

Facial Serum: Its Formulation, Usage, Special Ingredients, Various Types and Benefits

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ABSTRACT: These days, the demand for skin care products and treatments has increased to a larger extent. Having a proper appearance and a beauty standard has gotten a lot of importance. As a result people and just companies in general are leaning more and more towards taking care of their skin. A typical skin care routine consists of a cleanser, a serum, a moisturizer and a sunscreen. Among these, it has been seen that the serums are the new go to when it comes to building an excellent skin routine. Serums come in various types of formulation be it for oily, dry or anything in between type of skin. The goal of this literature review is to highlight various benefits of using the correct serum formulation for numerous skin and what results majority of the people can expect. It also contains information regarding very many skin healing and brightening ingredients that are being used in the serums these days and how these ingredients work on the skin giving it a specific glow which otherwise might not be possible. Although currently no effective processes are available for slowing down the skin aging conditions, serums may up of various concentrated vitamins and acids have shown miraculous effects.

KEYWORDS: History of facial serums, formulation, types, selection, application, marketed products.

I. INTRODUCTION:

Study of human skin represents an important area of research and development in dermatology, toxicology, pharmacology, and cosmetology, in order to assess the effects of exogenous agents, their interaction, their absorption mechanism, and/or their toxicity towards the different cutaneous structures.^[1] The importance of beautification to the mankind has been known since the prehistoric time and the desire to look beautiful

and healthy has been developing in the society. Cosmetic is a Greek word which means to 'adorn' (addition of something decorative to a person or a thing). Cosmetology is the study and application of beauty treatment. It's an art or science of beautifying and improving the skin, nails and hair and the study of cosmetics and their application. A skin care formulation must be able to deliver the powerful agent into the skin to fulfil the intended objective. Face serum is the answer to deliver the precious active ingredient into the skin thus eliminating the use of hazardous chemicals in giving instant results.^[2]

Serum is a concentrated product which is widely used in Cosmetology. The name comes from itself in professional cosmetology. The cosmetic serum is as concentrated in water or oil as any other cream. Serums are defined as concentrated product that contains ten times more organic matter than cream. Therefore, deals with the cosmetic problem quickly and effectively.^[3] Face serum is a highly concentrated emulsion which is available in water based and oil based. Serums or defined a concentrate, contain approximately ten times more of biologically active substances than creams, therefore allows better skin problems treatment.^[5] Incorporating a few drops of face serum with daily skin care routine will deliver noticeable results within a month or less. This is because face serums are made of very small molecules that help it to penetrate deep into the skin quickly. Serum is packed with a bunch of beneficiary active components and nutrients such as antioxidants, ceramides, amino acids and others. This explains why face serum always being the costliest item in a skin care set.^[2]

Whether it is moisturizer, anti-wrinkle or anti-aging product or skin serum, all these products should contain antioxidants, cell-communicating ingredients and skin-identical ingredients. All skin

type needs these ingredients to be as healthy as possible. Gel and liquids preparations are best for oily and combination skin, serums and light lotions are best for normal to dry skin, more emollient lotions and moisturizing creams are best for dry to very dry skin.^[4] Texture is all about skin type- but the brilliant ingredients for healthy skin the same for everyone, regardless of product, texture, or personal preference. Skin is a protective and largest organ of body which is struggles to heal and repair itself 24 hours, but sometimes skin can develop dry patches for many reasons like UV rays, pollutants, makeup left on overnight can cause irritation or allergic reactions.^[2] The facial serum includes several ingredients associated with improvement in the appearance of fine lines and wrinkles and increased barrier function including a neuropeptide. The facial serum also contains AP-8, a neuropeptide associated with muscle contraction, beta-glucan, a cell turnover and regenerative extract that is believed to support healthy immunosurveillance; sodium hyaluronate, a humectant and nascent to extracellular matrix and vitamin C&E formulations and green tea, both of which are antioxidants including polyphenols.^[4] The biggest difference between a serum and a cream or lotion is what the formulation doesn't include. They also contain fewer lubricating and thickening agents, like nut or seed oils. Most serums are water-based, eliminating oils altogether.^[19]

II. HISTORY OF FACIAL SERUMS

As defined in the dictionary – a serum is the clear, yellowish fluid obtained upon separating whole blood into its solid and liquid components after it has been allowed to clot, so it is not surprising that the precursors of modern-day serums were based on horse blood, egg albumin, and bovine placenta. Packaging these products in sterile ampoules preserved with oxyquinoline (and later, the invention of parabens) made them available commercially. This is a practice that stayed with us since the early days of short product shelf life, which meant small batches had to be made and used up quickly before the product spoiled.^[31]

