



IADVL

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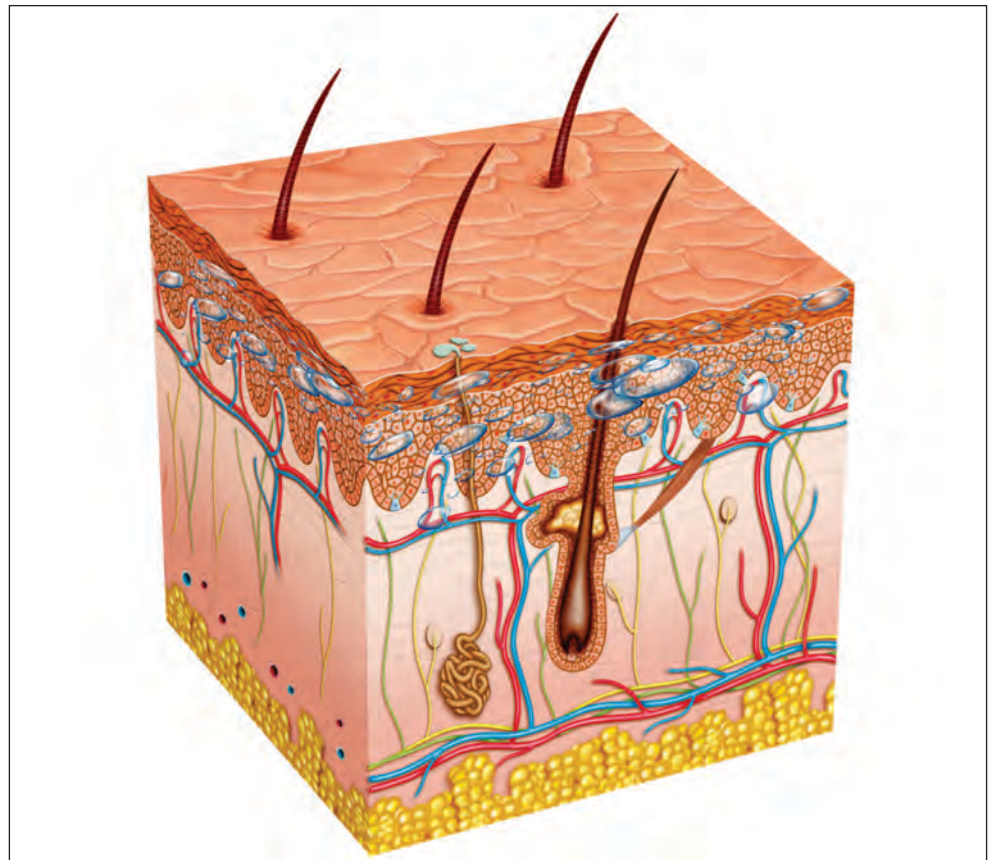
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Foreword



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Hydration is an important aspect that influences physical and mechanical properties of the skin. An aesthetically appealing, well hydrated skin reflects its true health. A well hydrated skin is characterized by good turgor, resilience and pliability thus ensuring that the skin stays soft, strong and pliable enough to tolerate deformation from physical stresses and strains.

Changes in hydration lead to a change in the molecular arrangement of peptides in the keratin filaments and a structural change subsequently, leading to alterations in permeability and integrity of all its layers, ultimately affecting its function as an effective transport barrier as well as the loss of its aesthetic appeal. Thus, aging which affects hydration leads to dry, rough, inelastic, wrinkled skin which not only needs address for its aesthetics but also for its compromised functions.

Addressing hydration of the skin is hence an essential component of aesthetic practice, however, it is seldom discussed.

SIG Aesthetics is happy to bring its newsletter on the theme of 'Skin hydration'.

The following articles by members of the SIG Aesthetics (IADVL Academy) elaborate on these various approaches to improve skin hydration some of which affect it directly and some indirectly. We through this newsletter endeavour to provide you insights into these approaches

Cosmeceuticals for Skin Hydration

Dr. Vineeta Joshi, Dr. Abhay Talathi

Cosmeceuticals can be defined as topical preparations that are sold as cosmetics but have performance characteristics that suggest pharmaceutical action. Albert Kligman coined this term in 1980.¹

While the concept of skin care regimens and cosmetics with biologically active ingredients is not new, the therapeutic positioning in a dermatologist's prescription has changed over the last few years. There are various categories of cosmeceuticals used for various indications in dermatology practice; vitamins, antioxidants, hydroxy acids and moisturizers to name a few.

A cosmeceutical has to have certain characteristics. It should be usable on normal or near normal skin. It should be able to repair minor skin defects and ailments and have a very low risk profile.²

Hydration for Normal Skin:

Maintaining an attractive and glowing skin is of great value in happiness and positive self-image of our patients. This can be achieved by keeping the skin well hydrated. Hydration is of utmost importance because it gives the skin desired youthfulness, glow, elasticity and a healthy and supple look. Other than this visible parameter, hydration level also affects molecular parameters, enzyme activities and cellular signaling within the epidermis. Thus a well hydrated skin has better defense status against external assaults than dry skin.

Stratum corneum is an excellent barrier the superficial layer is readily disturbed by low humidity, wind, sun, detergents etc. resulting in dry skin. Dry skin is not just skin that lacks water, it is dysfunctional, feels rough, looks dull because of scattering of light from an uneven surface and is thus more prone to irritation and infections.³

Moisturizers repair the upper layer of stratum corneum but cosmeceuticals with moisturizing properties penetrate deeper to repair the barrier.

Main functions of such cosmeceuticals is to retain water in the stratum corneum, reduce transepidermal water loss, increase natural moisturizing factors in the stratum corneum and regulate the function of intercellular lipids. Thus these products normally contain a combination of emollients, humectants and occlusive agents.

Common Moisturizing Agents:

Emollients fill the crevices between fragmented collections of desquamated corneocytes. E.g.: propylene glycol, jojoba oil, dimethicone, isopropyl myristate etc.

Humectants attract water from the dermis into the outer epidermal layer, as well as from the environment if humidity is more than 70%. Eg: Hyaluronic acid, sodium lactate, ammonium lactate, urea etc.

Occlusive agents form a hydrophobic film on the skin surface and retard evaporation and water loss. E.g.: cetyl alcohol, stearyl alcohol, squalene, paraffin

Choosing a right moisturizer:

Choice of a moisturizer will depend on various factors like type of skin, part of the body which needs to be moisturized, season, time of the day when it is to be used and associated skin ailments.

Lotions, especially non comedogenic preparations, are suitable for application on face and hairy areas. Creams are better suited for dry type of skin when it comes to non-facial body parts. More greasy creams or ointments are needed in case the skin is xerotic due to age or other coexisting skin diseases.

