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Review Article

A SYSTEMIC REVIEW ON SKIN CONDITIONS ASSOCIATED WITH DIABETES

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ABSTRACT

Diabetes is a chronic (long-lasting) health condition that affects how your body turns food into energy. Most of the food you eat is broken down into sugar (also called glucose) and released into your bloodstream. When your blood sugar goes up, it signals your pancreas to release insulin. Insulin acts like a key to let the blood sugar into your body's cells for use as energy. If you have diabetes, your body either doesn't make enough insulin or can't use the insulin it makes as well as it should. When there isn't enough insulin or cells stop responding to insulin, too much blood sugar stays in your bloodstream. Over time, that can cause serious health problems, affecting most of the organs of the human body especially the skin as it is the largest organ of the Human body

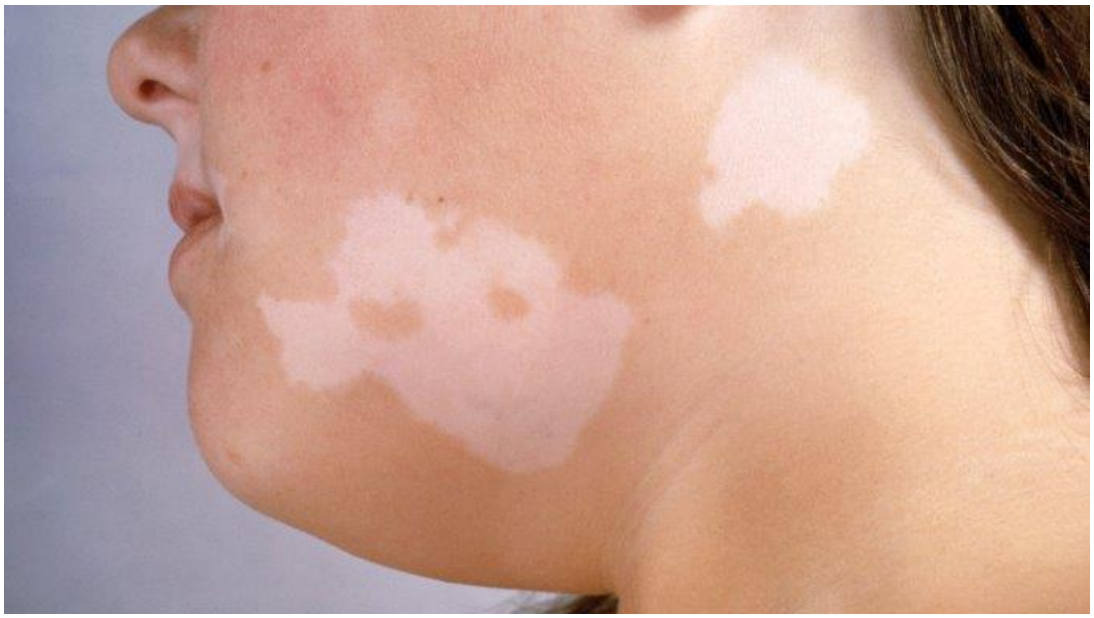
Keywords: Diabetes, Blood glucose, Obesity, insulin resistance, pathogen.

INTRODUCTION

Diabetes is the most common endocrine disorder, affecting 8.3% of the population. [1] Skin disorders will be present in 79.2% of people with diabetes. [2] In the last 20 years, the number of adults diagnosed with diabetes has more than tripled. As there isn't a cure yet for diabetes, yet it is important for Patients and Practitioners to understand the disease infectivity and their associated treatments. Some skin problems can be warning signs of diabetes in those who are undiagnosed. The good news is that most skin problems with diabetes can be prevented or treated easily if they're caught early. As increase in blood glucose means open invitation to Pathogens (Bacterialand Fungal). For a healthy skin it's important to maintain a good diet and nutrition which in turn increase human immune system and helps in preventing and curing this skin conditions. Skin conditions are sometimes the first sign of the diabetes. Increase in blood glucose tends to reduce blood flow to the skin. Decreased blood circulation can lead to changes in the skin's collagen. This changes the skin's texture, appearance, and ability to heal. Damage to the skin cells can even interfere with your ability to sweat. It can also increase your sensitivity to temperature and pressure. Some glucose-lowering medications may also increase the risk of developing diabetes-related skin problems. People with type 2 diabetes should be watchful for changes in their skin injuries or irritation to the skin surrounding insulin injection sites cuts or wounds that are slow to heal (slow healing wounds are often entryways for secondary infections), or appear infected

Vitiligo:

