



Comprehensive Guide To Eczema : Diagnosis, Prevention and Treatment

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Abstract:

Eczema, also known as atopic dermatitis, is an inflammatory chronic skin disease seen in millions of people around the world. Eczema is an inflammatory condition marked by pruritus, erythema and skin lesions which can have a serious effect on a person's quality of life. This extensive review allows to obtain a high level of understanding on eczema, covering its aetiology, presenting symptoms, diagnosis, prevention and treatment modalities.

It further goes on to refer to various types of eczema, such as atopic dermatitis, contact dermatitis, dyshidrotic eczema, neurodermatitis, nummular eczema, seborrheic dermatitis and stasis dermatitis. In reference to different factors known to induce the development of eczema, it gives consideration to genetics, environment, allergies, and even immune system disorders.

Diagnosis of eczema involves a history taking, physical examination and a range of laboratory tests that include allergy testing, blood testing and skin biopsy. The guideline provides a summary of diagnostic criteria and differential diagnosis of eczema.

The treatment of EC is complex and involves lifestyle intervention, topical corticosteroids, immunomodulators and phototherapy. The systematic review reports the range of available treatments, including moisturizing agents, topical steroids, and systemic immunosuppression.

Along with the disease's medical treatment, the guide also suggests making lifestyle modifications, such as good skin care practices, avoiding triggers, and stress management. Patient education and support are also very significant in the treatment of eczema.

On recent advances in the field and research studies on eczema, this guide finds its culmination with the coming of new treatments such as JAK inhibitors and hopefully skin bacterial transplant therapy among others. More

importantly it emphasizes on continued studies involving pathogenesis and mechanisms regarding eczema so treatment can better this condition further.

Overall, this integrative review presents a general overview of the etiology, diagnosis, prevention and treatments of Atopic dermatitis, thereby serving as a useful resource for patients with Atopic dermatitis, caregivers and clinicians.

1.Introduction:

Eczema and atopic dermatitis are two terms which are often There is overlap in the usage of eczema and atopic dermatitis but for their meaning there is a distinction. The very word eczema originates in the Greek language from the word to boil out the content the term infusion and means it is an inflammatory process covering two layers the epidermis and the dermis which starts with redness,itching, papules and vesicles, then weeping, oozing,room and crusting, followed by scaling, lichenification and if commas added pigmentation making each distinct over time.Eczemas recommence with sorting of types by clinical type of eczemas by their responsive pattern to treatment potential, reason and other findings present. So, atopic dermatitis is in fact a type of eczema.

This comprehensive guide to eczema aims to provide a clear and practical resource for individuals living with the condition, caregivers, and healthcare professionals alike. By exploring the latest research, prevention strategies, diagnostic tools, and treatment options, this guide seeks to empower readers with the knowledge needed to effectively manage eczema and improve overall skin health.

2.Literature and review:

These are resources that give information about eczema.

A Comprehensive Review of the Treatment of Atopic Eczema

This review summarizes recent literature on the management of atopic eczema (AE) and provides a treatment guideline. It discusses the importance of basic treatments like cutaneous hydration and avoiding aggravating factors. It also discusses the use of topical calcineurin inhibitors and biologics as promising therapies.

Atopic Dermatitis - StatPearls - NCBI Bookshelf

This resource answers questions about treatment planning for atopic dermatitis (AD), for example, with the use of cyclosporine. It also deals with monitoring patients for nonmelanoma skin cancer and serum lipid levels.

Systematic review of treatments for atopic eczema

This review contains evidence for the use of various treatments for atopic eczema, including oral cyclosporin, topical corticosteroids, psychological approaches and ultraviolet light therapy.

Background and aims - Systematic review of treatments for

In this chapter, the predisposition to eczema will be discussed primarily focusing on genetics; twin studies are discussed to show that concordance is much higher in identical twins. Also, it touched on the role of environmental factors including house dust mites, bacteria, and hard water.