Lotions or gels would be a better choice for summers while thicker preparations should be chosen for application during winter.

Use of Moisturizers alongside procedures:

In the era of newer aesthetic procedures being performed in a dermatologist's office, the importance of well hydrated skin pre and post procedure needs to be emphasized for optimum outcome. Procedures like chemical peels, microdermabrasion, microneedling, lasers, non-ablative radiofrequency treatments and minor skin surgeries, are greatly benefitted by pre and post procedure moisturization where pre procedure priming and post procedure repairing of skin is crucial.

Post procedures adequate hydration with home use cosmeceuticals will ensure faster recovery of the disrupted epidermis and ensure better results.

Skin hydration and therapeutic benefits:

It has been proven that skin with adequate water content responds better to any therapeutic agent applied externally.³

So, hydrating the skin with moisturizers will give a better treatment results in any dermatological condition.

Newer Generation Moisturizers:

With advancement of scientific knowledge and better manufacturing techniques a number of new agents are being used for skin hydration, They offer an advantage during personal care as well as disease management.⁴

- 1) Ceramide Complexes : Usually complexes containing ceramides 1,3,6 are being used. Ceramides significantly reduce transepidermal water loss, help to repair and enhance barrier functions of skin. Ceramide deficiencies are also linked to a few skin diseases like atopic dermatitis and such moisturizers are greatly beneficial
- 2) Phosphosphingosine: This stimulates release of Natural Moisturizing Factors thus directly improving skin hydration
- 3) Colloidal Oatmeal : Offers occlusive, antipruritic and anti-inflammatory properties
- 4) Zinc PCA: Also offers anti-acne benefit
- 5) Oral Moisturizers: In recent times ceramosides derived from hydrolyzed wheat protein are used in the form of oral supplement to increase water content of skin.

Like with any other formulation, using cosmeceuticals for skin hydration has some advantages and disadvantages.

Advantages :

1. Easily available
2. Choice of formulations
3. Cosmetically elegant
4. Easy to use
5. Very low risk profile

Disadvantages :

1. Not personalized
2. In rare cases , may cause irritant dermatitis
3. Choosing a wrong formulation may lead to side effects like acne

Since advantages score over disadvantages, cosmeceuticals are widely used for skin hydration.

Use of skin hydration in Aesthetic Practice:

- 1) Moisturization is an important step in skin care and everyone should be prescribed a moisturizer.
- 2) The best time to use moisturizer is immediately after washing face. The best frequency is twice a day in authors opinion.
- 3) Today we have a wide range of skin hydrating creams and a correct choice can be made based on patient's skin type and the medical and procedural treatments planned and received by patients.

Practical Tips to choose correct moisturizers: In authors' opinion we need to consider following factors to choose a right moisturizer for patients;

- 1) Skin type: Gels can be preferred for oily skin and cream or occlusive emollients for normal to dry skin
- 2) Area of application : Lotions are preferred over big body parts
- 3) Season/ Time of application and geographical climate: Oil in water based moisturizers can be used for patients in humid climate. For Single morning time application combination of moisturizers and sunscreen can be used.
- 4) Also consider coexisting medical treatments before choosing the correct formula
- 5) Cost is always an important aspect as patients have to use them for a very long time

Choosing a properly balanced and cosmetically elegant moisturizer can repair the skin insults that take place on a microscopic level thus can prevent further skin damage.

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Skin Boosters with Help of Fillers

Dr. Gulhima Arora, Dr. Prateek Sondhi

Introduction

A good quality skin is a marker of good health, vibrance, youth, vitality and even wealth! Soft tissue fillers are one of the most common non-surgical aesthetic procedures performed. Usually, and initially, the role of fillers was to volumize and contour. These can be achieved if the filler material is deposited in the deeper planes. However, lot of interest has now been generated in using fillers to improve the quality of the skin. They have been termed as “skin boosters”.

Discussion

As we grow older many changes take place in the dermis. The collagen fibrils start to denature. The fibroblasts reduce in number and are not able to regenerate collagen at the same rate as it being degenerated. There is also reduction in the hyaluronic acid (HA) content. All these factors affect the aging of skin.

The epidermis and dermis act as a single unit. The dermis provides a foundation on which the epidermis rests. Thus, a treatment regimen which targets both the epidermis and dermis will give better result in rejuvenation rather than a treatment working on a single layer.

Quality of skin depends on certain parameters. They are elasticity, texture, hydration and even skin tone. Elasticity refers to the ability of skin to stretch on application and then come back to its original state on removal of the deforming force. Hydration is the amount of water content in the skin. This basically reflects the integrity of underlying collagen and elastin. It is a measure of hyaluronic acid which can hold water many times its weight, around 1000 times, thus making the skin soft, supple and tight. With significant ultraviolet rays exposure, the degeneration of elastin fibres occurs known as elastosis. Clinically it translates into rough, leather like skin. With age hyaluronic acid is reduced in quantity. This reduces the elasticity and hydration of the skin.

"Skin boosting" can be done with diluted concentrations of abobotulinum toxin A, conventional HA fillers, HA skin boosters or a combination of these¹.

Amongst these, hyaluronic acid is the most popular product due to its natural abundance and biocompatibility. It is well tolerated. It has now been shown than addition of hyaluronic acid causes stabilization of collagen structure and upregulation of fibroblasts to produce more collagen and elastin. It helps to maintain the collagen and elastin in a proper configuration, being present in the periphery and interface of collagen and elastin.

The advantage of this molecule is that it can be produced in many ways which can change its rheological properties. Few generalizations can however be made. Hyaluronic acid can exist in various crosslinked chains. The individual chain can have variable lengths. Smaller chains have more free available space to attach to water molecules and can thus hold more water. Similarly, if the adjacent chains have more cross linking then there is lesser potential to join with water molecules. But, this makes the product firmer, more elastic and less malleable. Thus, an ideal filler to be used as a skin booster should have smaller chains, less cross linking and reduced density of hyaluronic acid. These properties will help to deposit the product at the level of dermis². There is no exact standardization of products available in the market. They differ in their manufacturing process with patent technologies e.g. VYCROSS, NASHA (Non-Animal Stabilized Hyaluronic Acid), CPM (Cohesive Polydensified Matrix). They can be termed as biosimilars as they vary in their rheological properties, method of preparation, agent used for cross linking, size and density of individual hyaluronic acid molecules, cohesivity, elasticity, plasticity and longevity. HA can be easily combined with lidocaine and carboxytherapy³.

Skin boosters are usually hyaluronic acids of low molecular weight which are deposited in the dermis for the purpose of skin rejuvenation. They help to improve various parameters like hydration, elasticity, roughness. They are injected into the skin to give a more nourished look by re-densification of the skin. They come in pre-filled syringes, with or without lidocaine mixed in them.

