# AUTOIMMUNE DISEASES

# Introduction

-- **Women** get autoimmune diseases at a rate of more than **2 to 1** compared to men — 6.4% of women versus 2.7% of men.

-- The disease often starts during **childbearing age** (ages 15 to 44).

-- Some autoimmune diseases are more common in **certain ethnic groups.**

For example, lupus erythematosus affects more African American and Hispanic people than white people.

-- Certain autoimmune diseases, such as multiple sclerosis and lupus erythematosus, **run in families**.

-- Not every family member will necessarily have the same disease, but they **inherit a susceptibility** to an autoimmune condition.

-- Because the incidence of autoimmune diseases is rising, researchers suspect **environmental factors** like infections and exposure to chemicals or solvents might also be involved.

-- Eating **high fat, high-sugar**, and **highly processed foods** are thought to be linked to inflammation, which might set off an immune response.

| | |
|---|---|
| **High fat:** | more than 17.5g of fat per 100g |
| **High sugar:** | candies, cakes, cookies, pastries |
| **Highly processed:** | sugary beverages, chips, cookies, cakes, ice cream |

## Systemic and localized autoimmune diseases

**Autoimmune diseases** can be broadly divided into **systemic**, and **organ-specific** or **localized** autoimmune disorders, depending on the principal clinico-pathologic features of each disease.

1. **Systemic** or **non-organ specific** autoimmune diseases include **scleroderma** (skin and connective tissue disease) and **rheumatoid arthritis** (painful swelling in joints).

2. **Local** or **organ specific** may be **endocrinologic** (diabetes mellitus type I etc.), **dermatologic, haematologic** (autoimmune hemolytic anemia), **neural** (multiple sclerosis) or can involve virtually any body tissue.

# Comparison of organ specific and non-organ specific autoimmune diseases

| | Organ specific | Non-organ specific |
|---|---|---|
| Antigen | localized to given organ or tissue | widespread distribution throughout the body |
| Lesions | confined to target organ or tissue | multiple organs / tissues affected;<br><br>immune complexes deposit in joints, skin and kidneys |
| Overlap | with other organ specific antibodies and diseases | overlap with other non-organ specific antibodies and diseases |
| Examples | autoimmune thyroid disease (Grave's; Hashimoto's)<br>myasthenia gravis<br>pernicious anaemia<br>diabetes mellitus | SLE<br>rheumatoid arthritis<br>systemic sclerosis<br>systemic vascultitis |

## Common autoimmune diseases

There are more than **80** autoimmune diseases. Following are most common ones:

1. **Type 1 diabetes:**

-- The **pancreas** produces the hormone **insulin**, which helps regulate blood sugar levels.

-- In type 1 diabetes mellitus, the immune system attacks and **destroys insulin-producing cells** in the pancreas.

-- **High blood sugar** can damage the **blood vessels and organs,** including the heart, kidneys, eyes, and nerves.

## 2. Rheumatoid arthritis (RA):

-- In rheumatoid arthritis (RA), the **immune system attacks the joints.**

-- This attack causes **redness, warmth, soreness, and stiffness** in the joints.

-- Unlike osteoarthritis, which commonly affects people as they get older, RA can start **as early as 30 years of age** or sooner.

Osteoarthritis is the degeneration of joint cartilage and the underlying bone, most common from middle age onward. It causes pain and stiffness, especially in the hip, knee, and thumb joints.

## 3. Psoriasis/psoriatic arthritis:

-- It is due to malfunctioning of immune system.

-- Normally, skin cells grow and then shed when they're no longer needed.

-- Psoriasis causes **skin cells to multiply too quickly**.

-- The extra cells build up and form **inflamed, red patches, commonly with silver-white scales** on lighter-toned skin.