Exercise, cleanliness, and skincare were all held in high regard during the 1800s. Zinc oxide was used to lighten skin, but often caused allergic reactions. Hygiene products became less expensive and more accessible. Harsh cleansers were often used as were egg yolks, honey and oatmeal to often the skin and help diminish blemishes. Lemon juice

was also used to naturally bleach the skin a few shades lighter. During this time, too, Chapstick, Vaseline, and baby powder were invented, all of which were used in skincare regimes. The 1900s was an explosion in terms of accessible skincare for women. Carmex was invented in 1937, and sunscreen in 1944. In 1946, Estee Lauder launched their cosmetics line in NYC, and then in the 1950s Clearasil, Ponds, Oil of Olay, and Clinique were all launched, too. The 1980s saw a rise in all natural skincare products. Dr. Howard

Murad's line was launched in 1989, and Burt's Bees in the 1980s, too. In 2002, the FDA approved Botox for frown lines on the face. In 2007, The Zeno, a hand-held, battery-operated device, transfers heat onto a blemish, killing the bacteria and making them disappear after only a few treatments.^[32]

Serums have come quite a long way and have evolved greatly since their debut in the 1930s That is when the first facial serums began being produced commercially. Of course, the shelf life was very short since they tended to be very susceptible to bacterial and fungal infections, but the principle behind these products was created. The first serums were formulated to reduce wrinkles and tighten the appearance of the face.

These serums were generally based on albumin – the tightening ingredient in egg whites, which have been used by women all over the world for ages as a facial mask.^[32]

Egg whites were separated from the yolks, whisked up, and applied to the face and neck for 15 to 20 minutes, then washed off with cold water. This produced a lifted and tightened result similar to that of a serum. A serum's molecule is usually very small and delivers the ingredients to all skin layers without clogging the pores with any oil, glycerin, or other comedogenic fillers.^[31]

III. FORMULATION OF FACIAL SERUMS

In formulating a face serum, the physical properties and stability are the main characteristics in determining its quality. A face serum formulation is basically an emulsion consists of two immiscible liquids. In order to prevent emulsion instabilities, thickener and emulsifier are introduced to the system. Emulsifier will balance the system by minimizing the interfacial tension between the two immiscible liquids and at the same time stabilizes the dispersion phase from coalescence. Contributing to the system, thickener also plays an important role as rheology modifier

and provides flexibility to the flow characteristic of the emulsion. [2]

A chemical property which is considered important in formulating is pH value. If the pH value of the skin is changed, the skin's natural microbiology and function will be interrupted. This in turn causes numerous skin problems including acne, skin flakiness, excessive sebum secretion and other serious conditions. The natural skin microflora is intact on the skin with pH value ranging from 4 to 4.5, while pH value ranging from 8 to 9 eliminates the skin natural microflora. Formulating a face serum with suitable pH range can help in improving the skin barrier function. [2] Formulating a face serum or any other formulation can be challenging. This is because the traditional 'One Factor at a Time' (OFAT) method was highly time consuming and may result in unnecessary experiment that consume costs. OFAT was done by changing one factor at a time while keeping the other factor as constant. It requires large number of tests. [7] On the contrary, optimization using Design Expert software could save time, costs and labor. D-optimal design is suitable to be used in formulating cosmetic formulations thus it is applied in the formulation studies widely. [2]

In formulating a face serum, the mixing of water phase and oil phase is crucial in order to create a stable system over an extended period or longer product shelf life. Naturally, the oil and water systems are thermodynamically unstable. Incorporation of emulsifiers into the system can minimize the interfacial difference between the water and oil phases thus mix the system. [2]

3.1 Five types of organic facial serum formulations:

3.1.1 The oil serum:



Figure No. 1

Of all the facial serums, the oil serum is the easiest to formulate. It generally contains a foundation of exclusively high-end specialised carrier oils that are fast-absorbing (otherwise known as 'dry' oils). The high-end oils contained with the serum not only offer moisturizing and barrier repair properties, but also contain polyphenols, essential fatty acids and other compounds that can be metabolized by the skin.

