and private practitioners to learn about a topic by expert faculty.

Sixth in the series, the Dermavyaakhya on the theme " Medical Hair Restoration" was aired on 9th December, 2024.

DERMAZONE NORTH & ANNUAL CUTICON DSB 2024

Dermazone North & Annual Cuticon DSB 2024 was hosted by the IADVL Delhi State Branch and was held from October 4th to 6th, 2024 at The Leela Ambience Convention Centre, Delhi under the expert guidance of Dr Somesh Gupta, Professor, AIIMS, New Delhi (Scientific Chairperson) and Dr Deepika Pandhi, Director Professor, UCMS & GTB Hospital, Delhi (Scientific Co-chairperson).

The theme of this year's Dermazone North was 'Navigating the Frontiers of Dermatological Care". The conference was well-appreciated for its unique theme and focus on innovations in management aspects in dermatology.

There were over 450 registrations and the scientific content was appreciated by the delegates. The IADVL National President Dr Manjunath Shenoy, Hony Gen Secretary Dr Bhumesh Kumar Kattakam along with State Presidents & Secretaries of Jammu & Kashmir, Haryana, Uttar Pradesh & Uttarakhand, Haryana and Punjab were among the attendees.

NORTH ZONE PGPDT WORKSHOP

North Zone PGPDT Workshop was successfully conducted on15th December 2024 at MAMC & LNJP Hospital, Delhi. This highly engaging event was attended by 120 delegates.

The workshop featured live demonstrations of over 15 surgical procedures including acne scar surgeries, excision of nevi and cysts, partial nail matricectomy, nail biopsies, vitiligo surgeries and keloid-fillet flap surgery. A team of renowned faculty members including Dr Somesh Gupta, Dr Chander Grover, Dr Niti Khunger, Dr Yogesh Bhingradia and many more experts shared their expertise through hands-on training and interactive sessions.

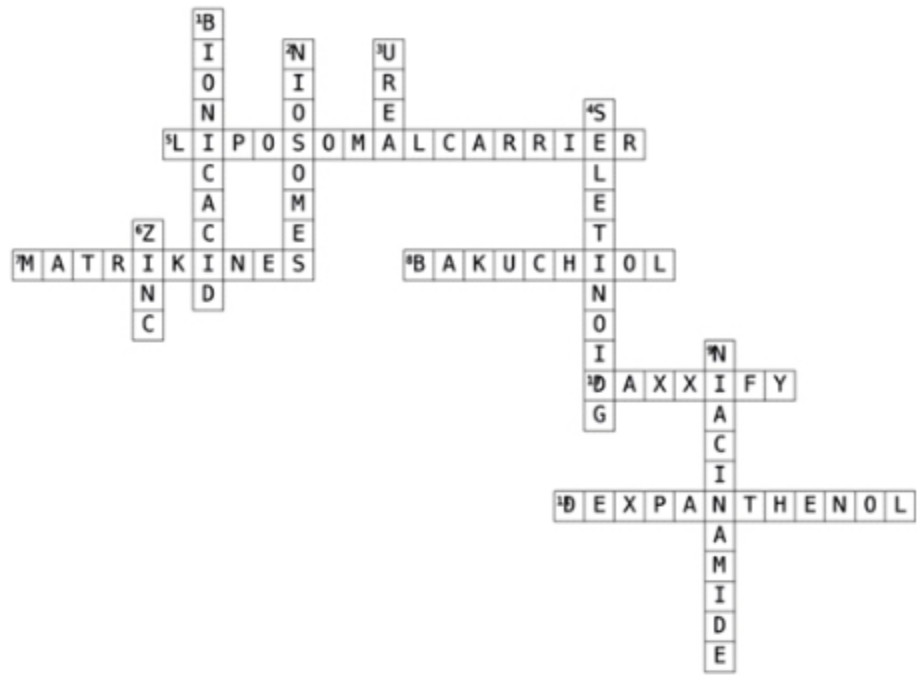
LUNCHEON + CHRISTMAS FATE, ANNUAL GBM

A national IADVL Presidential initiative- the Chalo Pathshaala was enthusiastically celebrated by the EC members of Delhi State Branch, on 4th December, 2024 at Sarvodaya Kanya Vidyalaya, Punjabi Bagh and MBD Arya Model School, Dwarka.