Methods of Administration

Since the products differ in their rheological properties, each has its own regimen for use. The density of hyaluronic acid varies from 12-20 mg/ml⁴. Juvederm Volite™ has density of 12 mg/ml whereas Restylane vital™ and Belotero Hydro™ have a concentration of 20 mg/dl. Most of them contain lidocaine for anaesthetic effect. For some products monthly injections are given for 3 months and the benefit is expected to stay up to 6 months². Other products require a single session and effect is expected to last for 6-9 months⁵. The filler must be deposited in the reticular dermis. This is crucial as superficial deposit of product may result in persistent irregularity of skin and if the product is injected deep into subcutaneous tissue it will work as a volumizer rather than a skin rejuvenator or “booster”. The dosage may vary from 10 µl to 50 µl per injection site. The consensus is to make small grids in the area of injection and massage the product after injection. Each micro depot is supposed to cover an approximate distance of 1cm². The filler may be administered by a thin 30-32 G needle, cannula, or an automatic injection machine. The preferable mode of injection is through needle except the under-eye area and dorsum of hands where cannula may be better option (Fig 1)

Indications

Skin boosters can be used for

- facial rejuvenation,
- hand rejuvenation,
- lip plumping,
- perioral and periorcular rejuvenation
- improving the texture, elasticity and hydration and crepiness of skin
- neck, décolletage rejuvenation
- improving fine lines and wrinkles
- boosters can help to reduce the perceived age of the skin.

Non-Aesthetic uses of skin boosters

Skin boosters can be used for improving dry skin e.g. atopic dermatitis. They can also be used for superficial acne scars.

Contraindications

- Pregnancy
- Lactation
- Age below 18 years
- Hyaluronic acid fillers should not be used in patients who have allergy to amide anaesthetics or streptococcus species².

Objective methods to measure skin rejuvenation

1. Cutometer – Measures change in gross elasticity of skin
2. Corneometer – Measures skin hydration
3. Glossymeter – Measures skin radiance
4. Ultrasound Scanner (DUB, Taberna, Germany) – Measures skin thickness and density
5. Phaseshift Rapid In-vivo Measurement of Skin (PRISMOS, GFM, Berlin, Germany) – Can make 3D model of skin and study facial wrinkles, skin roughness etc.

Side effects

Overall, the adverse event rate varies from 5-80%². Most of the side effects are minor and include irregular surface or

lumpiness, persistent erythema for 5-7 days and bruising and swelling. Long term side effects may be granuloma or nodule formation.

Complications

Injector related

- Lumps due to superficial deposition of the product
- Vascular events, if wrong plane.

Product related

- Hypersensitivity to HA or a constituent of the booster

Tips and Tricks

- A proper knowledge of anatomy
- Skill of depositing the injection in the right plane
- Marking is advisable to ensure equal and even distribution of the contents of the syringe.

Limitations

Lack of standardization across products makes it difficult to compare them with each other. Lack of standardized, objective criteria to measure improvement in various skin parameters like roughness, hydration, elasticity and turgor is another drawback. As most trials are sponsored by the manufacturing companies and results heavily rely on the subjective improvement by the investigators and patients which may be biased. There is no fixed protocol in place

Conclusion

Skin boosters offer a unique advantage as they help in boosting the skin from 'within' in comparison to other therapies which target from outside. They may also help in reducing dryness in patients with atopic dermatitis and reducing erythema in rosacea. Since the procedure is quite simple with a very good safety profile, their use should be encouraged. Since dermatologists are generally the first people whom patients approach for their skin concerns, they should be well versed in this procedure to provide holistic skin care to their patients.

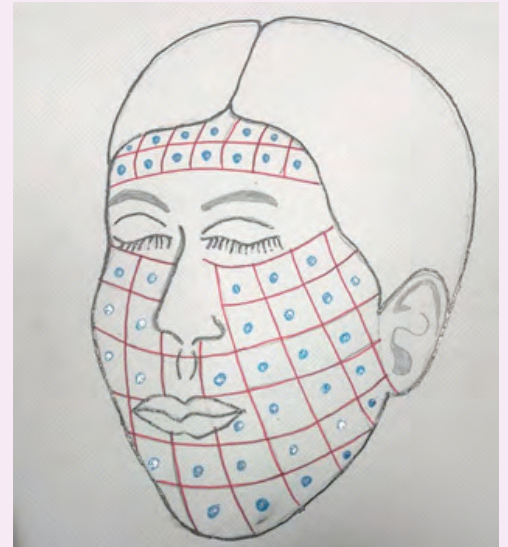


Fig 1. Figure depicting formation of grids, which can help in accurate delivery of filler. Generally 20 graduations are present in a syringe. 20 such grids can be made which each injec

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Mesococktails and Mesoproducts in aesthetic dermatology

Dr Rajat Kandhari, Dr Divya Sharma

Introduction

Mesotherapy is a minimally invasive process involving multiple intradermal or subcutaneous injections of a mixture of compounds (plant extracts, nutrients, enzymes, homeopathic agents, pharmaceuticals, vitamins, and other bioactive substances) to treat localised medical and cosmetic conditions.¹

The basis of mesotherapy – Why do we need it ?

The injection technique of mesotherapy allows for:

- a) Large molecule penetration into the superficial layers of the skin.
- b) The skin acts as a natural time-release system – Slow clearance of superficially delivered drugs by the general circulation results in gradual penetration of the drugs into the dermis / target area resulting in a longer duration of action, decreased dosing and faster outcomes.
- c) Mechanical stimulation – multiple pricks to the skin result in improving microcirculation, epidermal turnover, stimulation of collagen remodelling which further results in imparting improved tone and texture to the skin.
- d) Minimal downtime and pain

Applications in dermatology

While the indications for mesotherapy in aesthetic dermatology are numerous, covering each of them is out of the scope of this review. We would be focusing on the popular and more effective indications. (Table 1)

Applications in dermatology	Popular indications in aesthetic practice
Contouring - lipodissolve, body contouring and cellulite	Injection lipolysis for submental fat.
Skin-rejuvenation/glow, lift, pigmentation	Mesolift, Mesoglow, Microbotox and mesolightening for hydration, textural improvement, fine lines and glow.
Hair-telogen effluvium, androgenetic alopecia	Commonly employed as an add on treatment for both , telogen effluvium and / or androgenetic alopecia.
Treatment of melasma, pigmentary demarcation lines, stretch mark	

Procedure and injection techniques

While there are no standard guidelines for formulation or frequency of treatments, the differing techniques are mentioned below. The basic equipment required for mesotherapy is illustrated. (Figure 1)