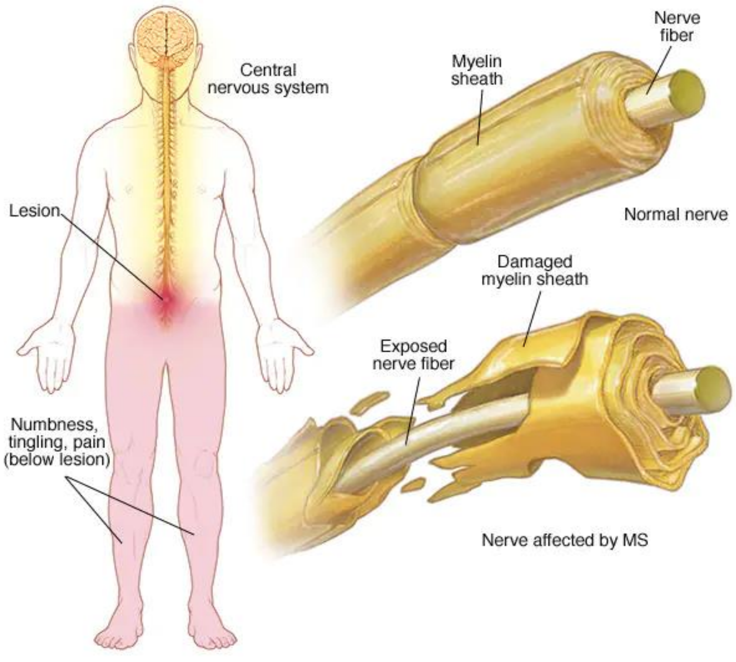
-- On **darker skin**, psoriasis can appear purplish or dark brown with gray scales.

-- Up to 30% of people with psoriasis also develop **swelling, stiffness, and pain in their joints.** This form of the disease is called **psoriatic arthritis.**

## 4. Multiple sclerosis

-- It is caused by **immune system mistakenly attacking the brain and nerves.**

-- Multiple sclerosis (MS) **damages the myelin sheath**, the protective coating surrounding nerve cells in the central nervous system.



-- Damage to the myelin sheath **slows the transmission speed of messages** between brain and spinal cord to and from the rest of your body.

-- This damage can lead to **numbness, weakness, balance issues, and trouble in walking.**

-- The disease comes in **several forms** that progress at different rates.

-- About 50% of people with MS need help walking within 15 years after the disease starts.

## 5. Systemic lupus erythematosus (SLE):

-- The cause is unknown.

-- It can be seen as a **skin disease** because of the rash it commonly produces.

-- Or, it may be in the **systemic form** which affects many organs, including the joints, kidneys, brain, and heart.

-- **Joint pain, fatigue, and rashes** are among the most common symptoms.

## 6. Inflammatory bowel disease:

-- Inflammatory bowel disease (IBD) describes conditions that cause **inflammation in the lining of the intestinal wall.**

-- Each type of IBD affects a **different** part of the GI tract.

-- **Crohn’s disease** can inflame any part of the GI tract, from the mouth to the anus.

-- **Ulcerative colitis** affects only the lining of the large intestine (colon) and rectum.

## 7. Autoimmune vasculitis:

-- Autoimmune vasculitis happens when the **immune system attacks blood vessels.**

-- The inflammation that results **narrows the arteries and veins**, allowing less blood to flow through them.

## 8. Pernicious anemia:

-- This condition causes a **deficiency of a protein** made by stomach lining cells, which is called **intrinsic factor** and needed for the small intestine to absorb **vitamin B12** from food.

-- Without enough amount of this vitamin, **anemia** develops, and the body's ability for proper DNA synthesis is altered.

-- Pernicious anemia is more common in **older adults**.

It affects 0.1% of people in general but nearly 2% of people over age 60.

## 9. Celiac disease:

-- People with celiac disease **can’t eat foods containing gluten**, a protein found in wheat, rye, and other grain products.

-- When gluten is in the small intestine, the immune system attacks this part of the gastrointestinal tract and causes inflammation.

## Autoimmune disease symptoms

The early symptoms of many autoimmune diseases are very similar, such as:

- fatigue
- achy muscles
- swelling and redness
- Low grade fever
- trouble in concentrating
- numbness and tingling in the hands and feet
- hair loss
- skin rashes

-- Individual diseases can also have their own unique symptoms.

For example, **type 1 diabetes** causes **extreme thirst, weight loss, and fatigue**.

**IBD** causes **belly pain, bloating, and diarrhea.**

-- With autoimmune diseases like **psoriasis** or **RA**, symptoms **may come and go**.

A period of symptoms is called a **flare-up**.

A period when the symptoms go away is called **remission**.

# Tests that diagnose autoimmune diseases

-- **No single test** can diagnose most autoimmune diseases.

-- A positive **antinuclear antibody (ANA) test** means you may have one of these diseases, but it cannot point out the disease.

-- Other tests look for **specific autoantibodies** produced in certain autoimmune diseases.