3.Aim and Objective:

3.1 Aim- Comprehensive Guide To Eczema : Diagnosis,Prevention and Treatment

3.2 Objective-

Many treatments for eczema have two objectives: reducing the itch and rash, on one hand, and healing the barrier function of your skin, on the other. These are good starting points in formulating your goals for eczema treatment. But eczema treatment is very much one-size-does-not-fit-all.

4.Diagnosis of Eczema:

4.1 Clinical Representation

Signs and Symptoms-Symptoms

The most common symptom of eczema is unbearable itching. The severity of the rash caused by eczema varies with the stage of the condition:

During an acute rash, the skin is reddish and extremely itchy. Blisters may appear on the inflamed areas of the skin. These can easily rupture and then ooze (leak liquid).

The rash gradually heals in the aftermath of the acute stage. The skin dries out and peels.

The treated skin might become thicker, rougher and even crack over time.

Furthermore, you can have acute and less acute rashes simultaneously on different parts of your body.

Eczema is a fluctuating condition.

This means that the symptoms sometimes improve and sometimes worsen. They can also disappear completely for a period. The inflammation of the skin is permanent only occasionally.

In infants, eczema most often has an impact on the cheeks as well as the outer sides of the arms and legs and – to a smaller extent – the back, tummy and chest. In youngsters, teenagers, and adults, it primarily occurs behind the hollows of the knees, elbows, and the back of the neck. It

is itchy and can sometimes also occur on the palms of the hands and soles of the feet. Only in rare cases it occurs on the face.

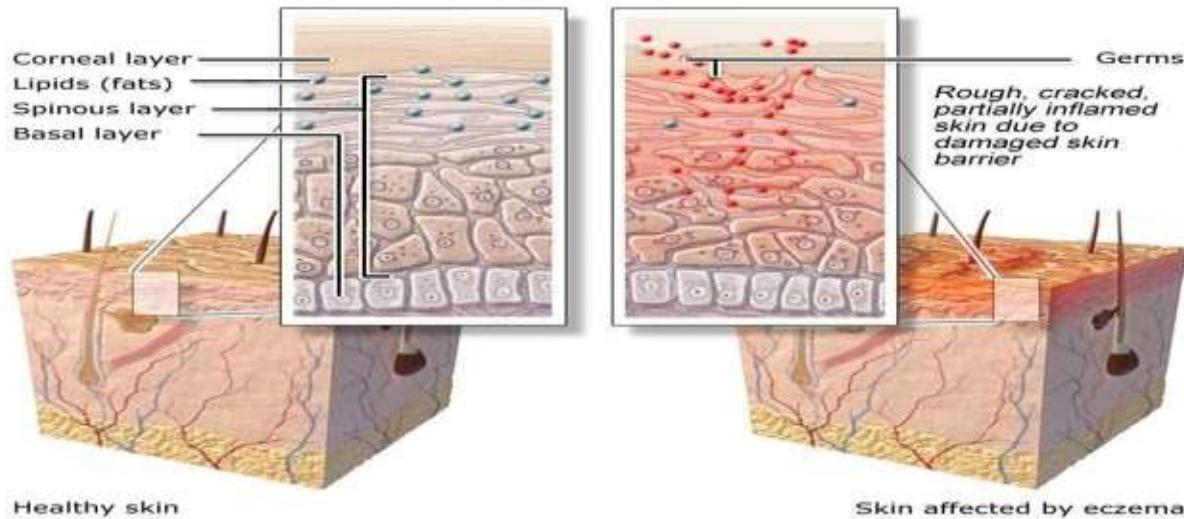
5.Causes of Eczema:

The skin has three layers; the outer, or epidermis, layer

Middle layer (dermis)

Subcutaneous tissue Inner layer

The outer layer also has layers: the basal layer, the spinous or prickle-cell layer, and the corneal or horny layer (enlarged in the diagram below). The corneal layer-the visible part of the skin-prevents microorganisms from entering the body. This layer is constantly renewed because new cells are always growing from the basal layer



Left: Normal skin, right: Skin with eczema

Due to the inflammation of the skin, the corneal layer does not provide the required protection in patients with eczema. This helps irritants, germs, and all those things that people are allergic to while entering the body.