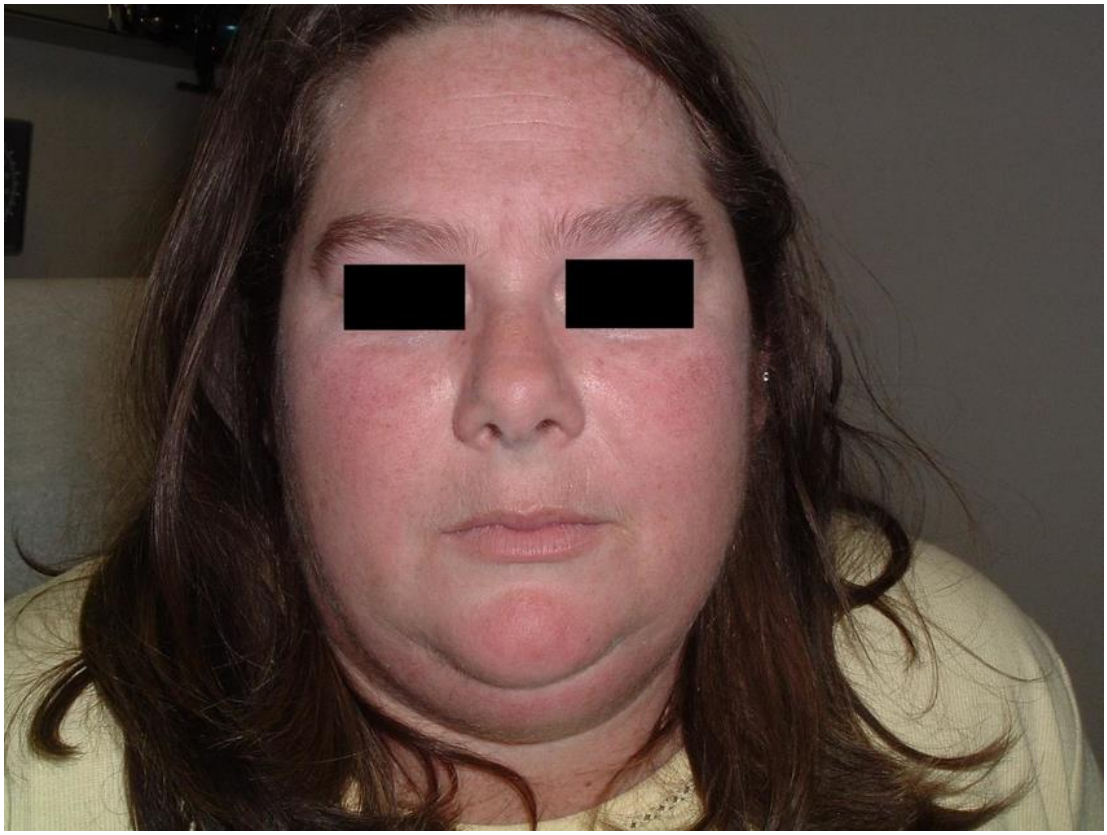
It is a skin problem in which the skin cells that make melanin (brown pigmentation) are destroyed, leading to irregular, blotchy patches that often occur on the hands, face, or chest. Although the cause of vitiligo is unknown, it is believed by experts that an autoimmune condition like diabetes tend to cause it. [3] Cure hasn't been found for neither of these two diseases, but light therapy and steroids are used to manage vitiligo. It's important to wear a sunscreen of at least 30 SPF, since depigmented skin has no natural sun protection.



Vitiligo

Rubeosis Facei:

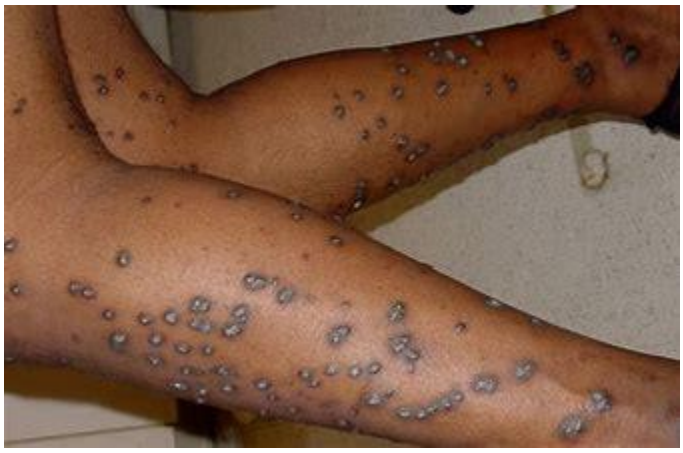
Rubeosis facei (RF), a relatively common skin manifestation associated with diabetes, is a microangiopathic complication. It may go unnoticed by patients and physicians. However, if recognized, it should alert physicians to look for other microangiopathic complications such as retinopathy [4] RF presents as a flushing to the face. This condition is seen in 3–5% of people with diabetes. The appearance of RF correlates with poor glucose control. No treatment is needed. Strict glycemic control can improve the appearance and prevent complications of microangiopathy in other organ systems [5]



Rubeosis Facei

Acquired Perforating Dermatosis:

These are dome-shaped papules and nodules with hyperkeratotic plugs. This condition is characterized by the transepidermal elimination of some component of the dermis. The lesions are most commonly seen on the trunk and extremities and tend to be pruritic. This condition has been found to be associated with both types of diabetes type 1 and type 2 [6]. Treatment for this conditions include avoidance of scratching, topical or systemic steroids, phototherapy, retinoid, and antihistamines. Dialysis has not shown therapeutic value, but renal transplant has been shown to be effective in clearing the lesions [7].



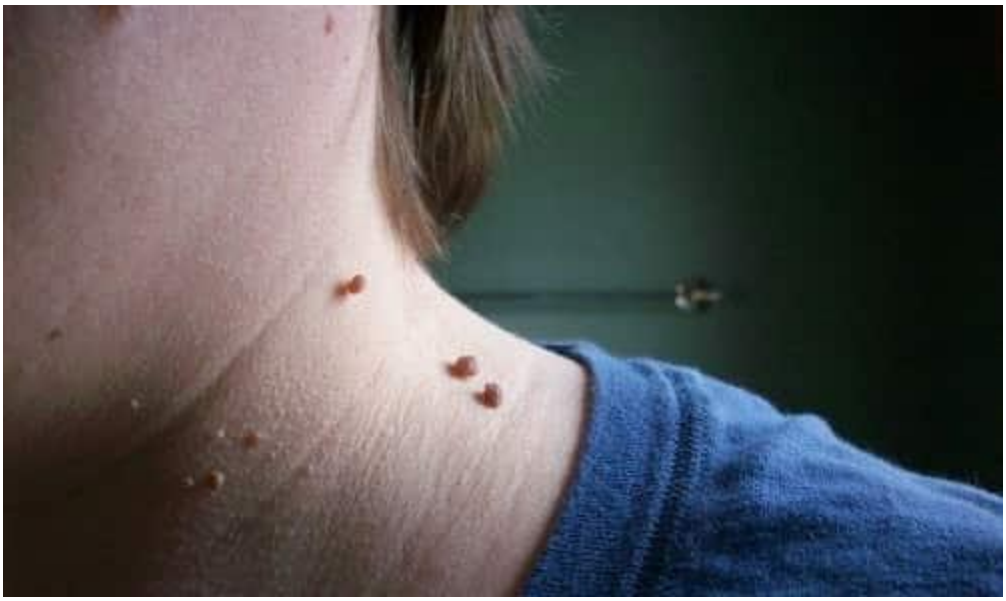
Acquired Perforating Dermatosis

Bacterial Infections:

Bacterial infections are common for everyone but these kinds of infections are especially problematic for people with diabetes. These skin conditions are often painful and warm to the touch, with swelling and redness. They may increase in size, number, and frequency if your blood glucose level is chronically elevated. The most common bacteria that cause skin infections are *Staphylococcus*, or staph, and *Streptococcus,* or strep. Staphylococcus are more common and more serious in people with diabetes which is not under control. These bacteria can result in 'boils', an inflamed nodule from a hair follicle, which can occur in areas where hair follicles can be irritated Other infections include styes, which are infections of the glands of the eyelids, and bacterial nail infections. Most bacterial infections require medical treatment with antibiotics in the form of pills and/or creams. serious bacterial infections can cause deep tissue infections called carbuncles. These may need to be pierced by a physician and drained. Immediate so you may be treated with antibiotics. Other common bacterial infections include: boils, infected sties (infections around the eyes), folliculitis (infections of the hair follicles) infections around the fingernails and toenails.

Skin Tags:

Skin growths that hang from a stalk. These growths are most common on the eyelids, neck, armpit, and groin. While harmless, having numerous skin tags may be a sign that you have too much insulin in your blood that is diabetes. [8] They are found in ~25% of adults, and their number and prevalence increases with age. [9] Treatment is usually cosmetic or for cases involving irritation. Excision may be performed with forceps, fine-grade scissors, cryosurgery with liquid nitrogen, or electrodesiccation [10].



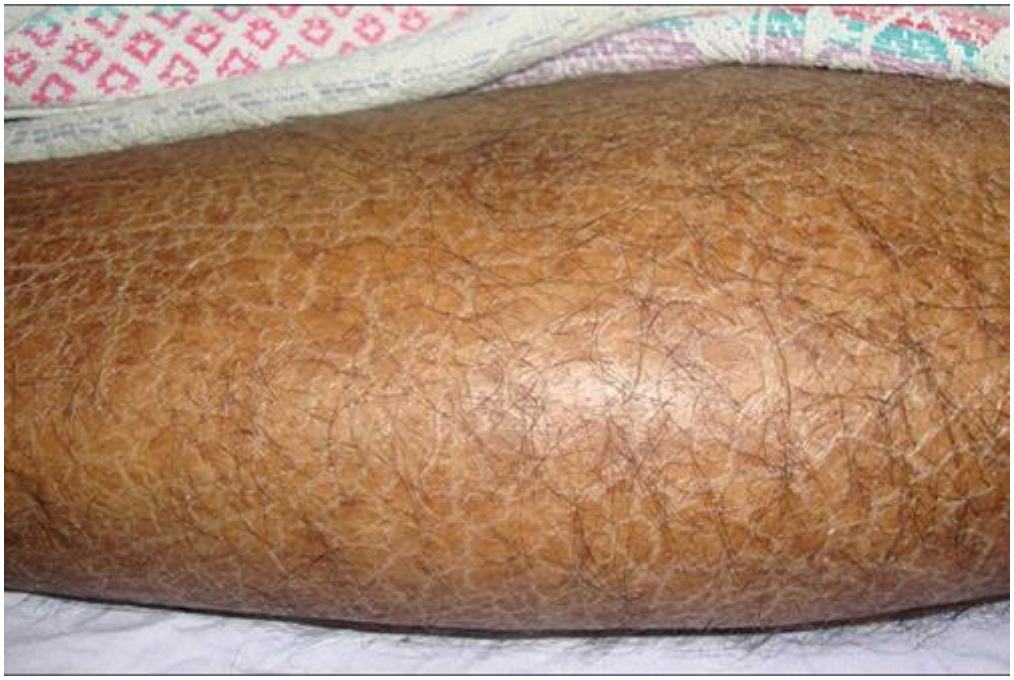
Skin tags

Xanthelasma:

These are yellow colored patches around eyelids, occurs when the fat levels in the bloodstream are at an extreme high, common in diabetic patients.

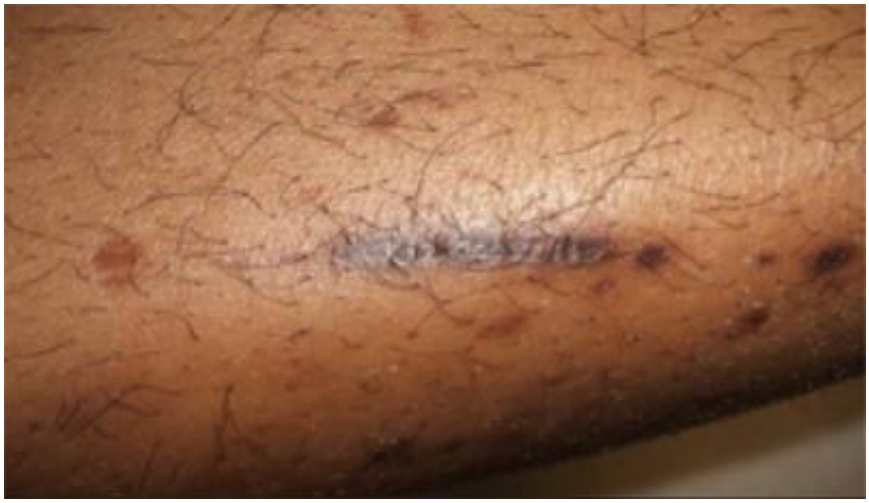
Xerosis:

Xerosis is another name for dry skin. It is the second most common skin manifestation in people with diabetes. [11] Taking good care of skin's hygiene, appling fragnance-free creams or lotions within 3 minutes of bathing to trap moisture within skin is helpful in this condition.