3.1.2 The gel serum:



Figure No. 2

Gel serums impart that 'tightening' feeling on the skin and allow your customer to feel that their skin is being temporarily lifted or tightened in certain areas of the face. Because this formulation is water-based, the gel serum gives you the opportunity to incorporate some wonderful waterbased (hydrophilic) botanical extracts. Gels are often thought of as transparent, but you can impart color to gels by infusing glycerides, including colourful extracts and adding colourful botanical

3.1.3 The water-based serum:



Figure No. 3

Water-based serums are similar to gel serums, although will contain fewer gums and thickeners. You would use a water-based facial serum to deliver high performance hydrophilic botanical extracts which are then trapped against the skin underneath a cream or lotion.

The perfect way to encourage greater penetration of water-based ingredients into the skin, thereby delivering their high-performance ingredients slightly deeper into the layers of the skin, is by layering an anti-ageing facial mist underneath an emulsion and then underneath an oil.

The oils will create an occlusive barrier which will encourage greater penetration of ingredients. A facial serum will contain a foundation that consists of water-based ingredients such as hydrosols which can have soothing, skin toning and balancing properties. You would then include skin-feel ingredients such as humectants, which help the serum cling to the skin.

3.1.4 The emulsion serum:



Figure No. 4

A facial serum that consists of an emulsion is a moisturizer which delivers high performance ingredients into the skin, as well as acting to strengthen the skin's barrier function. An emulsion brings together two 'immiscible' phases – phases that don't want to mix with each other, such as oil and water. We use an emulsifier to create a bond between the oil and water and hold them in a stable form. An emulsion has the greatest potential for delivering high performance actives deep down into the skin's tissues.

3.1.5 The pressed balm serum:



Figure No. 5

The biggest difference between the balm serum and all of the others is that this serum takes on a solid form, whilst all of the others are liquid. A balm serum has a typical balm foundation, consisting of butters, waxes and oils, but then contains oil-soluble (lipophilic) active ingredients that can offer benefits to the skin. There are dozens of interesting exotic butters and waxes that can be used in a balm serum, paired with hundreds of wonderful botanical oils.^[34]

IV. SELECTION OF A FACIAL SERUM

Now, this can be a problem because there are numerous options available in the market, and all of them promise beautiful and healthy skin. These are the factors taken into consideration before selecting a Facial serum:

Either you want to get rid of fine lines or dark patches around mouth or reduce the random

dark spot on your face or any other Facial blemishes, one should always know what they are exactly looking for.

Consider your skin type. If you have acne-prone and oily skin, pick a face serum that has salicylic acid and retinol. For dry skins, try something with Vitamin C and hyaluronic acid. And if you have sensitive skin, try a serum that has natural ingredients as natural ingredients always show the best result.^[17]

The ingredients are what sets face serums apart from the rest of the cosmetic competition. The best part about face serum is that it strips away all the additives, fillers and fluff that we don't need. What we are left with is the most essential, skin nourishing elements for a flawless face. It's like buying the freshest, most organic food, straight from the source, without being heavily processed or riddled with artificial ingredients and preservatives. Face serums contain only what we need most and that is why it's a total powerhouse in one's beauty routine.^[17]

Serums contain a wide variety of ingredients, from common to exotic, depending on your goals. Here are few common ingredients to watch out for:

4.1. Vitamin C

Vitamin C is a water-soluble vitamin, antioxidant, and essential co-factor for collagen biosynthesis, carnitine and catecholamine metabolism, and dietary iron absorption.^[8] It's a common and natural anti-ageing ingredient. If you are in your late 30s or 40s and have dry and patchy skin, look for a serum that contains vitamin C in it. This vitamin works hard to repair, protect, and revitalize your overall complexion and fights the signs of aging. Two especially powerful forms of vitamin C used in face serums are L-Ascorbic Acid (water-soluble vitamin) and C Ester (fat-soluble vitamin).^[26]

2. Hyaluronic Acids

This ingredient is another best one to treat dehydrated and patchy skin. It traps in the skin's natural moisture and water levels, and make sure that it does not lose any of its natural moisture. This ingredient makes your skin look naturally healthy and glowing. Hyaluronic Acid specializes in replenishing moisture to dry, parched skin. Hyaluronic acid (HA) acts as a biologic humectant, thus retaining water in the skin, making HA useful as a topical moisturizing ingredient.^[9] Hyaluronic

Acid is super effective because it can absorb up to 1,000x its own weight in water. Since it is so absorbent, it's able to draw in water and lock in vital moisture by rehydrating the skin, it smoothens and plumps the surface, while dramatically reducing fine lines and wrinkles.[26]