Eczema can also be caused by other factors. These include immune system disorders and microorganisms ("bugs") that live on or in your skin, along with genetic changes in certain genes - specifically one known as the FLG gene. This gene inhibits the production of filaggrin, a protein integral to the proliferation of the outer layer of skin. Since there is a lack of filaggrin, the balance of fats in the skin is disrupted, and it loses a lot of moisture. The extent of the influence of the range of factors and how each inter-links are not well known.

In about 30-40% of all those with eczema, it is associated with an allergy (atopic eczema). They are also more prone to more severe symptoms and to having asthma or hay fever as well.

The immune system reacts to allergens by producing antibodies that cause inflammations in the skin. In atopic eczema, these inflammations can be caused by antibodies that are detectable in the blood. Allergens that play a role in eczema sometimes include dust mites, pollen, or foods like milk, eggs, nuts, or fish.

These environmental factors and other substances that are not allergens can irritate the skin. Examples include: rough fabrics (such as scratchy wool) rubbing against the skin, cigarette smoke, and intense heat or cold.

6.Types of Eczema:

There are various forms of eczema, and the main kinds of eczema are:

6.1 Atopic Dermatitis: This is a most common type of eczema. It causes dryness in the skin, itching, and inflamed patches. It is most common in children but can be at any age.

Diagnostic features

Eczema is diagnosed by clinical features: inÂdefined erythematous, scaly and pruritic lesions associated with a clinical history of early onset, flexural inflammation (although sites other than flexures are normally affected in early life), background of generalised skin dryness

(xerosis with or without ichthyosis vulgaris) and related atopic disease in the patient and/or first degree relatives.it can happen at any body site but in atopic patients the skin as a whole organ reveals a dysfunction of barrier function and predisposition to inflammation, even in clinically uninflamed sites. Barrier dysfunction also presents as dryness in part due to increased water loss, and susceptibility to viral and bacterial infections.

future directions

Recent advances in the understanding of genetic and environmental factors in eczema pathogenesis open the way for huge progress in this direction. The wide range of phenotypes within the clinical diagnosis of "eczema" points to a necessity for an approach of personalized medicine, aimed at directing new therapies towards subsets of patients whose disease is caused by specific pathways. New insights into tissue microbial diversity and their role

It also opens an opportunity for the modulation of inflammatory disease with therapeutic manipulation of microbial communities in the future.

Systemic immunosuppressive therapy:

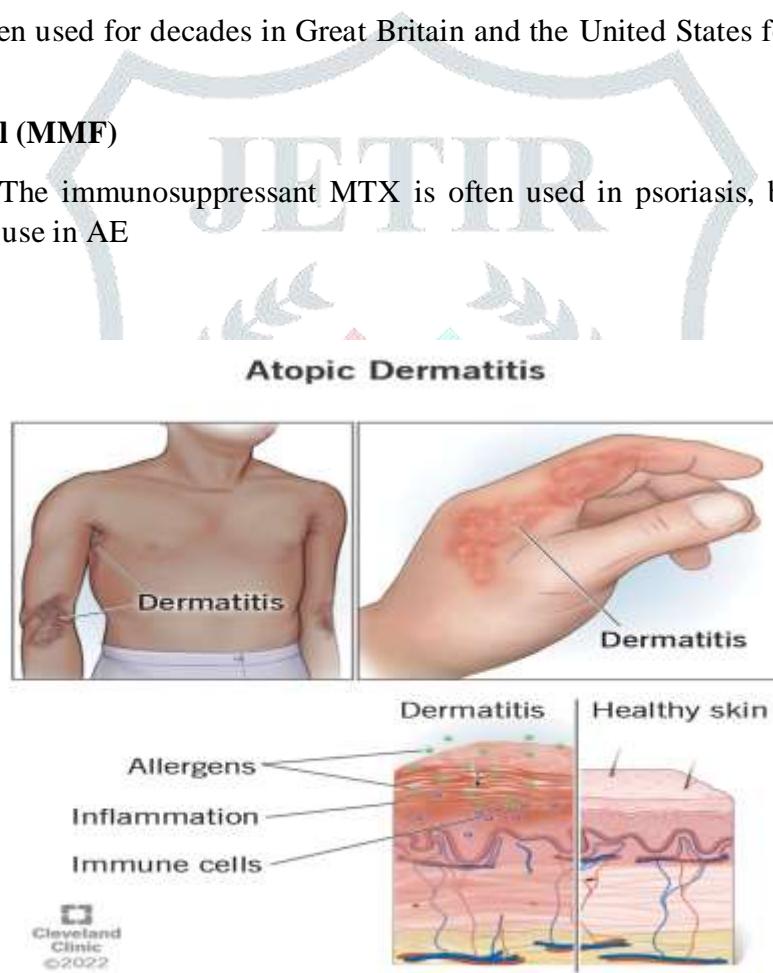
Oral glucocorticosteroids-It has also been used by many European countries as oral glucocorticosteroid.of AE treatment

