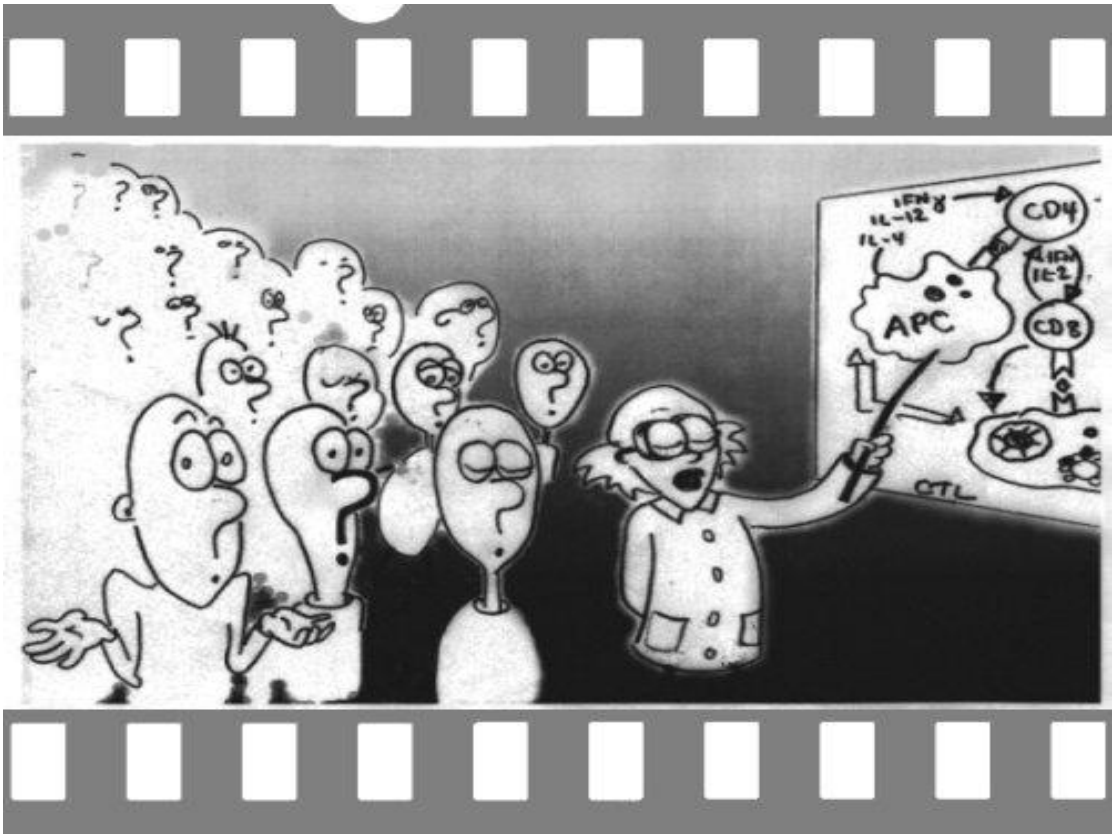
Immunology



Musculoskeletal Block (2)

Autoimmune Diseases

Ibrahim²

Alshiddi | Alsadhan

⊖ **These are the notes said in the lecture but not found in the slides. Study them with the slides to be in the safe side.**

* **Special thanks to: Abdullah Aleisa**

Θ Autoimmune diseases are mediated either by:

1) Stimulating antibodies: they don't attack the organ. Instead, they stimulate its function causing it to be hyperactive.

Example: **Grave's disease**

* Thyrotoxicosis means hyperactivity of thyroid gland

☺ **Normally,** thyroid produces its hormones in response to thyroid-stimulating hormone (TSH) which comes from the pituitary gland. When the body has enough thyroid hormones **>>** negative feedback mechanism makes the pituitary stop secreting TSH >> thyroid stops secreting its hormones.

☹ **Abnormally,** auto-antibodies [stimulating antibodies] bind to the TSH receptors on the thyroid causing it to produce too many of its hormones **+** negative feedback mechanism is absent **=** high levels of thyroid hormones.

Or

2) Inhibiting antibodies: they block and inhibit the function of the organ.

Example: **Myasthenia Gravis**

☺ **Normally:** Ach from the nerve terminal binds to Ach postsynaptic receptor **>>** muscle action potential **>>** muscle contraction.

☹ **Abnormally**: IgG auto-antibodies [inhibiting antibodies] occupy Ach receptors and prevent Ach binding. Eventually occupied Ach receptors [non- functional] are destroyed by complement system.

Θ The previous diseases are local autoimmune disease. We now move to systemic autoimmune diseases:

1- Systemic Lupus Erythematosus:

- More common in female [9:1]

- It's linked to HLA genes;

Auto-antibodies against nuclear antigens **>>** formation of immune complexes **>>** deposition of these complexes in various body tissues [kidney, vessels, skin, joints, etc] **>>** complement activation destroys those tissues.

- Now the question is how did the auto-antibodies came in contact with nuclear antigens**?**

☺ **Normally,** cells undergoing apoptosis are cleared from the body by the endothelial reticular system.

☹ **In SLE**, Failure to clear apoptotic material in SLE leads to formation of antinuclear antibodies.

- Testing for SLE:

* The main test for lupus is the anti-nuclear antibody (**ANA**) test. Because ANA test could be positive in different autoimmune diseases, we confirm it's lupus by **ds-DNA antibody** screening.

* Other sign of lupus is hypocomplemntemia; complements levels in blood are decreased because complements are 'busy' destroying tissues.

2- Rheumatoid arthritis:

So, the IgG acts an antigen for the antibody IgM

- IgM auto-antibodies bind with F_C region of IgG forming IgM-IgG complexes [these complexes are known as **rheumatoid factor**] **>>** these complexes are deposited in the joints **>>** leading to activation of synovial macrophages **>>** the macrophages engulf the immune complexes and then release **TNF >>** TNF induces the secretion of **metalloproteinases**; which are known to cause destruction of the articular cartilage.

3-Ankylosing Spondylitis:

Targets the vertebrae and with time, the joint fuses with the ligament. " HLA-B27 gene is frequent in patients".