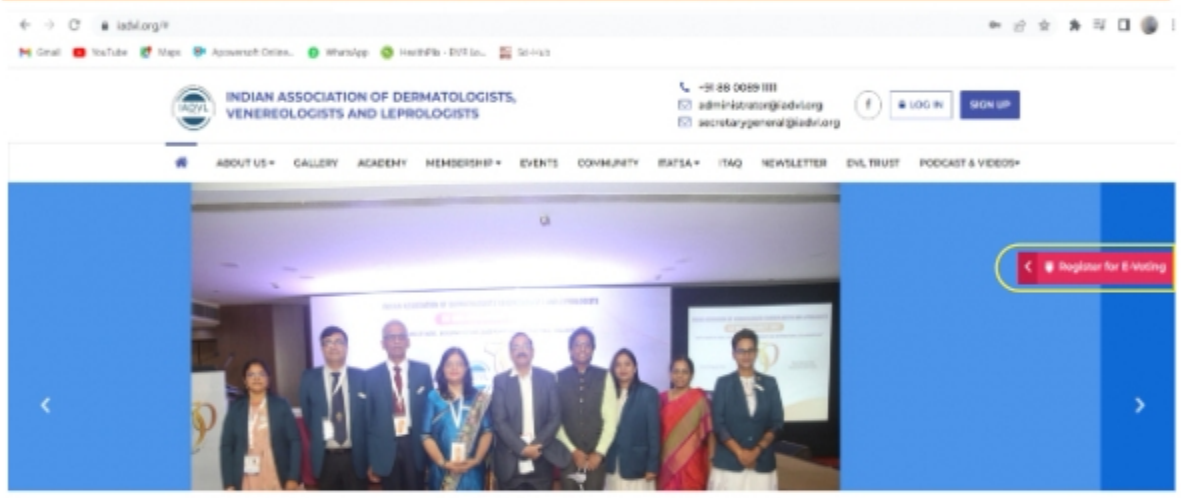
5TH MONTHLY MEET At University College Of Medical Sciences

The 5th monthly meet was held at University College of Medical Sciences on 23rd November, 2024 and was organized by Dr Archana Singal & her team.
Around 45 delegates attended the meeting and were appreciative of the excellent case presentations by residents.

SOLUTION TO THE CROSSWORD



HOW TO REGISTER FOR E-VOTING?



The link for registration for E-voting is their on the homepage of IADVL website.
For any assistance, contact Ms Heena (IADVL HQ) + 91-78380 13829

DVL WELFARE TRUST: OUR OWN SCHEME FOR OUR OWN BENEFIT!

DR. CHANDER GROVER, MD, DNB, MNAMS
Professor, Department of Dermatology and STD
University College of Medical Sciences & GTBH. DELHI;
DVL Welfare Trust Coordinator, IADVL-DSB 2024

DVL Welfare Trust is a unique welfare scheme, initiated by IADVLites, which works for IADVLites. It is targeted at IADVL Life Members & their family. Overall, it is an affordable & accountable scheme, which has proven to be a dependable companion in crisis for our fraternity.

The motto of DVL Welfare Trust is "Help yourself, Help others" and that is the true spirit and design of the scheme, where we IADVL members choose to invest small amounts of money per year to help us as well as our dermatologist colleagues, in the long-term. Keeping this in mind, EVERY ELIGIBLE MEMBER of IADVL, the young and the old, are called upon to enroll through nominal payments, which go a long way in fostering our unity and sense of purpose, apart from securing our own future.

The trust is going strong with 1050 members, as of April, 2024. This is a strong network of members, which strengthens the social security net for all the beneficiaries. The trust was registered at Vadodara, Gujrat in 2011, vide registration no. F/2788/Vadodara. The aim of the trust is to provide financial assistance to the family, in the event of member's death. It also provides comprehensive indemnity cover (upto a maximum amount of 15 lakhs) in the event of litigant situations during the discharge of professional duties of the members. Member benefits increase as the number of Trust members increases. The benefits to the member will continue till death, even though the payments stop after 30 years (for the IADVL Member) or 40 years (for the spouse or children). The profit of the trust remains with us, and can be redistributed among members in the form of various benefits. The trust also aims to educate the members (including clinic, & subordinate staff of the member) to prevent any litigant situation. It also guides them regarding how to deal with litigation, in the event of such a situation.