Diabetic Dermopathy:

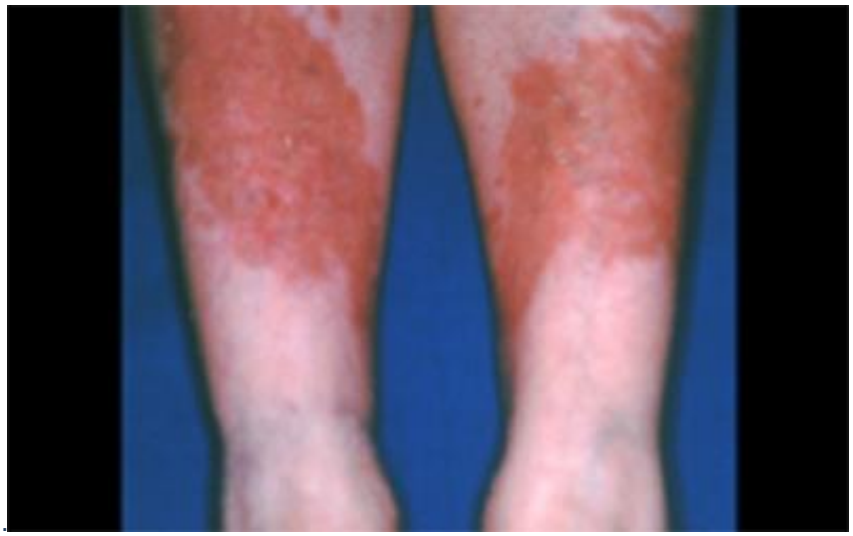
Also known as "shin spots, the hallmark of this condition consists of light brown, oval, or circular scaly patches of skin, often occurring on the shins. Mostly misdiagnosed as aging spots. Unlike age spots, these spots and lines usually start to fade after 18 to 24 months by leaving atrophic hypopigmentation at the site of origin. [12] Diabetic dermopathy can also stay on the skin indefinitely. These patches are caused by damage to the small blood vessels that supply the tissues with nutrition and oxygen. This skin problem is harmless and does not require treatment. However, it often doesn't go away, even when blood glucose is controlled. A higher incidence of this condition is seen in patients who also have retinopathy, neuropathy, or kidney disease.



Diabetic Dermopathy

Necrobiosis Lipoidica Diabeticorum (NLD):

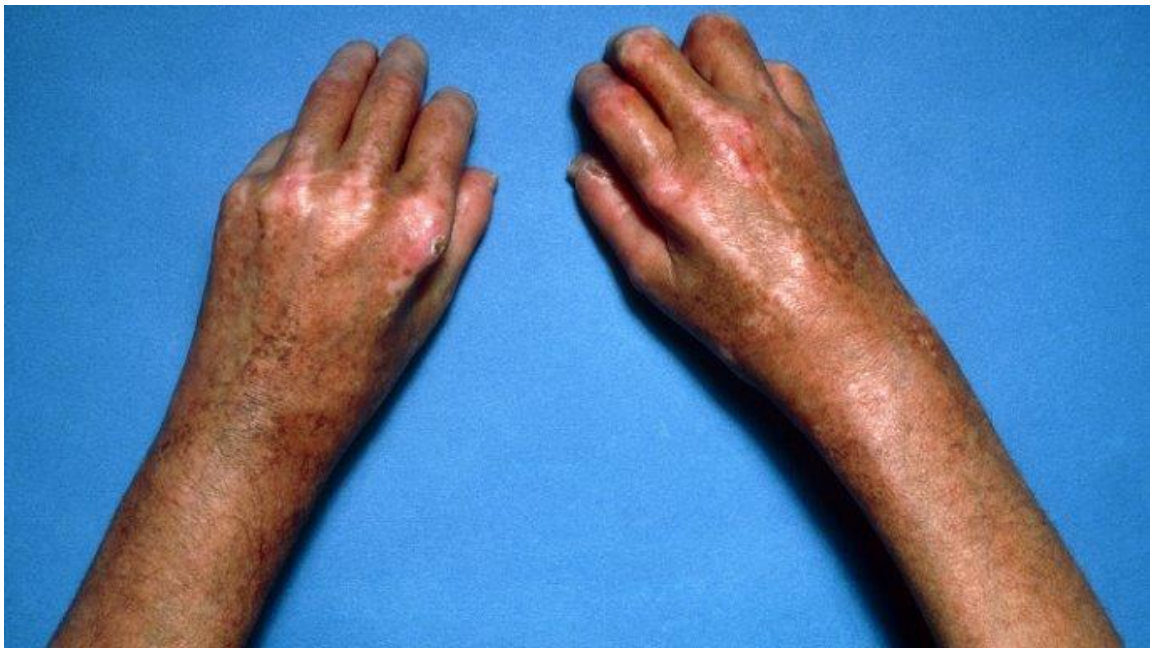
Is thought to be caused by changes in the blood vessels, collagen and fat content underneath the skin. Overlaying skin area becomes thinned and reddened. Blood vessels under the skin may become easier to see. Sometimes NLD is itchy and painful. Sometimes the spots crack open most lesions are found on the lower parts of the legs and can ulcerate if subjected to trauma. [13] Lesions have fairly well defined borders between them and normal skin. Light brown, oval, and circular patches are also a hallmark of NLD. This condition is rarer than diabetic dermopathy. In the case of NLD, though, the patches are often larger and fewer. Over time, NLD skin patches may appear shiny with a red or violet border. They are usually itchy and painful. As long as the sores do not open, no treatment is required. It affects adult women more often than men**,** [14] and also tends to occur on the legs



Necrobiosis Lipoidica Diabeticorum (NLD)

Digital Sclerosis:

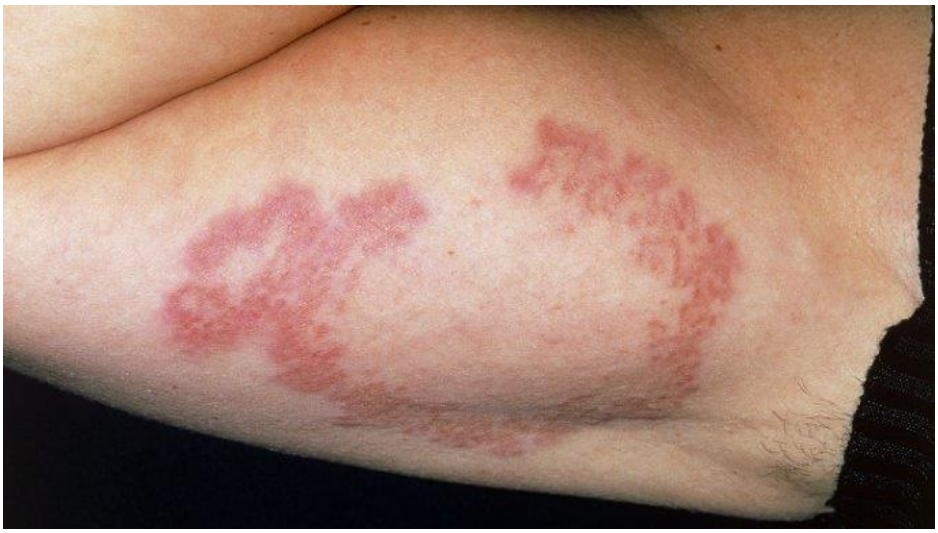
This skin condition causes the skin on hands, fingers, and toes to become thick, tight, waxy, and potentially stiff in the joints. If diabetes has been poorly controlled for years, it can feel like you have pebbles in your fingertips, sometimes this skin problem occurs on the toes and forehead as well. Rarely, knees, ankles, or elbows may stiffen. Elevated blood sugar can increase the risk of developing digital sclerosis. Lotions, moisturizers, and regulated blood sugar levels can help prevent or treat this condition.



Digital Sclerosis

Disseminated Granuloma Annulare:

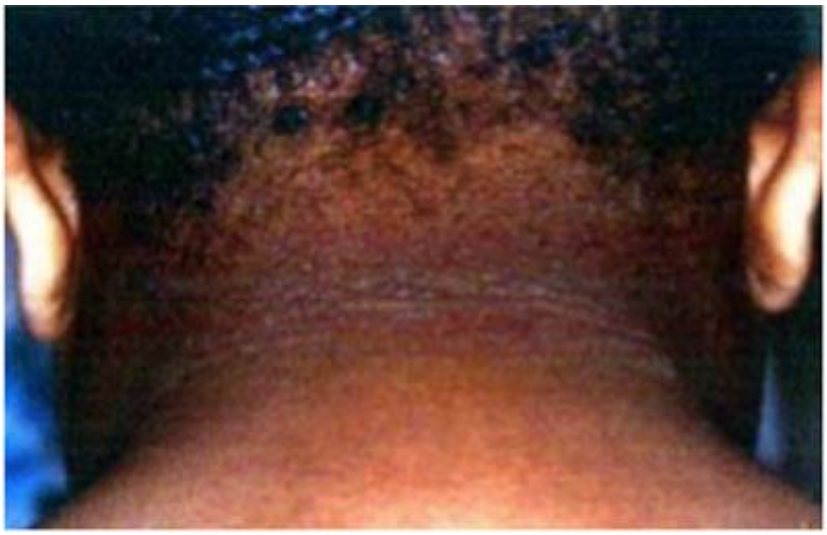
These red or skin-colored raised bumps look like sharply defined, ring or arc-shaped areas on the skin, rashes and commonly appear on the hands, feet, fingers and ears, but they can also occur on the chest and abdomen. They may be itchy**.** [15] They are harmless, and medications are not usually needed as rash usually disappears on its own without leaving scars. [16] But sometimes treatment with topical steroid medication, such as hydrocortisone is needed.

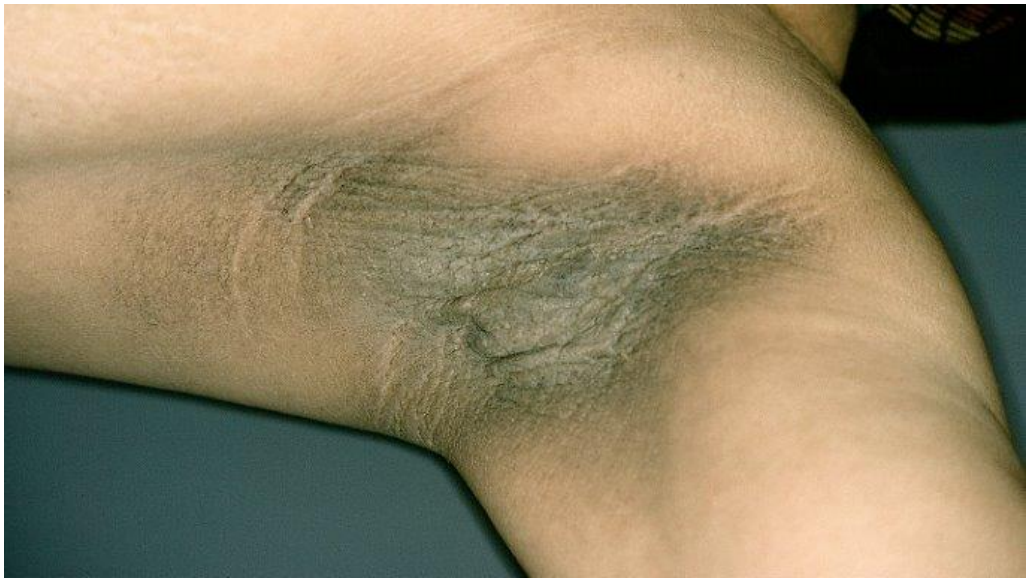


Disseminated Granuloma Annulare

Acanthosis Nigricans:

Usually means that there is too much insulin in human body and appears before diabetes is diagnosed. [12] This is a skin condition in which skin in body folds and turns the skin creases dark, thick, and velvety seen on the neck, groin, armpits, elbows, and knees. It typically affects people who are obese**.** [17] This condition sometimes goes away when a person loses weight. Topical or systemic retinoids and topical retinolytics may be used to manage symptoms. [18]