4.3. Antioxidants

Antioxidants are very essential to protect the skin from stress and environmental pollution. These also help in reducing pigmentation, fine lines and wrinkles. The administration of antioxidants in smaller doses, but in combination, has been asserting as the safest alternative for its use. [10]

4.4. Anti-inflammatory

If you are team sensitive skin, use a serum with anti-inflammatory properties. This will prevent redness, breakouts, dryness, and inflammation. Plant oils have been utilized for a variety of purposes throughout history as anti-inflammatory agents^[11]

4.5. Retinol

Retinol is one of the most clinically proven anti-aging ingredients available today. It stimulates the production of collagen, which leads to firmer, plumper skin. Retinol is also able to tighten pores and reduce hyperpigmentation by evening out skin tone. This vitamin leaves you with a fresh, vibrant glow and visibly softer skin.^[26]

4.6. Alpha Hydroxyl Acids (AHAs)

AHAs are natural acids that are derived from fruits like lemons, grapefruits, and oranges. These acids are chemical exfoliators that keep your complexion clear and vibrant by removing the buildup of dead and damaged skin cells. They also keep your pores from getting clogged and help prevent acne breakouts. By exfoliating the skin, they clear dead skin and debris to make your facial products work better and absorb more efficiently. AHAs have been used as superficial peeling agents as well as to ameliorate the appearance of keratoses and acne in dermatology. [12]

4.7. Vitamin E

This vitamin is another potent antioxidant that works well in conjunction with vitamin C. This essential nutrient minimizes free radicals and reverses the signs of aging. It also moisturizes the skin, leaving you with a soft, luscious complexion. Vitamin E works to brighten and even skin tone

and texture. Vitamin E is an important fat-soluble antioxidant and has been in use for more than 50 years in dermatology. [13]

4.8. DMAE (Dimethylaminoethanol)

DMAE is often referred to as a “facelift in a bottle.” This nutritional substance has been clinically shown to lift, firm, and tighten the skin. It works wonders for anti-aging and helps reverse drooping and sagging that naturally comes with time. The benefits of DMAE in dermatology include a potential anti-inflammatory effect and a documented increase in skin firmness with possible improvement in underlying facial muscle tone. [14]

4.9. Glycerin

Glycerin helps the skin attract and retain moisture, keeping it supple and noticeably soft. All of these qualities give the skin a youthful appearance and minimize signs of aging. Glycerin functions as a denaturant, fragrance ingredient, hair conditioning agent, humectant, oral care agent, oral health-care drug, skin protectant, skin conditioning agent—humectant, and viscosity-decreasing agent. [15]

4.10. Green Tea

Green Tea is often touted for its health benefits within the body, but it greatly supports the outside, as well. This super antioxidant has strong anti-inflammatory effects that promote skin health. Green Tea protects against the damage of free radicals that is due to poor diet, pollution, UV rays, and smoking. It also helps reduce the appearance of wrinkles and fine lines. Green Tea rejuvenates the skin, evens out complexion, and lessens dark spots and hyperpigmentation. This antioxidant encourages the exfoliation of dead skin cells, which improves the overall radiance of skin. Some studies indicated that green tea has an antiproliferative activity. [16]

4.11. Stem Cells

The work of stem cells is rather remarkable. Stem cells are able to repair every type of cell in the body. They stimulate cellular renewal, proper cellular function, and increase the overall production of collagen. Stem cells completely rejuvenate and protect the skin. These cells are usually derived from plants such as lilac, grape seed, edelweiss, and swiss apple. However, sheep placenta extract is also another beneficial form used in face serums. [17]

4.12. Growth Factors

Growth factors are another interesting and highly sought-after inclusion in face serum. They aid in the division of healthy cells, growth of new skin cells, and production of collagen and elastin. This greatly helps the appearance and texture of skin. Complexion is visibly evened out, enhanced, and healthy. Growth factors can be synthetically made or derived from plant, animal, or human sources. A plant-based Kinetin, secretions from a particular snail (*CryptomphalusAspersa*), and colostrum from a mother cow.^[26]

4.13. Resveratrol

Resveratrol is a particularly potent antioxidant that is found in the skin of grapes. This natural compound protects the skin and neutralizes damage from free radicals. Free radicals affect the production of elastin and collagen, two key players in the health and vitality of skin. Resveratrol acts as a strong skin revitalizer and helps restore a youthful contour.^[18]