- a) Point-by-point into the dermis
- b) Nappage - injections penetrate to a depth of 2–4 mm and are delivered at an angle of 30–60°
- c) Papular technique - reagents injected at the dermo–epidermal junction and allowed to perfuse deeper. (Figure 2)
- d) Intraepidermal technique
- e) No Needle Mesotherapy (NNM) via electroporation is popular as it is completely painless, allows for no bruising, erythema or swelling. Moreover, the materials penetrate deep, results in immediate response and is cost effective. ³



Fig.1



Fig.2

One may employ needles (30G, 12mm) or a mesogun for administering the meso solutions as per convenience and injector preference. (Figure 3)

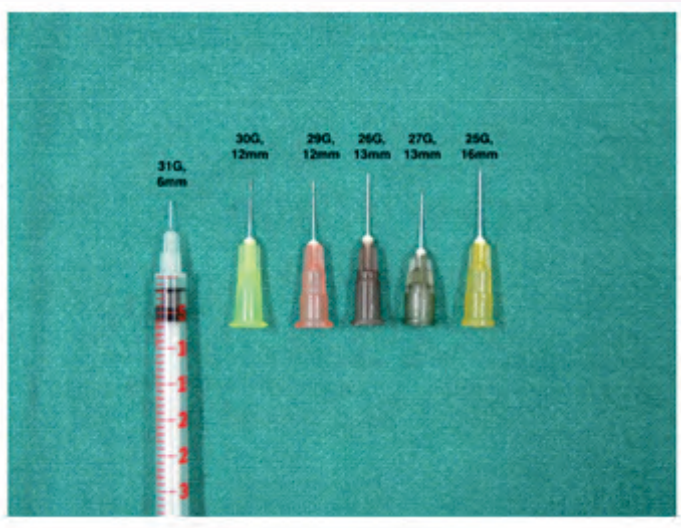


Fig.3

Certain views which have been discussed in differing publications regarding the injection technique:⁸

- Angle of injection into the skin – Usually 30-60 degrees, perpendicular for certain indications. (Figure 4)

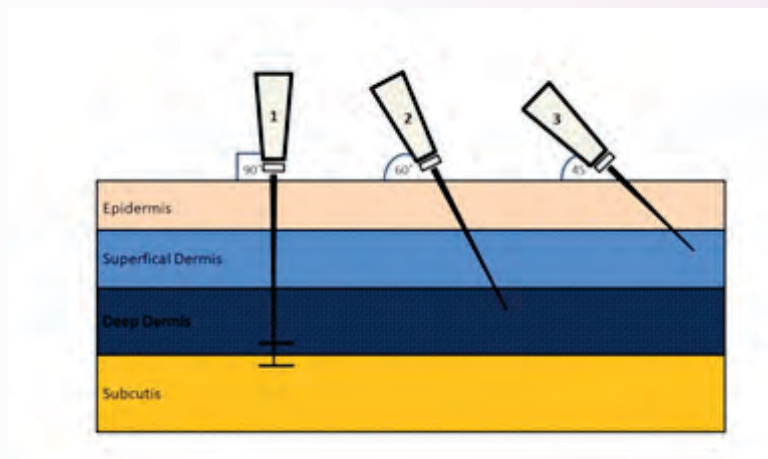


Fig.4

- Depth of needle - Should penetrate no more than 4mm.
- Distance between injections - The injections to the target area should be at a distance of 1cm (at the minimum) and 4cm (at the maximum).
- Frequency of injections - weekly or monthly, four to ten sessions in varying reports

Common ingredients and mesosolutions/cocktails

a) Agents for bio-revitalisation

Hyaluronic acid (HA) – The popularity of HA as an agent for mesotherapy stems from its large molecular size and inability to permeate the skin barrier to reach the dermis. HA plays an important role in the hydration of the extracellular space due to its ability to attract water molecules and also it creates the physiological conditions in the extracellular matrix for proliferation, migration and organisation of dermal cells. There is ample data to suggest the clinical and histological efficacy of HA based mesotherapy, in attaining increased density of dermal collagen fibres by fibroblast activation, thereby improving skin hydration, firmness and viscoelastic properties.^[6-8]

- *Mesolift*

A cocktail of a multivitamins, plant stem cells, antioxidants and non-cross-linked, high-viscosity hyaluronic acid which hydrates the skin boosting the overall smooth appearance of the skin is known as “Mesolift”. HA has also been combined with SYN AKE which claims to blocks the neurotransmission in the nicotinic acetylcholine receptor and other hydrating agents (Meso-cheek lift).

HA at different strengths is combined with vitamins, plant stem cells and other ingredients in varying formulations available in the Indian market. (Table 2

Formulations available in the Indian market

1. 30- 100 mg Hyaluronic acid (in sodium salt form), 5% mannitol, DMAE, Pro-collagen peptide, Argireline, Leuphasyl, Marine collagen, Silicium, Vitamins B1-B6 (Worlddermic, Spain, 5ml vials x 5)
2. Hyaluronic acid 40mg, vegetal stem cell booster, vitamins A, B5,B3,B6 (Pluryal Mesoline Refresh, Luxembourg, 5ml vials x 5)
3. Hyaluronic Acid (Inno-TDS, Innoaesthetics, Barcelona, Spain, 10ml vials)
4. Meso cit TGF beta 2 / EGF – TGF beta 2/ EGF with LMW HA, zinc and amino acids, copper, panthenol, caproyl tetrapeptide -3, organic silicon, vitamin C. (Medi Derma, Sesderma Laboratories, Barcelona, Spain, EU)

Dimethylaminoethanol (DMAE) : Precursor of Phosphatidylcholine (PPC) which converts choline to acetylcholine (Ach) and thus causes muscle contraction leading to muscle firmness (mainly for lower face). DMAE also enhances proteoglycan synthesis. It may be combined with following ingredients:

- Silicium and DMAE– It is an essential trace element which interacts with collagen, elastin fibres enriching the proteoglycans of the skin. They help in beating muscle fatigue and promote wound healing.
- DMAE and Dipeptide Carnosine – A derivative of Histidine which is known for increasing skin firmness, also known as the Meso eye lift

Peptides used in skin rejuvenation include

1. Acetyldcapeptide-3: reduces and prevents lines and wrinkles by actively generating new skin cells.
2. Decapeptide-4: for anti-aging and wound healing.
3. Copper tripeptide-1: improves blood circulation in the skin.
4. Oligopeptide-24: helps in collagen remodelling.
5. Tripeptide-6: hydrates dry skin and maintains its optimum moisture balance. These biopeptides are an important component of mesolift, mesoglow, mesocellulite and mesohair and mesosculpting.