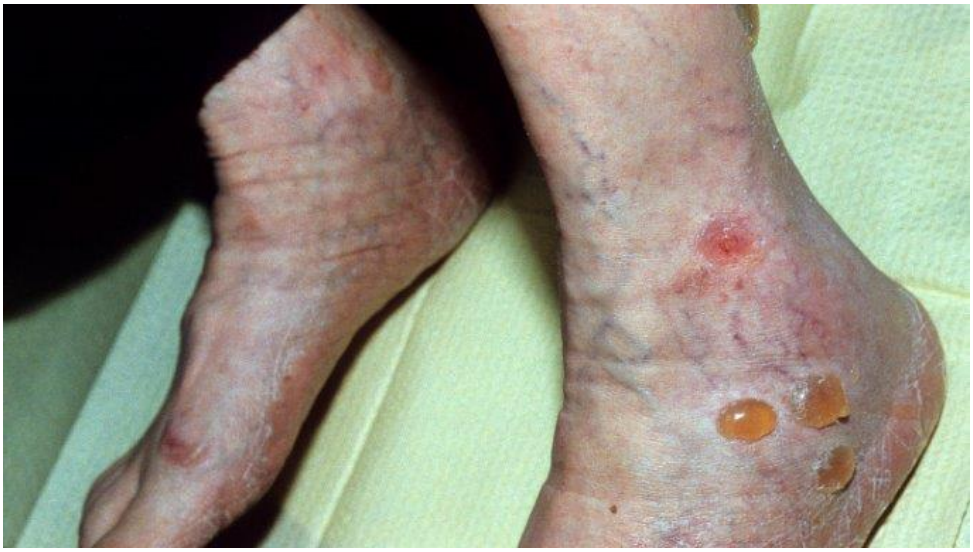


Acanthosis Nigricans

Diabetic Blisters:

Also called as Diabetic bullae are rare but are distinct marker for diabetes**,** [19] these blisters can occur on the fingers, hands, toes, feet, legs, or forearms. Appears to occur more commonly in men than women and between the ages of 17-84 years, Blisters can be from 0.5 to 17 centimeters in size. [20] They often have an irregular shape. Two types of diabetic bullae have been defined.

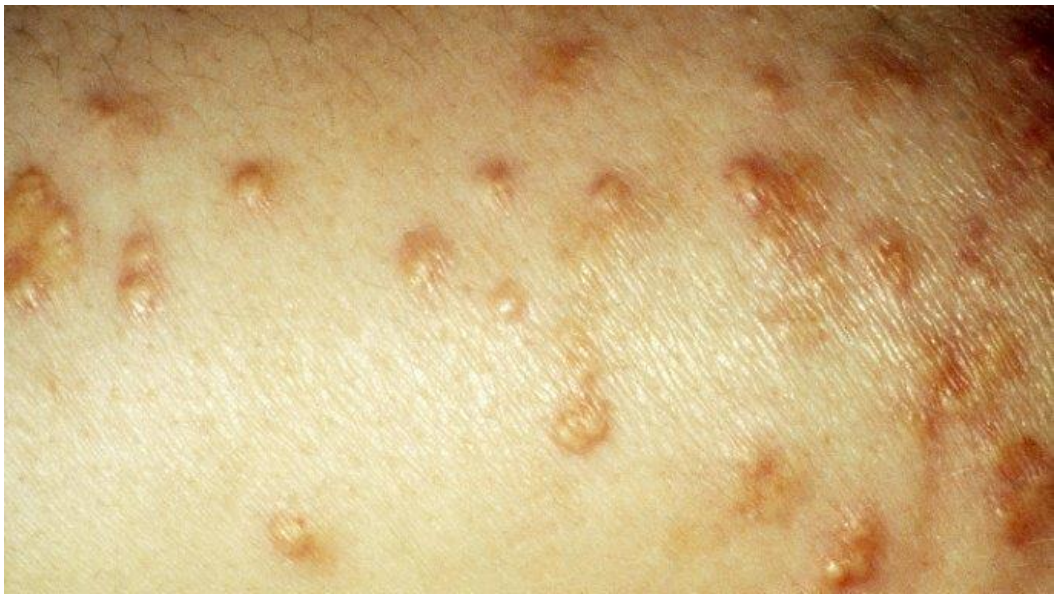
1. Intra- epidermal bullae – these are blisters filled with a clear, sterile viscous fluid and normally heal spontaneously within 2-5 weeks without scarring and atrophy.
2. Sub epidermal bullae – these are less common and may be filled with blood. Healed blisters may show scarring and atrophy. In most cases diabetic bullae heal spontaneously without treatment and are not painful. [21] Patients should make sure the blister remains unbroken to avoid secondary infection.



Diabetic Blisters

Scleroderma diabeticorum: While rare, this skin problem affects people with type 2 diabetes**,** [22] causing a thickening of the skin on the back of the neck and upper back. Women are found to be affected more than men. [23] Some treatment options include steroids, methotrexate, and ultraviolet light phototherapy. [24] Lotions and moisturizers may help soften skin.

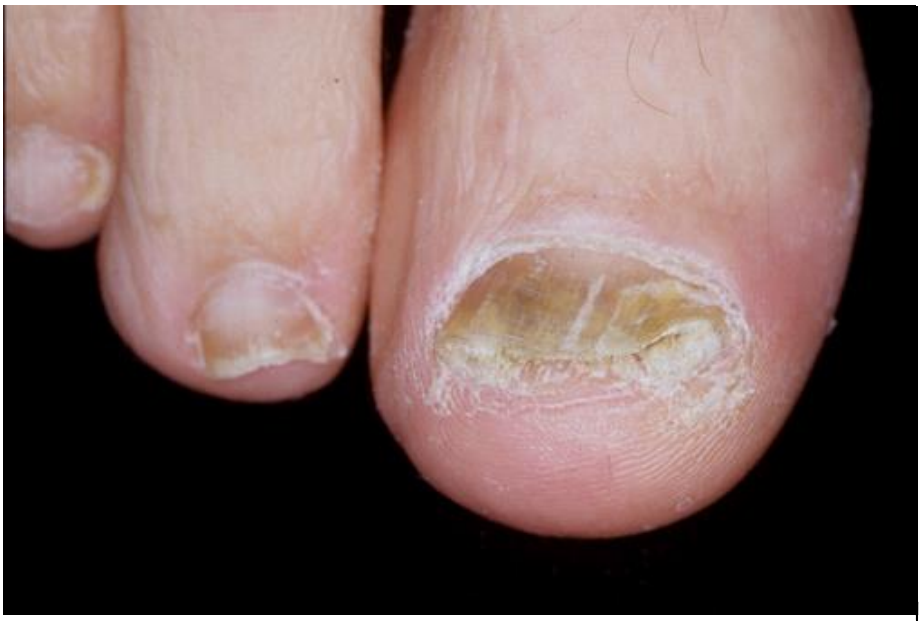
Eruptive xanthomatosis: This skin condition is tender and itchy and may occur when blood sugar levels are not well controlled and when triglycerides rise to extremely high levels. [25] This skin problem usually strikes young men. Severe resistance to insulin makes it difficult for the body to clear the fat from the blood. With extreme elevations in these blood fats people are at risk for pancreatitis, an inflammation of the pancreas. Eruptive xanthomas appear as firm, yellow, waxy pea-like bumps on the skin. The bumps -- which are surrounded by red halos and are itchy -- usually are found on the face and buttocks, [26] They also can be seen on the back side of the arms and legs as well as in the creases of the extremities. Treatment for eruptive xanthomatosis consists of controlling the level of fats in your blood. [27] The skin eruptions will resolve over a few weeks. [28] Drugs that control different types of fats in the blood (lipid-lowering drugs) may also be needed.