4.14. Methylsulfonylmethane (MSM)

This ingredient is quite a mouthful, so the abbreviation MSM is often used. MSM is a sulphur compound that's present in our bodies and in some plants. It's been referred to as "nature's beauty mineral" because it promotes the production of keratin and collagen. MSM enhances cellular respiration, which allows cells to utilize oxygen

and function properly. It also brightens complexion, treats acne and breakouts, and enhances the absorption of nutrients into the skin.^[26]

4.15. Botanical Extracts and Oils

As we mentioned earlier, there's literally an endless amount of beneficial ingredients that can be used in face serums. This makes it nearly impossible to fully cover all of the different combinations. However, botanical extracts and oils (while there are countless forms of them) are definitely heavy hitters in the make up of face serums. So, it's necessary that we put some of the most prominent types in this ultimate ingredient guide.

Botanical oils and extracts naturally contain some of the most nourishing and regenerative properties that we could give our precious skin. They are packed with amino acids, antioxidants, fatty acids, phytonutrients, and essential vitamins.

This concludes, face serums are chock full of the highest quality and most potent ingredients. Each ingredient works overtime to offer not just one but many beauty benefits. When you have a combination of these ingredients, your skin is perfectly set up to be as nourished and radiant as possible. Face serums are simply the best supplements you can give your skin.^[26]

Sr. No	Oil or Extract Name	Biological Source	Uses
1.	Rosehip Seed Oil	Rosa canina rose bush	Exfoliates the skin
2.	Jojoba Oil	A shrub named S. Chinensis	Treating skin conditions like acne, eczema, and psoriasis
3.	Avocado Oil	Avocado fruit	Calms itchy skin
4.	Geranium Oil	Leaves of Pelargonium graveolens	Reducing the appearance of wrinkles
5.	Evening Primrose Oil	Evening Primrose seeds	Improves hydration and elasticity
6.	Liquorice Extract	Glycyrrhiza Glabra plant	Brightens and soothes itchy and irritated skin
7.	Lavender Oil	Flowers of lavandula angustifolia	Evens skin tone
8.	Rosemary Extract	Leaves and twigs of Rosemary plant	Reduces swelling

V. APPLICATION OF A FACIAL SERUM

Face serum is a lightweight water-based skincare essential that targets different skin concerns. There are various kinds of serums that are made with breakthrough or game-changing ingredients like niacinamide, hyaluronic acid, vitamin C, AHAs and BHAs. If you truly want to reap the benefits of a face serum, you must know how to choose one that matches your skin type and skin concern.

With such a plethora of serums available on the market, and with so many options to pick from and each claiming that they solve a skincare concern, which serum do we pick? How many do we really need in our routine? When and how should we use them? When should I apply a serum? Is it when the skin is damp? If so, why?

It is best to cleanse face and gently pat semi dry. While the skin is damp, it is best to then apply serums which generally contain a higher concentration of actives. This is when the skin is more permeable, and penetration is improved. Once the serum has been applied with upward sweeping motions to the face, from the décolletage and neck and has fully absorbed, eye cream, moisturizer, and sunscreen can be applied.

Unlike other skincare products like thick face creams and moisturizers that you massage into your skin in an upward direction, serums are meant to be applied to your face in small tapping motions with your fingertips or your palms. Do not rub your skin excessively, let the serum absorb into your skin on its own.^[25]

Here are a few steps for how to apply a serum, in an effective way:

5.1.1 Start with a clean face:



Figure No. 6

It's important to cleanse and exfoliate your skin before applying a serum. This will help to remove excess sebum, grime or toxins that could prevent the serum from being absorbed.

5.1.2 Apply a pea-sized amount:



Figure No. 7

Less is More. Take a few drops of it on your palm or directly use a dropper and gently massage it on your skin.

5.1.3 Use gentle circular motions:



Figure No. 8

When applying the best natural face serum, use gentle circular motions. This will help the ingredients to be absorbed more evenly into the skin. Along with that you can also use the tap method.

5.1.4 Avoid the eye area:

Be sure to avoid the area around your eyes, as this is sensitive and prone to irritation. Once you've applied the serum, give it a few minutes to absorb before applying moisturizer or makeup.

5.1.5 Allow time for absorption:

Once you have applied the face serum, allow it to absorb into the skin for at least 5 minutes before applying moisturizer or makeup.

5.1.6 Store in a cool, dark place:

Light and heat can break down face serum and reduce its efficacy. Store it in a cool and dark place such as a cabinet or drawer.

5.1.7 Use within six months of opening:

Face serum is most effective when used within six months of opening. After this time, the ingredients will degrade and lose their potency.