b) Agents for injection lipolysis

Phosphatidyl choline (PC) and deoxycholic acid (DCA) are the most widely used agents for lipolysis, particularly submental fat (chin jowls, double chin), eyepad fats and other localised fat pockets. Their use in minimally invasive body contouring is also becoming popular when combined with other modalities. Due to its viscous nature, at times PC is compounded with, an emulsifying agent, deoxycholate, which is shown to independently cause lysis of the adipocytes.^{9,10} The injectable adipocytolytic drug deoxycholic acid (DCA) is component of human bile acid, the first agent to get approved by the FDA for the reduction of submental fat (SMF). Since, mesotherapy involves intradermal injections and injection lipolysis requires the agents be delivered to the subcutaneous tissues a detailed discussion of the agents is beyond the scope of this manuscript. The preparation and protocol have been illustrated. (Table 3)

Table 3 - Preparation, protocol for DCA injection for submental fat

- 1 mL of DCA solution drawn into a syringe using a large bore needle e.g. 21G
- After aseptic measures, pinch the subcutaneous fat between 2 fingers of the non dominant hand & place injections perpendicular to the skin upto half needle depth (13mm, 30G needle)
- 0.2-mL injections (maximum of 10 mL per treatment session).
- Minimum of 4-6 treatment sessions (one per month)

Available formulations In the Indian market

GeoLysis - deoxycholic acid (10mg/mL). (*Simildiet SL Laboratories, Cadena, Zaragoza, Spain, EU*)

Fat X – deoxycholic acid 10mg/ml with plant extracts (*TNS, South Korea*)

Draining PPC – phosphatidyl choline 5% + DCA 2.5% (*Inno TDS, Innoaesthetics, Barcelona, Spain, EU*)

Pluryal mesoline Bodycontour – PPC + DCA (*Pluryal Mesoline, Luxembourg, EU*)

Adverse effects reported in literature

1. Suppurative noninfectious panniculitis after mesotherapy has been reported from injection pressure, local trauma, or injected substance types, especially high doses of phosphatidylcholine or deoxycholate¹¹.
2. Infection is the most commonly reported complication. Around 200 infections have been reported to be associated with mesotherapy caused by rapidly growing atypical mycobacteria¹².

c) Meso for pigmentation, brightening and glow

Mesoglow

Primarily containing glutathione, ascorbic acid as main ingredients and kojic acid, glycolic acid, pyruvic acid, and plant extracts. Usually done at weekly or fortnightly intervals for 4-6 sessions. Available formulations are illustrated. (Table 4)

Table 4- Available formulations for brightening and glow

Pluryal shine – Vitamin C, kojic acid, phytic acid, pyruvic acid, morbus alba extract (*Pluryal mesoline, Luxembourg, EU*)

Glutathione and ascorbic acid (*Worlddermic, Spain, EU*)

Meso CIT even skin tone – Human growth hormone (HGH), Tranaxemic acid, 4n butyl resorcinol, arbutin, vitamin C, copper, panthenol, LMW HA, Zinc and amino acids. (*Medi Derma, Sesderma Laboratories, Barcelona, Spain, EU*)

d) Mesobotox

Mesobotox or Microbotox involves delivery of botulinum toxin in superficial, uniform sized, droplets in the dermis for the best outcomes. The amount or dilution of botulinum toxin is crucial as too little will result in inadequate results and an unhappy patient and too much will result in a large droplet size which would be delivered in the wrong plane resulting in undesirable outcomes. A luer lock syringe (if available) always works better as the standard insulin syringe (31G) results in frequent leakage / wastage of the solution.

Microbotox may be used for the following indications, although it is particularly effective in treating neck and lower face rhytids.^{11,12}

1. Dynamic forehead lines
2. Glabellar lines
3. Lateral canthal lines
4. Lower Face
5. Neck lines (Platysmal bands)
6. Open Pores
7. Acne and acne scars
8. Keloids
9. Hyperhidrosis

There are different ways of preparing microbotox solutions and this may depend on injector preference and the area being treated. (Table 5)

Table 5 - Dilution of Onabotulinumtoxin A for preparing mesobotox
100 units of Onabotulinum toxin type A with 10ml of normal saline - 10 units of botox per ml
100 units on Onabotulinumtoxin A with 5.0 mL saline and then directly drawing out 1 mL of the solution into the syringe. (20 units/ ml)
100 units of Onabotulinumtoxin A with 2.5ml saline and further diluting it with normal saline e.g. 24 units, i.e 0.6 -0.7ml of standard dilution botox is further topped up with saline providing 24 U in 1 ml solution.

The Injection technique requires use of a 30- or 32-G needle, with the bevel pointed downward and parallel to the skin, raising a small blanched bleb. 0.05ml or 2 units in numerous small droplets (10-20) or 0.01 mL of the solution should be injected per point at 0.8 to 1.0 cm intervals into the dermis or the interface between the dermis and the superficial surface of the facial muscles in a grid like fashion.

e) Meso for hair loss

Meso for hair loss claims to improve hair quality, moisture, prolong the anagen phase, improve microcirculation and nutrient supply, and inhibit 5 alpha reductase. Despite the glaring scarcity of controlled published studies for mesotherapy in hair disorders, injections of minoxidil, finasteride, dutasteride, saw palmetto, biotin, panthenol, hyaluronic acid, taurine and multivitamins are used in the treatment of alopecia. Mesotherapy for hair loss maybe combined with low level laser light therapy (LLLT), platelet rich plasma (PRP) and / or recombinant human growth factors in the same or different sessions for more optimal outcomes along with standard medical therapy. The available formulations are illustrated. (Table 6)

Table 6 - Available formulations in the Indian market for meso hair
<i>MesoHair</i> - Dexapantenol (panthenol), Leuphasyl (peptide), Algisium C, Gotu kola, Metylsilanol mannuronate, Biotin, Niacinamide, Riboflavin, Ascorbic acid, Glycerin. (<i>Worlddermic, Spain, EU</i>)
<i>Hair revival</i> - Aminophylline, Glutathione, Chondroitin Sulfate, ATP, Peptides, Hair Growth Factors, Adenosine, Zinc, Pyridoxine (<i>Inno TDS, Innoaesthetics, Barcelona, Spain, EU</i>)
<i>Pluryal Hair</i> – caffeine, copper peptides, plant stem cells, B vitamins, amino acids, hyaluronic acid ((<i>Pluryal Mesoline, Luxembourg, EU</i>)
<i>Nanomeso Seskavel Mulberry</i> – morus alba, nicotinic acid, panthenol, pyridoxine, zinc (<i>Medi Derma, Sesderma Laboratories, Barcelona, Spain, EU</i>)
<i>Meso Cit hair care</i> – Fuji mulberry root extract, follistatin, LMW HA, zinc, copper, panthenol, organic silicon, vitamin C (<i>Medi Derma, Sesderma Laboratories, Barcelona, Spain, EU</i>)

Contraindications for mesotherapy

- Pregnancy
- Insulin-dependent diabetes
- History of strokes
- History of recent cancer
- Thromboembolic phenomena
- Patients on medications like aspirin, warfarin, heparin etc.