How do I join DVL Welfare Trust?

IADVL LM can apply and join DVL Welfare Trust by paying Admission Fee (One time, decided as per age) along with advance fraternity contribution (Rs. 2500 initially). The spouse and the children are also eligible to join with payment. The annual membership fee is Rs. 750 (hiked by Rs. 50, every 5 years). If the member chooses to apply for professional Indemnity, the fee is decided as per type of practice (details available on website). Annual legal fee is paid by regular members, depending on the the indemnity coverage (Rs. 1,000 or Rs. 3,000 as per the type of practice). In addition, members pay Death Fund Contribution (DFC) at Rs. 500 per death in the year. The payment system is very user-friendly as payments can be made through cheques, drafts, NEFT, Net banking, Credit or Debit cards by online payment through the website (www.dvlwelfaretrust.org). No dealings are done in Cash.

Benefits offered by DVL Welfare Trust

The scheme offers Social security to its members, and the benefits start ONE year after joining. Upon death of any members, the designated nominee will get monetary help in terms of Rs. 450/- x No. of members. Thus, it is clear that the higher are the numbers of members, higher is the benefit. This is also one way of helping our dermatologist colleagues' family in times of stress. This social security scheme is thus not comparable to any Term Insurance Plan.

The Professional security offered by the scheme covers individual members opting for it. The trust extends its help in all types of cases (civil, criminal, labour, consumer redressal fora, disputes arising out of clinical establishment act, etc.). It also offers educative seminars for its members, which are useful in preventing litigation. The professional indemnity is provided through Legal MD Global Consulting Services Pvt. Ltd. It provides comprehensive risk management services to individuals including coverage for cosmetic procedures, facility for medical centre and unqualified staff coverage (available with additional premium). In addition to the medico-legal support, it also offers weekly medico-legal tips (through SMS), monthly newsletter on medico-legal crisis management support, online medico-legal compliance & audit of practice, and other legal (civil & criminal) support from the legal team. Through the professional protection scheme, the trust helps drafting of legal replies through medico-legal experts. This prevents exploitation by other schemes through periodic hikes in premium of other schemes. It places a vast databank and years of experience in handling medico-legal cases, at the members' disposal.

In contrast, standard professional insurance schemes stay dependent on advocates, introduce periodic hikes depending upon the number of cases and compensation awarded, have limited experience and knowledge in handling medico-legal cases, prefer off-court settlements, asking doctor to confess negligence, and are not bothered about the interest of the profession.

To summarise, DVL welfare trust offers the advantages of very low premiums, and assurance that surplus amount is utilized for members only. Benefits to all members increases with an increase in the membership. Spouses are allowed to join the scheme. It offers the advantage of professional Indemnity. As it is our own scheme, we can expect periodic modifications and improvement, to make it more member friendly from time to time.

Join DVL Welfare Trust TODAY! And make your contribution towards the fraternity! You can access all details at www.dvlwelfaretrust.org or www.iadvl.org. Please feel free to post your queries at dvlwelfaretrust@gmail.com. Better still, you can contact the Chairman, Dr Chetan Patel (9426378078, drcnpatel@gmail.com) or the Vice-Chairman, Dr Vineet Relhan (9910086636, vineetrelhan@gmail.com) and resolve your queries with authentic responses.

Be a member of your own
DVL WELFARE TRUST

BY **IADVL** • OF **IADVL** • FOR **IADVL**

1050+ MEMBERS

JOINED DVL WELFARE TRUST
(RELIABLE PARTNER IN CRISES)

Would you like to be a part of our family?
we will help you...

HELP IADVL TO HELP YOU

Benefits:

FOR SOCIAL SECURITY

Benefits start after ONE year of joining as a member.
Nominee of the member will get help in terms of money Rs. 450/-XN (N is no. of members) the more the members the more the benefits.

PROFESSIONAL INDEMNITY

Rs 1000 to 3000 as annual premium depending on the type of practice.
Rs 15 lac coverage per year

Scan QR Code to join
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