The Role of Neurotransmitters & Hormones in Sleep
New Hampshire Natural Health Clinic

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Questions to Answer

- Why should we be concerned about neurotransmitters? What are they?
- Are they critical to our health?
- What is their contribution to clinical conditions?
- What role do they play in sleep?
What are Neurotransmitters?

- Chemicals that serve as messengers between the brain and organs.
- Analogous to the body’s internal telephone system.
- Must have adequate levels to be healthy!
Why are they important?

• Without neurotransmitters, your brain could not tell:
  – Your heart to beat
  – Your lungs to breath
  – Your stomach to digest
Neurotransmitters Affect the ENTIRE Human Being

Emotionally
• Mood
• Behavior
• Social attitude

Physically
• Sleep
• Cardiac Function
• Metabolism/Weight

Mentally
• Focus
• Learning ability
Neurotransmitter Imbalances

• Scientific studies suggest the incidence of neurotransmitter imbalances in the population is very high.
Where do Imbalances Come From?

• High levels of stress
• Poor dietary habits
• Environmental toxins
• Genetics
Where do Imbalances Come From?

• Stressful lifestyles cause the body to lose neurotransmitters rapidly, which leads to very low levels over time.
Where do Imbalances Come From?

- Poor dietary habits (fast-food, junk food, sugars, etc.) do not provide the body with the building blocks for neurotransmitters, called *amino acids*.
Where do Imbalances Come From?

- Environmental toxins, such as industrial cleaners, air & water pollution, and solvents kill brain cells, which contain the neurotransmitters. Brain cells CANNOT be replaced!
Where do Imbalances Come From?

• Some people have poor neurotransmitter levels due to their genetics.
Neurotransmitter Imbalances Result in:

- Insomnia
- Weight Problems
- Depression
- Fatigue
- Migraines

- ADD/ADHD/Autism
- Anxiety
- OCD
- Behavioral Issues
- Others
Neurotransmitters & Sleep

- Neurotransmitters control many aspects of sleep.
  - Falling asleep
  - Staying asleep
  - Getting deep sleep (REM)
  - The waking process
Neurotransmitters & Sleep

- Neurotransmitters are divided into two categories:
  - **Excitatory**
    - Energizing
    - Motivating
    - Provide focus
    - Rev up the system
  - **Inhibitory**
    - Calming
    - Relaxing
    - Sleep inducing
    - Slow down the system
Neurotransmitters & Sleep

• Elevated levels of excitatory neurotransmitters can lead to sleep disturbances.

• Excitatory neurotransmitters related to sleep:
  – Epinephrine (adrenalin)
  – Norepinephrine (noradrenalin)
  – Phenylethylamine (PEA)
  – Glutamate
  – Histamine
Neurotransmitters & Sleep

• Low levels of inhibitory neurotransmitters can lead to sleep disturbances.

• Inhibitory neurotransmitters related to sleep:
  – Serotonin
  – GABA
  – Taurine
  – Glycine
Neurotransmitters & Sleep

• During the day, excitatory neurotransmitter levels are high, providing the energy and motivation necessary to carry out normal functions.

• During the evening, excitatory levels drop and inhibitory transmitter levels rise, preparing the body for rest.
Neurotransmitters & Sleep

• Around bed time, the drop in excitatory neurotransmitter levels and rise in inhibitory levels signal the production of melatonin.

• During the night, low levels of excitatory transmitters and increased levels of inhibitory transmitters and melatonin are what the body needs for deep, restful sleep.
Hormones & Sleep

• Melatonin is known as the “sleep hormone” and is responsible for inducing sleep in humans.

• Melatonin is made from serotonin in the body.

• Low levels of serotonin could lead to low levels of melatonin.
Hormones & Sleep

• Cortisol is known as the “stress hormone” and is produced by the adrenal gland.

• People experiencing high amounts of stress may have elevated cortisol levels.

• High night time cortisol levels can cause sleep disturbances.
Neurotransmitters & Sleep

Sleep disturbances can be due to a number of different neurotransmitter & hormone imbalances.

<table>
<thead>
<tr>
<th>3 AM Sample Insomnia Pt’s.</th>
<th>Optimal Range (nighttime)</th>
<th>Pt. 1</th>
<th>Pt. 2</th>
<th>Pt. 3</th>
<th>Pt. 4</th>
<th>Pt. 5</th>
<th>Pt. 6</th>
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<td>Epinephrine</td>
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<td>15.6</td>
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<td>74.2</td>
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<td>GABA</td>
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<td>4.1</td>
<td>6.7</td>
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<td>PEA</td>
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<td>289</td>
<td>895</td>
<td>333</td>
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Neurotransmitters & Sleep

• Trends associated with sleep disturbances:
  – Low serotonin levels
  – Elevated levels of one or more excitatory neurotransmitters
  – Hormonal imbalances:
    • Low melatonin
    • High cortisol
What can be done?

• Identifying which chemical is out of balance is the first step.

• A non-invasive hormone & neurotransmitter test can identify if there is an imbalance in the system.

• Once the imbalance has been identified, a targeted therapeutic regimen can be developed.
What can be done?

• Healthy lifestyle choices can improve neurotransmitter & hormone levels, leading to better sleep patterns.
  – Eat a healthy diet, avoiding foods high in sugars
  – Exercise
  – Avoid environmental toxins
  – Develop a consistent sleep schedule
Benefits of a Healthy Diet

- Neurotransmitters are made from protein-containing foods in our diet.
- Sugar can lead to depletion of certain neurotransmitters.
- Avoiding large amounts of sugar helps prevent the rapid loss of neurotransmitters that eventually leads to low levels.
Benefits of Exercise

• Exercise raises the levels of many neurotransmitters, including serotonin.

• Exercise during the day has been scientifically shown to help people sleep more soundly.
Case Study

- Chronic insomnia patient, unable to fall asleep on a nightly basis.
- Elevated PEA & epinephrine, and low serotonin are likely causes.

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Case Study

- Patient began Targeted Amino Acid Therapy program designed to raise serotonin and lower PEA & epinephrine.

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Case Study

- After 3 months of therapy, the neurotransmitter values have normalized and the patient was able to fall asleep regularly.

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Summary

• Sleep is a complex biological process that is influenced by many neuroendocrine parameters.

• A disruption in one or more of these parameters can lead to sleep disturbances.

• Identifying which chemical is out of balance is the first step in addressing sleep problems.
Summary

• Supplying the body with the building blocks (amino acids) for making neurotransmitters is a natural, effective alternative to addressing sleep related problems.
New Hampshire Natural Health Clinic

Call for an appointment
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