Adverse effects

Despite the involvement of multiple injections in mesotherapy, the main reason cited for less frequent untoward effects is the much less dosage than one large dose used in modern medicine.

- Suppurative noninfectious panniculitis after mesotherapy has been reported from injection pressure, local trauma, or injected substance types, especially high doses of phosphatidylcholine or deoxycholate¹¹
- Hypersensitivity reactions like immediate or delayed (especially to hyaluronidase, collagenase), pruritic, maculopapular rash distant from the treated area (phosphatidylcholine allergy) have also been reported.
- Bruising, edema and tenderness. Swelling and pain after only deoxycholic acid injection may last up to 10–14 days, whereas the discomfort after injection of the combination of deoxycholic acid and phosphatidylcholine usually lasts for up to less than a week.
- Marginal mandibular nerve injury: This is due to injecting a lot of deoxycholic acid close to the nerve. Clinically, it may result in asymmetrical smile. It can be avoided with correct injection technique in most of the individuals.
- Pigmentation problems include post-inflammatory hyperpigmentation and urticaria pigmentosa
- Skin necrosis and / or ulceration
- Liver toxicity and demyelination of nerves - reported with large doses of PPC
- Atypical mycobacterial infections (rare)
- Vagal symptoms

- There has been no reports of carcinogenicity mentioned in the literature with mesotherapy as of now.
- Mesotherapy for hair, has demonstrated alopecia in two. Histological features were consistent with non - cicatricial alopecia similar to anagen effluvium¹⁵.
- Multifocal scalp abscesses leading to cicatricial alopecia has been reported with mesotherapy for hair loss¹⁶.
- Complications with microbotox are usually due to incorrect droplet size and depth of injection. If the injections are delivered subdermally and the droplet size is larger than what has been recommended, the microbotox will diffuse into the thickness of the underlying muscle creating total paralysis. This may result in a stiff immovable brow, a sensation of heaviness and a brow ptosis. One should be particularly judicious in the use of neurotoxin in this area and should document any pre- existing brow or lid ptosis. Diffusion into the sternocleidomastoid muscle leads to weakness in movement of the neck and diffusion into the depressor anguli oris, risorius, or depressor labii inferioris while using microbotox in the lower face can cause asymmetry of the face and a lopsided smile. Diffusion into the orbicularis oculi particularly in patients with pre-existing skin laxity results in enhanced eye bags or festooning, lid laxity, a swollen waterlogged appearance, and the “inanimate lower eyelid.” Due to a lower neurotoxin concentration, these complications usually subside within 2–3 weeks.

Conclusion

Despite the numerous formulations available for various indications in meso solutions, there is still a scarcity of quality RCT's and controlled trials to determine its efficacy and safety. While mesotherapy is here to stay we urge dermatologists to practice caution while choosing the right product for the right patient.

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Effect of PRP on Skin hydration

Dr. Vinma Shetty, Dr. Rashmi Sharma

Introduction

The advent of platelet rich plasma has escorted major spin in the field of medicine. The wide use of this therapy in diverse fields like dentistry, surgery, orthopaedics and dermatology has been widely studied in respect to its wound healing properties. Platelet rich plasma (PRP) means "abundant platelets that are concentrated into a small volume of plasma".¹

PRP is an autologous preparation comprising multiple fundamental growth factors by dint of platelets alone stored as alpha granules in platelets and plasma proteins. The various growth factors such as platelet-derived growth factor, transforming growth factor- β , insulin-like growth factor, vascular endothelial growth factor and epidermal growth factor. The activation of growth factor is elicited on contact with thrombin, collagen and calcium chloride. This concoction of growth factor is salient in modulation of tissue repair and regeneration, offered by release of supraphysiological amount of growth factors concentrate succeeding centrifugation process.²

As a contrivance of PRP reported to activate and stimulate cell proliferation and collagen synthesis, minimize the wrinkles, and improve the overall skin appearance.³

Although the ideal concentration of platelets in PRP therapy is not identified, some studies have reported that concentrations 4 to 6 times more than the whole blood are sufficient to provide the benefit of PRP therapy.⁴ The major advantage of this treatment is autologous, economic, easy production, no complex equipment needed and minimal invasion.

Preparation:

PRP is prepared by automated devices and manual double spin method. Consequently, in the double spin technique first spin also called as hard spin leads to segregation of the platelet poor plasma (PPP) from the red cells and platelet rich plasma (PRP). The second spin also called as soft spin segregates the red cells from the PRP. The process is guided by an expert sustaining strict aseptic precaution and temperature requirement to 20-22 C. The addition of anticoagulant citrate dextrose solution formula A (ACD-A) is critical to prevent auto aggregation of platelet. The centrifugation leads to separation of blood components depending upon their specific gravity.

Difference between PRF AND PRP :⁵

PRF	PRP
Anticoagulant not required Held by membrane like assimilate which is released later	Anticoagulant required
Immediate centrifugation	Injectable
High concentration of growth factors	Not mandatory
Controlled release over 1 week	High platelet concentration High early release of growth factors
High FGF, VEGF, Angiopoietin, PDGF	High TGF beta 1, VEGF
High migration	

Mode of injection:

Various ways to yield PRP are:

Monotherapy: Topical application and injections

Combination therapy: Used with other treatment modality eg. Laser and microneedling.

PRP is used for stimulation of both superficial and deep dermis layers. For superficial stimulation, the injection must be done in the superficial dermis. The PRP must be injected into the deep dermis or subdermal tissues when using as filler. The superficial injection might be done just like mesotherapy technique in order to improve the skin texture, volume and hydration.⁶ PRP is a form of bio-stimulator that is safe and creates an immediate, long lasting volumetric effect with natural looking results. The various combination therapy including PRP with other treatment modality has also been studied, which shows better outcome than monotherapy.⁷

Side effects:

Till date no serious or permanent side effects have been reported. A burning sensation was noticed as a common finding in patients after the injection, which resolved without any treatment. It could be associated with adding calcium chloride to activate PRP. In addition, no study reported hyperpigmentation, serious infection or hematoma. Based on the results of these studies, PRP therapy is safe treatment method to improve the skin hydration, texture and remove the skin wrinkles.⁸

Restoration of the facial appearance using Botox and dermal fillers is considered safe and non-invasive. However,

novel concept of application of patient's own blood products such as PRP might be more desirable compared to Botox and dermal fillers. In addition, other skin characteristics such as periorbital darkness, skin texture and elasticity, acne scars, trans epidermal water loss (TEWL), and skin homogeneity were also assessed after PRP therapy in the selected studies. The early signs of ageing like dryness, pigmentary dyschromia and wrinkles shows remarkable benefit with this novel therapy. Various studies delineate a significant improvement in the skin texture and removal of the skin wrinkles.