Ciclosporin A-Ciclosporin is prescribed in most European nations as a treatment of AE.

Azathioprine-It has been used for decades in Great Britain and the United States for the treatment of AE in adults.

Mycophenolate mofetil (MMF)

Methotrexate (MTX)-The immunosuppressant MTX is often used in psoriasis, but there are only sparse published reports on its use in AE



(Atopic Dermatitis)

6.2 Contact Dermatitis : Otherwise known as allergic contact dermatitis, this kind of eczema is environment triggered. It is a kind of itchy rash arising from touching something you are allergic to.

6.3 Dyshidrotic Eczema:

Also known as pompholyx, blisters and rashes can characterize the condition where there is burning sensation on the skin areas of the palmar and the soles of the feet.

6.4 Neurodermatitis: Also referred to as discoid eczema, this is the development of small scaly patches that are itchy on the skin of the head, forearms, wrists, and lower legs.

6.5 Nummular eczema:

It is also known as nummular dermatitis, and usually, causes the small rounded lesions on the whole body but especially at the arms and legs.

6.6 Seborrheic dermatitis:

The inflammatory eczema type occurs on the scalp. Once it appears at the scalps, it's known as dandruff

6.7 Stasis dermatitis:

Discoloration in the leg, kind of like varicose veins. It's mostly a sign of circulatory disorder.

7. History Assessment:

The doctor will assess a detailed history of the patient on the following:

When and where the rash appears

How often the rash appears

Morbidity of itching

Family history of eczema

Personal history of eczema

Personal history of dry skin

Personal history of asthma or allergic rhinitis

Whether there exist contact allergens and

Other precipitating factors

Other important considerations

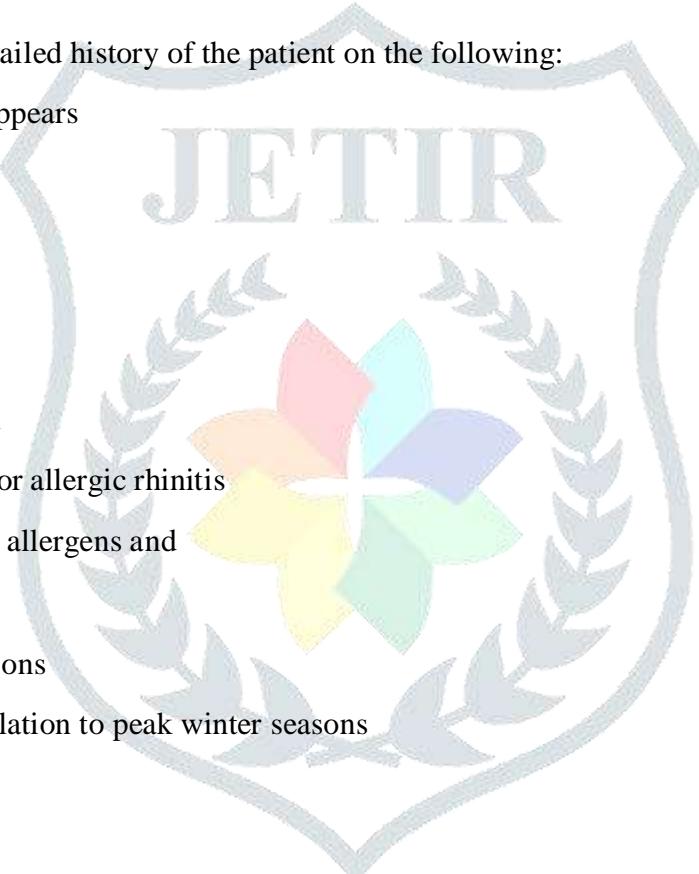
The time of dermatitis in relation to peak winter seasons