5.1.8 Replace every 3-4 months:

Like other skincare products, face serums have a shelf life and will eventually expire. So, to get the most out of your product, you should replace it every 3-4 months. [27]

Well-formulated face serums absorb incredibly fast and fully disappear into your face and neck. If your serum is leaving you with a sticky or oily residue, it's most likely not doing its job effectively. Serums contain powerful ingredients that can have an impact on the metabolism of cells. Face serums can turn out to be way too active for younger skin. The ideal age to start using face serums would be late 20s and early 30s. This is the age at which the first signs of aging appear. You can continue using face serums till the age of 50+. [27]

VI. VARIOUS TYPES OF FACIAL SERUMS

Serum is one of the most important steps in a skincare routine. If we were to use an analogy it would be the boiling pot; it's the actual activity, what you're cooking. Then think of the saucepan lid as your moisturizer, it helps the activity happen at its fastest, it's optimum. Sealing the heat into the pan acting as a protective layer. There are very few cure-all serums out there, and depending on the ingredients they feature, a serum will generally be an antioxidant, hydrating, anti-aging, brightening, or exfoliating serum. Each type caters to specific skincare needs and varies in when and how to use them. [27]

6.1 Anti-oxidant Serums

These serums protect your skin from free radicals (UV rays, pollution, etc.), which can accelerate the skin's aging process. Many antioxidants also provide other benefits like increasing collagen production or soothing irritations. For this reason, they are often the most popular serums as they're considered to target many skin concerns. Adding serums with high antioxidant quantity will help strengthen the skin. Antioxidants to look out for include Vitamin C, E and Resveratrol. Best in the mornings to protect your skin throughout the day. However, they can also be used at night.

6.2 Hydrating Serums

These are often packed full of humectants such as Hyaluronic Acid. They are formulated to draw and help retain moisture on your skin to keep

it soft and supple. Use once a month for best results.

Could be used in the mornings as well as at night.

6.3 Brightening Serums

These are formulated to improve skin tone and clarity by preventing discoloration and dullness.

Most brightening serums actually don't brighten your skin by getting rid of discoloration, but by preventing it from forming in the first place. A lot of factors can trigger pigmentation to form and these brightening ingredients help stop the process so these dark spots never appear.

6.4 Anti-ageing Serums

After the age of 25, our collagen production starts going downhill, so it's important to start using anti-aging serum in your early 20's. While peptides are gentle and can be found in a variety of serums, the anti-aging gold standard is tretinoin, the most potent (and irritating) form of vitamin

A. Retinol and retinyl palmitate are gentler forms. In the evening, unless your serum doesn't contain any vitamin A derivatives, then you can use during the day too. [25]

6.5 Serums for Hyperpigmentation

Uneven pigmentation can be attributed to various factors such as the natural skin coloring, genetics, too much sun exposure, stressed skin or changing environment conditions. Some common areas pigmentation can occur are under your eyes, around the mouth or sometimes even on the cheeks. Here's where niacinamide and vitamin C serum benefits play a vital role. Niacinamide is a super versatile ingredient that suits all skin types and targets concerns like pigmentation. The great thing about niacinamide is that it's also very beginner friendly. So, if you are just starting to curate your skincare stash, give this a try.

6.6 Serums that reduce acne and fade acne scarring

One of the most common issues that prevail across all skin types is acne scarring. Acne scarring is also referred to as dark spots that are left behind in the same spot where you had that pesky breakout. In some cases, especially people with brown skin, acne scars take a while to fade.

Although, they do go away with time and the right serum. Choose a niacinamide serum. If you're looking for a more targeted care, you can

even use your niacinamide serum as a spot treatment. A few things to keep in mind:

6.6.1 Using niacinamide for a minimum of 3 weeks and a maximum of 3 months is when you see true results. So, be patient.

6.6.2 If you want to expedite the fading process, sunscreen is the perfect answer. Brown skin, when exposed to sun, generate more melanin in order to give skin more protection. This process can increase the longevity of acne scars.

However, using sunscreen acts a protective screen that increases the healing speed of acne scars. When you use ingredients like Vitamin C, it makes your skin even more vulnerable to sun damage.

So, don't skip on SPF.

6.7 Serums for oily skin

Let us target the root cause of acne scarring which is acne itself. If you have oily skin, then you're no stranger to this unwanted appearance on your face. A great serum to incorporate to your skincare routine if you're tackling pimples is one that calms skin, reduces irritation and inflammation. So, go for a gentle serum. Also, using a niacinamide-based serum as a moisturizer during the day is a great alternative to cream-based moisturizers during hotter months as it keeps the skin nourished without the heavy greasy feel.