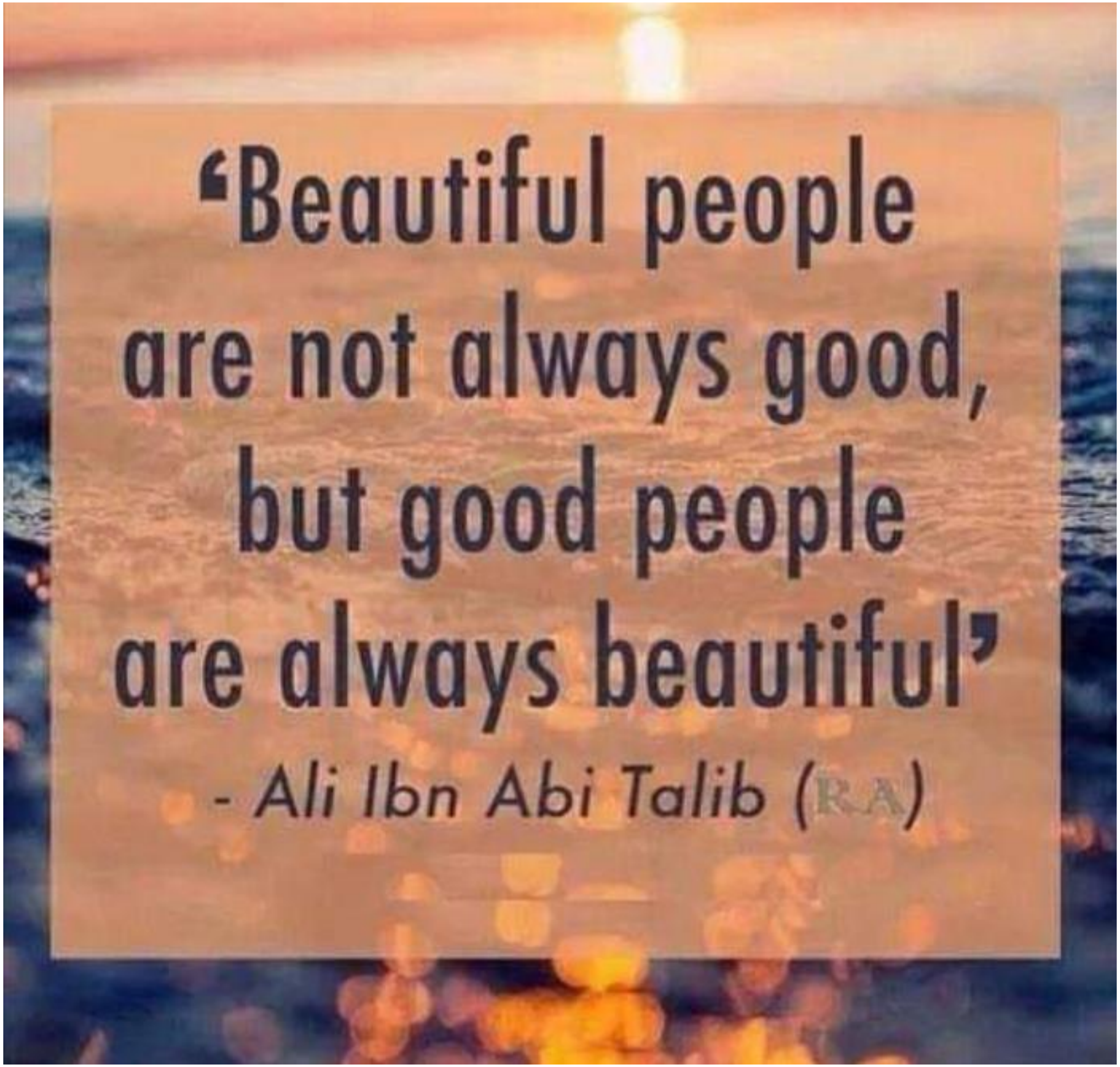
## How are autoimmune diseases treated?

-- Treatments **can't cure** autoimmune diseases.

-- But they **can control the overactive immune response** and bring down inflammation or at least reduce pain and inflammation.

**Drugs** used to treat these conditions include:

- Nonsteroidal anti-inflammatory drugs (**NSAIDs**), such as ibuprofen and naproxen (Naprosyn)
- **Immune-suppressing** drugs
- Treatments are also available to **relieve symptoms** like pain, swelling, fatigue, and skin rashes.
- Eating a **well-balanced diet** and getting **regular exercise** may also help you feel better.


‘Beautiful people
are not always good,
but good people
are always beautiful’
- Ali Ibn Abi Talib (RA)


A Dutch designer is working with scientists to create Glow In The Dark Trees to replace street lights. They are made by crossing DNA from luminescent marine life with DNA from plants.


Thank You!