The frequency of bathing

The soap types used.

Diet

Medications



8. Physical Examination:

A physical examination for eczema will include a visual inspection and palpation of the skin to assess skin and tissue texture, thickness, and tenderness:

Visual inspection -A dermatologist will study the location, pattern, and appearance of the rash. The rash may also appear as erythematous papules, excoriations, or lichenification that occurs due to thickened skin. Depending on one's age, the distribution of the rash may differ.

Palpation-He will touch the skin to determine the texture and thickness and sensitivity to pain.

Wooden spatula-The doctor may gently scrape away flaky skin and scabs with a wooden spatula in order to see the skin underneath. This spatula can also be used to identify eczema by rubbing the skin hard. It is eczema if, upon rubbing, the skin whitens rather than reddening.

Glass spatula-A glass spatula can also be pressed against the skin to establish the real skin pigmentation. The doctor will also ask some other regions;

When the symptoms began

Where in the body the rash is

Is the rash continual or does it come, and then fade?

Is there a pattern of when the rash appears

Are there any family members that have been diagnosed with eczema

Products for personal hygiene being used

A doctor may, therefore, refer a patient to the dermatologist for treatment of eczema.

9. Diagnostic Criteria:

Eczema is diagnosed by a medical history and physical examination and sometimes with the help of other tests to eliminate other diseases:

9.1 Medical history

A detailed medical history remains the most important tool in diagnosing eczema. He or she will ask for when and where the rash appears, how often it occurs, and other symptoms. That's not all-he or she might be asking about possible triggers, such as foods, allergens, changes in temperature, or specific elements in the patient's home and workplace. Physical exam

A healthcare provider will look at the patient's skin. The rash can appear differently in different people, but it could be pink, red, purple, brown or gray. The distribution of the rash also varies with age.

9.2 Other tests

A healthcare provider may order other tests to confirm the diagnosis, like:

Allergy test

Blood tests to rule out other causes of the rash

A skin biopsy to tease out one form of dermatitis from another

Other elements that may also be considered in the diagnosis include:

Personal history of dermatitis, dry skin, asthma, or allergic rhinitis

Onset of symptoms before age two

Writing down what you have been experiencing helps trace back the time when the symptoms started and how long they lasted, and also identify factors that provoke or worsen it. In addition, you can enumerate any medicines, vitamins, supplementations, and herbs taken.

10. Differential Diagnosis:

There are many differential diagnoses for eczema, which may include the following:

Psoriasis: flat-topped, reddish plaques with silvery scales that are less pruritic, well-circumscribed

Allergic contact dermatitis: an eczematous rash that occurs at a site related to a topical allergen

Seborrheic dermatitis: red lesions with greasy scales that have sharp margins

Fungal infection: an annular patch or plaque with a central clearing and a slightly raised border and sometimes with scales on it.

Scabies or other infestations: An itchy rash that just started in a family

Drug reactions: Bullous and eczematous forms

Infectious disease: A possible differential diagnosis for eczema

Inflammatory disease: A possible differential diagnosis for eczema

Immunodeficiency problem: A possible differential diagnosis for eczema

Nutritional deficiency: A possible differential diagnosis for eczema

11. Laboratory Tests:

A dermatologist can run a wide range of laboratory tests to diagnose eczema, including:

Blood tests

Measure very high levels of eosinophils and IgE antibodies associated with eczema. An allergy panel test can also measure the amount of IgE antibodies produced against specific allergens.