Eruptive Xanthomatosis

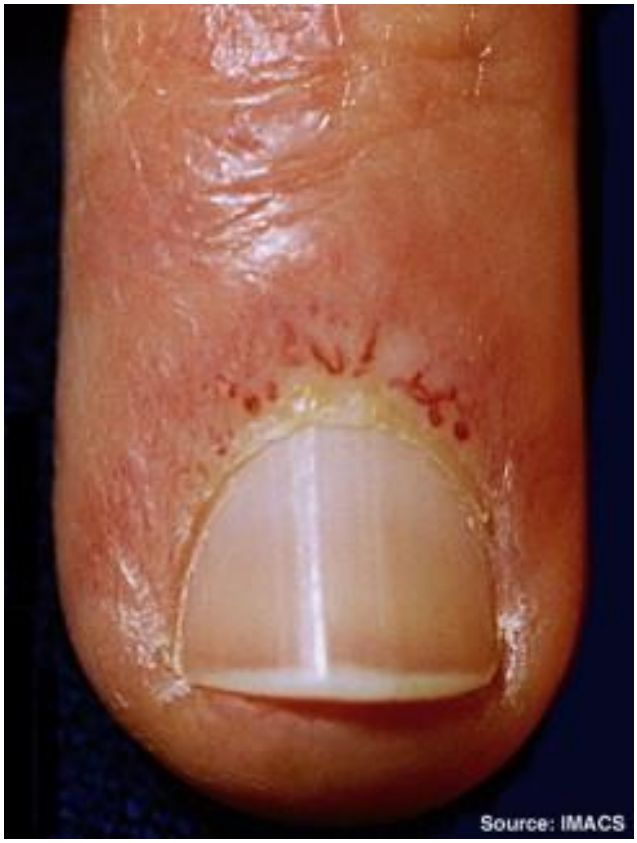
Onychodystrophy:

Onychodystrophy presents as excessive nail thickening and deformity, which may cause accumulation of debris and subsequent infection of the toe that should be treated as a diabetic ulcer. Poorly fitting shoes may cause repeated trauma and worsening of the injured site. [29]**] In** patients with diabetes, onychodystrophy is the result of poor peripheral circulation and diabetic neuropathy. The condition itself may cause diabetic foot ulcers, [30] Proper nail care, well-fitting shoes, and immediate attention to nail infections are important.



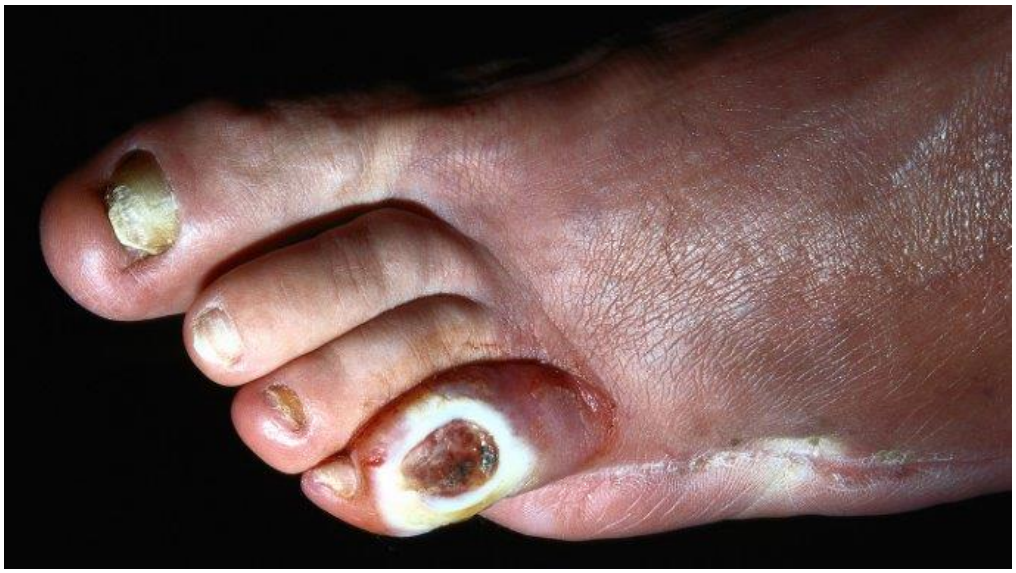
Periungual Telangectasias:

Periungual telangectasias present as nail fold erythema, dilated blood vessels visible to the naked eye, fingertip tenderness, and thick cuticles. Telangectasias arise in the nail beds of people with diabetes after loss of capillary loops and dilation of remaining capillaries. [31] Some patients also experience fingertip tenderness. No treatment is necessary for this condition.