6.8 Serums for sensitive skin

When you're dealing with sensitive skin, opt for ingredients that won't further irritate or dry out your epidermis. Vitamin C is a great option, but seek out Sodium Ascorbyl Phosphate, a more stable and gentle form of vitamin C than L-Ascorbic Acid, which is frequently found in skin care products. And because they're naturally produced by the body, serums with hyaluronic acid and peptides are also good choices for sensitive skin.

6.9 Serums for combination skin

If your skin tends towards both dry and oily, it's best to opt for a serum that's designed to handle both. The best face serum options for combination skin are vitamin C, hyaluronic acid and peptides, which will help keep your skin balanced.^[24]

If you're looking for a serum to help improve your complexion, here are a few factors you might want to keep in mind:

- a) **Do a patch test before using it:** As with any new skincare product, it is always better to conduct a patch test before using face serum all over your face. You should apply a small amount of the serum or a face glow serum for oily skin to your inner elbow and then wait 24 hours to check for any irritation or allergic reaction. If everything looks good, proceed with using the product as directed. This is especially important for people with sensitive skin (and thus for people looking for a face glow serum for oily skin).
- b) **Should be budget-friendly:** Many high-quality serums are available on the market, so you don't need to spend a lot of money to get a good one. However, please don't choose the cheapest option, as it may be ineffective or harmful to your skin.
- c) **Read reviews before buying:** It helps to see what other people think of the skincare product you are buying. Look for both positive and negative reviews to get an unbiased opinion.
- d) **Check the expiration date:** Don't use any skin care product that is past its expiration date, as it may be ineffective and can even cause irritation or skin damage.
- e) **Read the instructions on the label carefully:** Most serums should be used twice daily, in the morning and evening. Make sure to choose the best face serum for all skin types that can cleanse and tone your skin. Also, follow the directions on how you should it.^[24]

VII. BENEFITS OF USING A FACE SERUM

From hydrating the skin in order to reduce the appearance of fine lines and wrinkles, to minimizing the appearance of dark spots and refining skin's texture, serum truly does it all. A good serum that contains antioxidants will protect the skin from environmental stressors and is worth the cost and effort alone. Serum can smooth the skin, firm the skin, and even exfoliate. It really just depends on what you're looking for your serum to accomplish.^[19] Religious usage of serum boosts collagen production and assists in improving the texture drastically and makes the skin firm, smooth and fresh. Especially vitamin C content plays a vital role in the rejuvenation of the skin. Dark spots, scars, and pimple marks can be easily lightened with serums that have high plant-based concentrates. Also, it can prevent you from harmful inorganic treatments like chemical peels, which in turn makes your skin susceptible to sun damage.

Blackheads and whiteheads can be a nightmare for some people, which are generally the result of enlarged pores and pollution.^[33]

Regular use of coffee-based face serum with vitamin C can reduce the size of open pores, which in turn treats and prevents blackheads and whiteheads. Also helps in nourishing and hydrating your skin. Eye-care is often neglected by many people in their 20s, however, the use of under-eye serums are not only useful for people with dark circles and wrinkles but can help all types of skin to restore and prevent damage. A detoxifying and brightening under eye serum with anti-inflammatory properties can instantly boost your look and brighten your eyes. Inflammation is very heavy with people who have sensitive skin. Regular use of serum with anti-inflammatory properties can reduce redness, dryness and prevent your skin from further damage and make your skin look fresh and well moisturized. Moisturizing serums help reduce fine lines, wrinkles, and blemishes on your skin. Usually, such serum contains retinol which is highly efficient in the treatment of skin elasticity, wrinkles, and uneven skin tone. Also helps in the reduction of spots, blemishes, hydration, and nourishment of the skin.^[33]

Plump skin and create a more youthful look — When your skin is able to retain moisture, it has that plump, healthy look that's au naturel when you're young. To keep that going over the long haul, incorporate ingredients such as vitamins and essential oils.

VIII. MARKETED PRODUCTS

1 Biotique Dandelion Anti-Ageing Serum

With nutmeg oil and pure dandelion, which have high vitamin E and mineral content, this is the best whitening serum for the face. Suitable for daily use, it helps to lighten dark spots and leaves the skin glowing. Among the best face serums in India, this one removes wrinkles and other skin imperfections to leave your skin looking flawlessly glowing.