Skin biopsy

A small piece of skin will be removed and examined under a microscope to rule out other diseases that can cause skin affliction.

Patch test

Small spots applied to the skin that carry allergens are necessary to determine the causes of eczema flare-ups.

Oral mucosa swabs

Cells extracted from the lining in your cheek are subjected to mutation searches in the Filaggrin gene, which leads to eczema.

Prick skin tests

It is used in identifying food or environmental allergies that can be associated with eczema.

12.Treatment of Eczema:

Eczema is chronic- that is, there is no cure. But proper skin care and medication can keep the itching and rash at bay. The main treatment options are:

Basic treatment with lipid-replenishing and moisturizing products (emollients): These are applied lavishly over the skin at least twice a day to prevent it from drying out. This eliminates itchiness, guards the skin against microbes and irritants, and prevents flare-ups.

Avoid irritants: The skin can be sensitive to certain things, such as scratchy wool, cleaning agents, and some contact allergens (in people who have an allergy to them). It is helpful to avoid such irritants as much as possible. Extreme temperatures can affect the skin too.

Topical steroid creams: There are a variety of topical steroids that can be applied to the skin to treat flare-ups. These steroid creams are very effective for their ability to help decrease the itchiness and inflammation of the skin. Individuals who have frequent flare-ups might be interested in the "weekend treatment," or intermittent treatment, in which a steroid cream is applied to the affected areas of skin on two days of the week in addition to the basic treatment. This can really cut down on flare-ups.

Pimecrolimus and tacrolimus: Other drugs used in the treatment of eczema include pimecrolimus and tacrolimus. These drugs can be applied as cream or ointment to the skin for longer term use on sensitive areas such as the face and neck, etc.

A combination of treatments, light therapy (phototherapy) with UV light, can be used if these are not sufficient, for example, on very severe eczema or large areas. If that's not enough then some immunosuppressive reactions of the immune system can be suppressed by taking tablets.

Sometimes other medicines like antihistamines, the allergy medicines, have been used to relieve itching. However, research has now proven that they don't relieve symptoms of eczema.

People may try plant-based products or dietary supplements, such as evening primrose oil or borage oil or vitamins and zinc. There is no scientific evidence that they work either. That's also true of other treatments, like laser therapy or allergen immunotherapy. So they aren't endorsed by medical societies.

13. Lifestyles and Non-Pharmacological Measures :

There are a number of lifestyle and non-pharmacological measures that are also helpful in managing eczema, such as;

Moisturizing : Applying moisturizer frequently, ideally after bathing or showering.

Bathing : One or two lukewarm baths or showers a day. A mild, non-soapy cleanser only should be used. Bleach added to the water should be avoided unless recommended by a physician.

Clothing: Loose, light-colored, airy; natural fibers cotton, linen, silk, bamboo; avoid tight-fitting tight, scratchy or synthetic like wool, polyester

Stress management: Notice how you cope and how you handle the event of a stressful occurrence

Hydration: Pack at least eight glasses of water a day

Avoid allergens: Keep away from irritants and allergens such as dust mites, seasonal pollens, and pets.

Prevention of sweating: Avoid any activity that induces sweating, since sweating might dry out your skin and exacerbate the itching.

Avoiding sudden temperature and humidity changes: This helps in preventing shivering, which may aggravate the condition.

Short fingernails: Keep your fingernails short to prevent scratching.

Use of Humidifier: Ensure that an area where you spend most of your time does not have low humidity. You can use a humidifier to maintain the desired level of humidity.

Oral medication Use oral allergy or anti-itch medication. Examples of these include cetirizine (Zyrtec Allergy) or fexofenadine (Allegra Allergy).