Diabetic Neuropathy and Foot Ulcer:

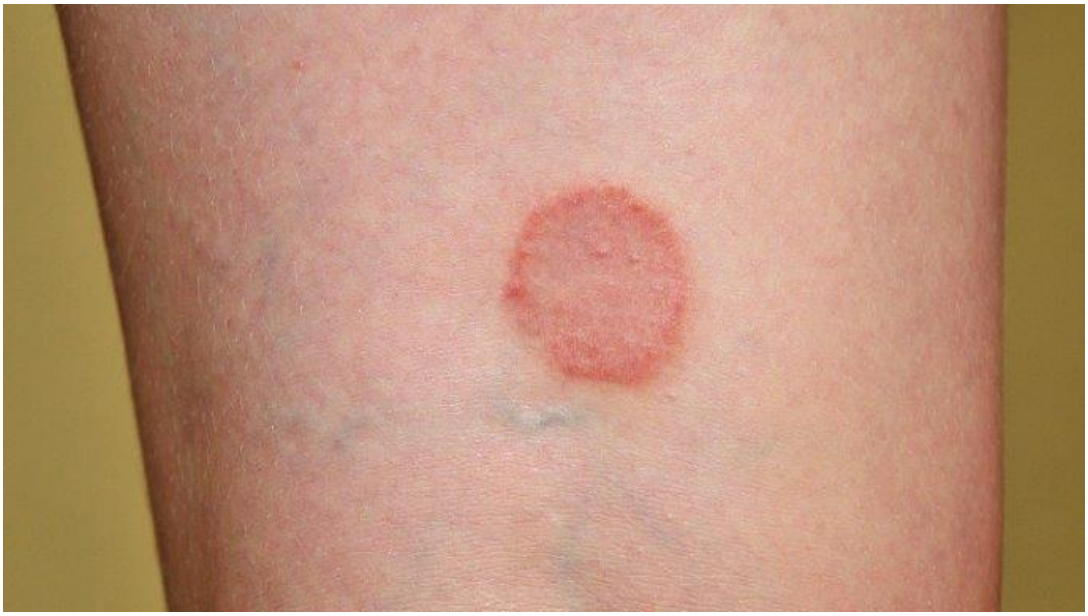
Diabetes can cause nerve damage called neuropathy a common diabetes complication. Sometimes the damage causes a loss of sensation in the feet. If you step on something and injure your foot or develop a blister, you may not be able to feel it. An open skin sore called a foot ulcer can develop and could get infected.



Foot Ulcer

Fungal Infections:

Fungal infections, caused by the spread of fungus or yeast, are also common for all diabetes patients. Yeast infections look like areas of red, itchy, swollen skin that are surrounded by blistering or dry scales, sometimes also covered with white, “cottage cheese”-resembling discharge. Yeast fungus thrives in the warm folds of the skin, under breasts, in the groin, in the armpits, in the corners of the mouth, and under the foreskin. Common skin irritations like athlete’s foot, jock itch, and ringworm are fungal infections. They can itch, spread, and worsen if not treated with prescription medication. A yeast-like fungus called "candida albicans" is responsible for many of the fungal infections causing skin problems in people with diabetes. Women in particular are prone to infection with this fungus in the vagina. Other commonly seen areas of infection include the corners of the mouth with what is known as "angular cheilitis," which feels like small cuts on the corners of the mouth. Fungus also can occur in between the toes and fingers and in the nails (onychomycosis). [32] This fungus creates itchy, bright red rashes, often surrounded by tiny blisters and scales. These infections most often occur in warm, moist folds of the skin. Three common fungal infections are- jock itch (red, itchy area on the genitals and the inside of the thighs), athlete’s foot (affects the skin between the toes), and ringworm (ring-shaped, scaly patches that can itch or blister and appear on the feet, groin, chest and abdomen, scalp, or nails). Medicines that kill the fungus are usually needed to treat these infections. A rare but potentially fatal fungal infection with Mucormycosis is seen in people with diabetes. [33] The infection usually starts in the nasal cavities and can spread to the eyes and brain.



DISCUSSION

Most of the skin conditions are related to changes in the small blood vessels. This supply nutrition to the skin tissues. When long-term diabetes isn't well-controlled, skin problems can occur. Itching is the most common problem of poor blood supply, when poor blood flow is the culprit, the lower legs may be the itchiest part of the body. Though there is no cure for diabetes, there are a variety of treatment options that include lifestyle changes, over-the-counter and prescription treatments, and alternative remedies that can help manage the condition. Over-the-counter remedies are available for certain types of skin disorders associated with diabetes. These remedies include-hydrocortisone, nonprescription antifungals, like clotrimazole topical steroid medications (mild hydrocortisone). Some skin conditions are severe enough that medical attention and prescription medications are required. Prescription medications and treatments available include-antibiotics (topical or oral) to treat skin infections stronger antifungal medications insulin therapy to help regulate the origin of skin conditions. Alternative Remedies are also available for those who aren't interested or don't need prescription medications, alternative remedies are available for those with diabetes-related skin problems. These alternative remedies include-talcum powder where skin touches other parts of the skin (armpit, behind the knees) lotion to soothe dry skin can reduce itching aloe vera used topically (not orally) Lifestyle Changes though sometimes genetics and other factors come into play, being overweight and inactive can have an effect on diabetes. Lifestyle changes that can help manage diabetes include-following a healthy diet, including eating more fruits, vegetables, and whole grains, maintaining an exercise program, aiming for 30 minutes of cardio, 5 days a week, monitor your blood sugar, Lifestyle changes that can help specifically with diabetes-related skin problems include: avoid and actively prevent dry skin avoid scratching dry skin, which can create lesions and allow infections to set in treat cuts immediately keep your home humid during dry months avoid hot baths or

showers, as they can dry skin out. Luckily, most skin conditions can be prevented or easily treated if caught early.

CONCLUSION

It is very important for a diabetic patients take aggressive care of their skin and health in general, For the skin, moisturization, checking feet and legs daily for any blisters, sores, and skin breaks (especially between the toes), and nail care is extremely important. Nail and foot fungus can lead to skin cracks and breaks, allowing bacteria to enter and cause infection. As well as timely intake of prescribed medication and understanding that even all-natural herbal supplements can interfere with medicine you're currently taking is necessary to tackle with these associated conditions.

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