Platelet concentrate evolution:

Platelet rich fibrin (PRF) which comprises of various growth factors and cytokines, which is held by membrane like structure which is released later. PRF is the next generation of PRP- it provides even longer lasting results as it releases growth factors over time. PRF is extremely versatile as it fills wrinkles, improves skin texture and hydration. In PRP, the end product is obtained in a liquid form whereas in PRF it is a platelet rich fibrin matrix. PRF has conveyed to be superior over traditionally prepared PRP.⁹ Its advantages include ease of preparation and lack of biochemical handling of blood, which makes this preparation strictly autologous. The various advantages of PRF over PRP are lack of biochemical handling of blood, no need of thrombin or anticoagulant, more cost effective, further simplified technique, better cell migration, proliferation, polymerization, role in haemostasis and copious on immune system. PRP in addition with amniotic or placental extracellular matrix (ECM) is also gaining attention with its diverse advantages. Multiple evidence support advocating use of leucocyte rich PRP help regulating immune function.¹⁰ Additionally bacteriostatic property of PRP has also gained popularity in respect to wound healing and infection.

Conclusion:

However, based upon best available literature at present, the potential benefit of PRP in the field of aesthetic medicine, has brought a major boom with its exciting possibilities. However, there is no sound comparison but different methods of assessment demonstrate remarkable sequel. Depending upon different studies conducted, it's a safe and effective modality for better skin reinvigoration. Therefore it's warranted to conduct multicentric large sample size studies along with long term follow up to bring optimum and general consensus.

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Medical Facials

Dr Sonali Langar, Dr Smita Nagpal

The concept of medical facials is new and is gradually becoming popular in cosmetology practice. It involves a blend of both medical and aesthetic procedures performed under supervision of a dermatologist using medical-grade products and equipment to attain a desirable result and giving added therapeutic benefit in the long run.

These are quick office procedures with minimal downtime and side effects and can achieve good patient satisfaction.

Indications of Medical facials

- Routine Skin care regimen
- They can be used in patients especially with sensitive skin or those in whom aggressive treatments are not possible.
- Before a special event like marriage or any other special occasion
- In patient in need of quick results

Various medical facials are listed below:

Carbon laser facial

This is a non-ablative laser treatment that uses the conductive qualities of carbon to quickly and painlessly exfoliate, cleanse, tighten pores, and even-out skin tone. The topical carbon suspension is applied which serves as an exogenous chromophore or photoenhancer to Q switch Nd:YAG laser 1064 nm light. Thus kinetic energy is generated which damages the stratum corneum, the pore walls with increased collagen formation in the reticular dermis.¹

Laser Toning

Laser toning involves use of low-fluence, 1064-nm wavelength of Q Switch Laser. The largest spot with ultrashort pulse duration, low-fluence, and multiple passes of QSLis used causing minimal damage to melanocytes as a whole but destroying the melanosomes and melanin granules within melanocytes and keratinocytes known as “subcellular selective photothermolysis,” thereby improving the skin tone of patient. Over enthusiastic treatment in skin of colour should be avoided by this procedure.²

Hydrafacial

This is a popular procedure using a combination of cleansing, exfoliation, extraction and hydration principles with an

added boost of antioxidants and chemical peeling. Exfoliation is done by a serum containing glycolic acid, lactic acid and algae extracts with the help of a patented tool called vortex. Vortex is glided over the skin with a serum composed of glycolic and salicylic acid to penetrate into the deeper layers. With the help of a extraction nozzle all the secretion from clogged pores are extracted, followed by infusion of anti-oxidant and collagen based serum on the skin.

Mesobotox

Mesobotox or microbotox involves multiple injections of small doses of botulinum toxin to tighten the skin and reduce the pore size. It acts by inducing atrophy of the sweat and sebaceous glands, and by weakening the superficial muscle fibers that insert into the skin. Botulinum toxin (100 units) is mixed with physiological saline (usually in double dilution than what is used in routine practice) which are injected at 0.8 to 1.0 cm intervals into the dermis or the interface between the dermis and the superficial surface of the facial muscles. The effects of treatment typically last for 3 to 4 months but may last for up to 6 months.

Photofacial

Photofacials are treatments that use different types of light emitting devices to improve the blood circulation and collagen induction in skin. Commonly two types of photofacial — intense pulsed light (IPL) photofacials and light emitting diode (LED) photofacials are popular. IPL photofacial, involve use of handheld device that emits pulses of broad spectrum light through direct contact with the skin. LED photofacial involve handheld devices or lamps that emit various colours of LED light. The effects of this procedure depends on the color of the light. For example, blue light is anti-inflammatory and treats acne by killing acne-causing bacteria, while red light stimulates collagen production and skin rejuvenation therapy improving ageing skin condition.³

Oxyfacial

The facial involves the delivery of moisturizers, vitamins and minerals into the skin using a stream of pressurized oxygen. This is thought to improve visible signs of aging linked to poor conveyance of oxygen from subcutaneous capillaries to the surface of the skin. Effects of oxygen facials are said to last about 3-5 days and for best results, many will recommend a series of six treatments along a six-week timeframe, followed by monthly touch-up visits.

Silk Peel facial

SilkPeel is not a peel, but a dermal infusion facial treatment that involves non-invasive microdermabrasion and dermalinfusion enabling simultaneous exfoliation and application of while applying customized serums to treat specific skin conditions. The available serums include hyaluronic acid, Vit C, salicylic acid and cocktail of brightening serums. Silkpeel does not use chemicals to achieve the peel exfoliation rather diamond-tipped microdermabrader , with a pneumatic vacuum achieves it. This facial stimulates collagen and elastin production, which has the effect of reducing the appearance of fine lines and wrinkles.

With the influx of so many treatment options available, it can be a daunting task to decide by the patient to enrol in which procedure. The choice of treatment would largely depends on the age, condition of the skin, as well as the specific skin concerns being highlighted by the patient. Medical facials can especially be used as maintenance procedures to give patients sustained benefits. Thus medical facials are very good add on procedures to be an important part of the armamentarium for skin rejuvenation .

