Health and stress (weeks 7)

Stress hormones I

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Outlines and Objectives

Outlines:

- Adrenaline
- Example of adrenaline effects
- Norepinephrine
- Cortisol (mechanism of production)
- Clinical impact of cortisol

Objectives:

- Evaluate the impact of stress hormones.
- Estimate the impact of cortisol
- Differentiate between the differences of the mechanisms of hormone production.

Adrenaline

- known as the fight or flight hormone, it is produced by the **adrenal glands** after receiving a message from the brain that a stressful situation has presented itself.
- Adrenaline, along with norepinephrine, is largely responsible for the immediate reactions we feel when stressed.

Example of adrenaline effect:

- Imagine you're trying to change lanes in your car, Suddenly, from your blind spot, comes a car racing at 100 miles per hour. You return to your original lane and your heart is pounding.
- Your muscles are tense, you're breathing faster, you may start sweating. **That's adrenaline.**
- Along with the increase in heart rate, adrenaline also gives you a **surge of energy** -- which you might need to run away from a dangerous situation -- and also focuses your attention.

Norepinephrine:

- A hormone similar to adrenaline, released from the adrenal glands and also from the brain.
- The primary role of norepinephrine, like adrenaline, is arousal. "When you are stressed, you become more aware, awake, focused, "You are just generally more responsive.
- It also helps to shift blood flow away from areas where it might not be so crucial, like the skin, and toward more essential areas at the time, like the muscles, so you can flee the stressful scene.

- Although norepinephrine might seem redundant given adrenaline (which is also sometimes called epinephrine),
- we have both hormones as a type of backup system.
- If adrenal glands are not working well. still we need something to save us from acute catastrophe.
- Depending on the long-term impact of whatever's stressing you out -- and how you personally handle stress -- it could take anywhere from half an hour to a couple of days to return to your normal resting state.

Cortisol (mechanism of production)

- A steroid hormone, commonly known as the stress hormone, produced by the adrenal glands.
- It takes a little more time -- minutes, rather than seconds -- for you to feel the effects of cortisol in the face of stress, **because the release of this hormone takes a multi-step process involving two additional minor hormones.**
- First, the part of the brain called the **amygdala** has to recognize a threat.
- It then sends a message to the part of the brain called the **hypothalamus**,
- which releases corticotropin-releasing hormone (CRH).
- CRH then tells the **pituitary gland** to release adrenocorticotropic hormone (ACTH), which tells the **adrenal glands** to produce **cortisol**.

Clinical impact of cortisol

- In survival mode, the optimal amounts of cortisol can be life saving.
- It helps to maintain fluid balance and blood pressure, while regulating some body functions that aren't crucial in the moment, like reproductive drive, immunity, digestion and growth.
- But when you stew on a problem, the body continuously releases cortisol, and **chronic elevated levels** can lead to serious issues.
- **Too much cortisol can suppress the immune system**, **increase blood pressure and sugar**, **decrease libido**, **produce acne**, **contribute to obesity and more.**

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