14.Psychological Support (Counseling for stress management):

Counseling for stress and other psychological therapies can help individuals with eczema gain control over stress and eczema flare:

Psychological counseling: A professional psychotherapist will be able to deeply assist you to discuss issues that could be causing your stress.

Anti-anxiety drugs: Depending on the level of stress you are experiencing, anti-anxiety drugs can be useful for people who have the condition of eczema.

Relaxation therapy: Deep breathing, yoga, guided imagery, and even progressive relaxation are helpful in relaxing.

Biofeedback: This will help those who cannot really control their scratching.

Support groups: Online or in your locality, you can join a support group where you can connect with others having eczema.

Other ways to reduce stress and eczema include the following:

Good sleep hygiene

Getting adequate exercise

Eating a healthy diet and staying hydrated

Replacing negative habits with positive ones.

Finding time for activities that bring joy

Breaks during the day

15.Prevention of Eczema:

15.1Primary Prevention

Breastfeeding (if possible)

Yes, some things that help prevent breastfeeding problems in the first place can be done if you have eczema, like:

Apply expressed breast milk or edible oils: These can be rubbed on to your nipples as a preventative measure.

Ensure good latch: Generally, most problems are prevented by ensuring the baby is latched well.

Apply heat: You may apply heat to your breasts before you plan to nurse or pump.

Use steroid creams or ointment: Apply steroid creams or ointment around your nipple or areola, and then gently rub them off before feeding. For sore nipples, consult a health professional. Alternatively, use of nipple shields, hydrogel pads, or pain relievers / NSAIDs can be employed.

Early Introduction of Allergenic Foods

Yes, early introduction of allergenic foods may benefit infants with atopic dermatitis who are at high risk for a food allergy:

When to introduce

Introduce peanut-containing foods as early as 4 to 6 months of age in infants with severe atopic dermatitis or with egg allergy. For infants with mild-to-moderate atopic dermatitis, introduce appropriate peanut-containing food around 6 months of age.

What to introduce

Introduce egg, then other potential allergens, including peanuts, tree nuts, and sesame seeds. How to introduce Introduce foods in age-appropriate forms, such as puréed fruits and vegetables. Avoid whole tree nuts and large globs of peanut butter, which are potential choking hazards.

15.2 Secondary Prevention

The secondary prevention for eczema modifies the course of the disease. Other forms of prevention for eczema can also be articulated in the following way:

Applying of emollients: Emollients can be applied every 4–6 hours. It helps prevent the occurrence of eczema flare-ups and makes the skin less sensitive to irritants such as soaps and detergents.

Avoid triggers: Many allergens and irritants may cause eczema. Some common allergens include dust mites, eggs, peanuts, milk, fish, soy, rice, and wheat. Common irritants would include chemicals, heat, soaps, humidity, acrylic, and wool.

Management of stress: Eczema is generally known to be triggered by stress, so managing stress and its emotional triggers is quite important. Some ways to manage stress are done through the techniques of autogenic training, massage, and cognitive-behavioral therapy.

Using topical steroids: After clearing the disease, you can use topical steroids twice weekly.

To Wring out freshly washed new clothes.

16. Skincare Routines:

Essential skincare routine for eczema might include:

Moisturizing

Use a fragrance-free, hypoallergenic moisturizer immediately after bathing or showering when your skin is still damp. You can also moisturize at other times when your skin feels dry. Thick creams and ointments are better than lotions.

Bathing and showering

Shower for a short time, maybe 5–10 minutes, in lukewarm water. Hot water can make itching worse.

Cleansing

Use a gentle, non-soap cleanser or medical emollient. Soap can irritate the skin.

Sun protection

Apply a physical sunblock with zinc oxide or titanium dioxide to act as a barrier against the UV light.

Testing new products

Apply a new product on a quarter-sized area of the inner forearm and observe the response for 7-10 days before you begin using it.

Avoiding known irritants

Avoid using fragrances, essential oils, ethanol or alcohol, propylene glycol, urea, retinoids, cocamidopropyl betaine, and lanolin.