Figure No. 9

2. TruSkin Naturals Vitamin C Serum for Face

The serum has a potent anti-ageing composition best suited for eradicating wrinkles, fine lines, and other facial symptoms. You will have bright, clean, smooth skin with science that encourages collagen production. This face serum has natural and organic components that make it soothing to the skin while reducing all age scars, acne, and breakouts, making it suitable even for the most sensitive skin types.



Figure No. 10

3. Radha Beauty Vitamin C Serum

Use the vitamin C serum from Radha Beauty for a younger and healthier face. This anti-ageing product also reduces fine lines and wrinkles, leaving your skin smooth, clean, and soft. To successfully treat acne, age spots, or skin irritation, apply it all over your face and neck. A prominent antioxidant serum in India, this aids in preventing sun damage and gives your skin a youthful, fresh, and revitalised appearance.



Figure No. 11

4 O3+ Radiant Oxygenating Facial Serum

This OZ+ Radiant Serum, which contains oxygen molecules that function as efficient skin varies, will give you incredibly bright skin. It's the best serum in India. It is a powerful antioxidant that promotes skin brightness. This serum also enhances the natural radiance of the skin. It works great as a foundation for normal to oily skin types before applying makeup. This paraben-free product efficiently whitens the skin on the face, leaving you with bright, uniformly toned skin that is also lighter.



Figure No. 12

5. Good Vibes Rose Hip Radiant Glow Face Serum

It contains almond oil to minimize puffiness and rosehip oil to increase collagen development. It regulates sebum production, while sesame oil protects the skin from UV rays. Vitamin E also protects the skin from oxidative damage. This serum's cleansing and hydration mixture are ideal for all skin types.



Figure No. 13

6. Jovees Herbal Vitamin C Face Serum

The Jovees herbal serum revives dull skin and improves its texture and brightness. With this lightweight, you can combat the fine lines of ageing. It is rich in Vitamin C and natural fruits, making your skin young. This serum penetrates

your skin to provide nourishment and a glow. Your skin's hydration is greatly aided by the serum's inclusion of grape seed extract. It reduces hyperpigmentation and black spots on your skin.



Figure No. 14

7..Minimalist 10% Niacinamide Face Serum

Try the Minimalist Niacinamide 10%+ Zinc serum for blemish-free skin. An aloe-based formula with niacinamide boosts protein synthesis, improves skin tone, and inhibits melanin production. Zinc is added to regulate sebum, reduce inflammation, and smooth the skin. Oily, acne-prone, and blemish-prone skin types can use this pH-balancing serum safely in their daily skincare regimes.



Figure No. 15

8. StBotanica Retinol 2.5% + Hyaluronic Acid Face Serum

The St. Botanica Retinol 2.5% E & Hyaluronic Acid Professional Facial Serum is intended to lessen dryness and protect your skin from damage and ageing by UV exposure aggressors. It contains 2.5% retinol, which promotes cell regeneration and repair while also halting premature ageing for skin that appears younger. The hyaluronic acid in this serum attracts and keeps moisture in the skin.



Figure No. 16

9. L'Oréal Paris Revitalift 1.5% Hyaluronic Acid Face Serum

This L'Oréal Paris hyaluronic acid serum is a dermatologist-recommended remedy for plump, radiant, and supple skin. It is driven by 1.5% hyaluronic acid, a potent humectant that can hold up to 1000 times its weight in water and seal moisture to the skin. It profoundly penetrates the skin to moisturize and make it supple and smooth. [29]



Figure No. 17

IX. CONCLUSION :

The aim of this report was to study about what exactly are facial serums and their history along with their overall importance. The study includes its proper selection and correct sequence of application. With tremendous amount of serums available in the market for each and every skin type and skin problem these days, it's essential for one to know what they are looking for in a serum precisely. When a righteous formulation is selected by scrutinizing every major skin issue, it is safe to say that significant improvements can be seen, leading to good results. Skin health is a crucial element of the altogether health of the body and having a proper skin care routine with an accurate serum for you, can sustain the ageing skin and ward off the ongoing damage. It eliminates fine lines, wrinkles, dark spots, and further blemishes if paired with appropriate moisturizer and sunscreen. Specific ingredients deal with a certain skin concern, as a result a combination of all the finest ingredients could show miraculous benefits. The

report also shows numerous skin care brands for serums available in the market and a brief description of each product. This concludes that a facial serum is a boon for the cosmetic community and it's addition is crucial in the skin care regime.

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