Side effects of medical facials

- Mild erythema and Irritation of skin are the most common. It's usually temporary and lasts only for a few hours.
- Dryness of skin
- Post procedure aggravation of acne, can be due to the products used.
- Scarring can very rarely happen if not performed properly

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Diet and glow

Dr. Rakhee Nair, Dr. Vinma Shetty

Introduction

Glowing skin is a dream of each and every individual. There is no one stop solution to this and one needs to ardently pursue with efforts towards achieving this. The key to this is a multifactorial approach, like daily skin care routine, photoprotection, regular exercise regime and a balanced diet. Modern nutritional science is developing new insights into the relation between food intake and health, and effects of food ingredients may prove to be biologically relevant for optimal skin condition. Hence a well-balanced diet plays a pivotal role in contributing to the glow factor and general wellbeing. Just as the saying goes that a healthy body harbours a healthy mind, so does it have an effect on glowing and fresh skin.¹

Role of external and internal factors on skin

Appearance of the skin is primarily determined by its surface texture, color, and physiologic properties such as elasticity, sweat, scent, and sebum production. Skin condition and functioning are affected by environmental factors, such as ultraviolet (UV) irradiation, free radicals, toxic and allergic compounds, and mechanical damage, and by endogenous factors, such as genetic predisposition, immune and hormone status, and stress. Consequently, the skin undergoes alterations resulting in photoaging, inflammation, reduced immune function, imbalanced epidermal homeostasis, and other skin disorders. Skin functioning and skin attractiveness are dependent on nutrition. This is evidenced by the development of skin lesions in response to nutritional deficiencies. Dietary supplementation with the deficient vitamins, minerals, or essential fatty acids improves skin conditions in these situations.¹

Hydration and glow factor

The main components in diet which helps to achieve the goal of a beautiful glowing skin are hydration via water intake and the diets rich in antioxidants, minerals, essential fatty acids; all in the adequate proportion. Skin hydration has been related to skin mechanics to justify preservation of a younger, healthier looking skin. Studies suggest that increasing the dietary water intake would affect the skin the same way as a topical moisturizer. Dermal water was reported to decrease the friction between fibres, acting as a "lubricant", including in the upper

layers, thus facilitating the dynamics of the overall structure. International journal of cosmetic science has reported that drinking 2.25 litres (9.5 cups) of water every day for four weeks altered skin density and thickness.²

Diet and skin whitening

There are multiple food items which are said to have skin whitening properties like carrot, papaya, cucumber, avocado, red grapejuice (redwine), etc. However scientific literature to prove the same are unavailable.

Diet and photoaging

Photoaging caused by the exposure to sun is a major factor contributing to dryness and wrinkling of skin. The ultimate aim of efforts to protect the skin against sunlight is prevention of photoaging, photo immunosuppression, and photo carcinogenesis. Nature anticipates these conditions by increasing epidermal thickness, stimulating melanogenesis, and providing natural antioxidants in the superficial skin layers. Nutritional supplements support these processes and thereby serve as an additional protective measure against the harmful effects of UV light.¹

Antioxidants in diet

Skin is endowed with natural antioxidants as it is exposed to numerous environmental insults. Vitamin E, catalase, superoxide dismutase, glutathione peroxidases are abundantly present in the viable layer of the epidermis. The extracellular space of skin epidermis and dermis, contains large amounts of antioxidants such as ascorbic acid, uric acid, and glutathione. The outermost layer, the cornified envelope of human skin contains antioxidants like, glutathione, vitamin c, uric acid, alpha-tocopherol, squalene, and coenzyme q10, distributed in a gradient with the highest concentration on the deepest cornified envelope layer. External source of antioxidants are abundantly available in food items that can be consumed on a regular basis.

Vitamin C is a cofactor for critical enzymes in collagen synthesis and for recycling photooxidized α -tocopherol, thereby regenerating vitamin E. Its main functions are that increases collagen synthesis, reduces MMP (collagenase) expression, inhibits activation of the transcription factor $\text{Nf}\kappa\beta$, inhibits tyrosinase and decreases sunburn cells by 40% to 60%. It is abundantly found in citrus fruits, black currants, leafy green vegetables, and red pepper.³

Vitamin E protects the cell membranes from oxidative stress, hence has excellent antiaging effect. It is obtained from vegetable oil, seeds, nuts, and meat.^{3,4}

Vitamin A is available in two forms as retinoids and carotenoids (β carotene and lycopene). Retinoids bind to the nuclear receptors, retinoic acid receptors, thereby inhibiting ap-1 and MMP-1 expression. Carotenoids scavenge O_2 and quench lipid peroxidation. They are found in red fruits and vegetables like carrot, sweet potatoes, pink grape fruit, tomatoes.³

Coenzyme q10 a fat soluble compound in all cells as a part of energy transfer chain, scavenges ROS. It is present in fish, especially shellfish.

Green tea extracts with high levels of polyphenols like gallocathechin- gallate, epicatechin-3-gallate, epigallocatechin, and epigallocatechin-3-gallate, scavenges Ros, stabilises glutathione peroxidase, glutathione, catalase and inhibits ap-1 and MAPk expression.

Apart from these some of the other food items and the extracts which have considerable antioxidant properties are enlisted below.

Coffee beans (coffee arabica), milk thistle (silymarin), skin and seeds of grape, red wine, berries (resveratrol), grape seed extract, pomegranate, red meat and brewer's yeast (alpha lipoic acid), turmeric (curcumin), grape seed , cranberry, black currant (pycnogenol), L carnosine (fish and meat), soy isoflavones (soya beans, ginkgo biloba).

A study on the efficacy of juices in improving the glow of skin has shown that pomegranate juice was the best amongst those studied.³

VITAMIN	FOOD SOURCES	CLINICAL BENEFITS
VITAMIN C	Citrus fruits, black currant, green leafy vegetables, and red pepper	Antiinflammatory Photoprotective
VITAMIN E	Vegetable oils, seeds, nuts, meat	Photoprotective, Antiinflammatory, Anticarcinogenic
VITAMIN A	Red fruits, carrots, sweet potatoes, tomatoes	Antiageing, Anticarcinogenic
COENZYME Q 10	Fish, shell fish	Antiageing, Anticarcinogenic
GREEN TEA	From Camella sinensis (tea) plant	Antiinflammatory, Anticarcinogenic, Photoprotective

Role of carbohydrates and fats

Milk consumption and hyperglycaemic diets can induce insulin and IGF-1-mediated pi3k / AKT-activation inducing sebaceous lipogenesis, sebocyte, and keratinocyte proliferation, which can aggravate acne. Hence it is ideal to avoid such diet in patients having acne prone skin.⁵

Studies have also been conducted to know the effect of fats and carbohydrates on skin.

Linoleic acid is associated with a lower prevalence of a wrinkled appearance, senile dryness, and skin atrophy, but higher intakes of fats and carbohydrates are associated with a higher likelihood of features of skin aging.⁶

A high intake of carbohydrates especially sugars, was previously reported to affect skin aging through the glycation of skin proteins, which decreases skin cell viability, induces inflammation and deteriorates skin hydration.⁶

Conclusion nutrition has historically been one of the earliest and most important factors associated with skin health. However the degree of its impact on skin anatomy and physiology and mechanisms involved in various nutrition dependent alterations remains to be highly controversial. Practical hardships in finding association amidst the reasonable and positive correlation between skin health and nutrition should be overcome. More studies should be undertaken to establish the positive effect of diet on skin glow.

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