Wearing good eczema clothing

Eczema-friendly clothing and laundry detergent

Wet dressing and mitts

Wear wet clothing or dressings and trap moisture in. Fingerless mitts can be used on hands or wrists.

Environmental Modifications

Some environmental changes that could potentially prevent eczema include the following:

Minimize contact with triggers: If your eczema is triggered by pollens, smoke, or mold you might be able to:

Wear a mask and reduce time outdoors during peak levels

Shower and change clothes as soon as you come indoors

Close all windows and doors while inside

Install a HEPA air filter

Observe pollen: Measure and season the amount of pollen in the air and correlate it with severity of symptoms

Reduce humidity: The incidence of eczema is inversely related to indoor relative humidity

Increase rainfall: Greater mean annual precipitation is associated with higher prevalence of eczema

Eat fish: Fish is a source of n-3 polyunsaturated fatty acids, which may have an anti-inflammatory effect

Avoid gluten: Some people find that gluten worsens eczema

17. Patient Education and Support:

Patient education and support about eczema, also known as atopic dermatitis, can help the patients better understand their condition as well as the things that are required to manage it. This results in higher patient empowerment as well as may lead to better health outcomes.

Ways on educating the patients with eczema:

Educate them that

Patients can learn about eczema from online programs, apps, and patient education materials. UpToDate provides patient education materials that vary from general overviews to more details. Self-management interventions

Patients can be taught how to take care of their condition by themselves using self-efficacy-based interventions. Parental education

Parents and caregivers of children with eczema can be educated about the ways of taking care of the condition. Follow-up care encourages

Patients should make and attend all appointments and call their doctor if they are having problems.

17.1 Monitoring and Follow –Up

Here are a number of ways through monitoring and follow-up on eczema:

Skin moisture

This is a system that estimates the severity of the eczema by applying skin moisture sensor. The measurement is about the reflected response to an electromagnetic wave; it can be a microwave or optical light.

Neural network systems

Classification of eczema using neural network system together with the assessment of lesions severity. Patients can use the camera available in their mobile phone to check their condition remotely.

Patient-reported symptom monitoring

Apply weekly patient-reported symptom monitoring.

Care coordination

Healthcare team members must communicate and coordinate to manage and follow-up patients.

18.Recent Advances and Research:

Advances in understanding pathophysiology

Recent work on eczema, also called atopic dermatitis, or AD has included:

Genetic factor

There is a common mutation in the FLG gene that produces the skin's protective layer which will result in a defective barrier to the skin.

Defect of the skin barrier

It is an important part of the pathogenesis of AD and results from a deficiency in filaggrin, a protein that forms a substantial skin barrier.

Immune mechanisms

AD is an inflammatory skin disease with a systemic component and immune mechanisms are involved in its pathogenesis .

Th2 cytokines

IL-4, IL-13, and IL-31 are the Th2 cytokines responsible for the AD pathology.

Microbiome

Skin microbiome is one factor for the onset of AD, and interventions targeting it might help to address the disease early.

Adult onset

AD might persist into adulthood; adult-onset AD is a distinct clinical phenotype.

19.Future and Directions:

future of eczema therapy

In contrast, skin bacterial transplant (SBT) is associated with the transfer of diversified cutaneous flora from one individual to another. Recently, SBT has been termed as the "future of eczema therapy".

Future Treatment of Eczema JAK inhibitors

Apart from abrocitinib and upadacitinib that have been approved for use by the NHS, there are several other JAK inhibitors treatment plans in the pipeline, which are set to be released soon. Some are also already available in the form of creams to treat mild to moderate eczema like ruxolitinib

new research about what causes the eczema

A new study from UC Berkeley School of Public Health has found that sodium intake is higher with a greater risk for developing atopic dermatitis, commonly referred to as eczema.

20.Conclusion:

Eczema, or even more specifically, atopic dermatitis is the most common inflammatory skin disease in children and adults, but the resultant symptoms of this make them itch very intensely and develop lesions on their skin. Strict management was required to ensure proper diagnosis and individualized plans of treatments along with lifestyle changes to enhance quality-of-life status.

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