

Student

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S401. TCM Classics

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Insomnia

Insomnia is the one of sleep disorders, covers such as inability to fall sleep, waking up during the night, sleeping restlessly, waking up early in the morning and dream-disturbed sleep.

More than 2000 years ago, in ancient China, Huang Di Neijing Su Wen the Chinese medicine wrote about insomnia. "This(insomnia) is because the Zang organs have become affected by emotional difficulties and overfatigue. The patient must recover from the exhaustion before the Shen/spirit can become properly nurtured and housed. Sleep will then naturally occur."

Zang organs are Heart, Spleen, Lung, Kidney and Liver. Zang are yin which is collectively, their primary purpose is to produce and store five fundamental substances, such as Qi, Blood, Body Fluids, Essence, and Spirit. Each Zang organ has governing body parts, emotions and functions. According to Traditional Chinese Medicine (TCM), a person is healthy when there is yin-yang and qi balance of the Functional Entities. The amount and quality of sleep depend of the state of the Mind (Shen). The Mind is rooted in the Heart. If the Heart is healthy and Blood abundant, the Mind is rooted property and sleep well. (8) The essence and blood are injured through stress, anxiety, or overwork will deplete the essence and the blood. Since the Heart is in control of the blood as well as houses the Shen, it will no longer be able to hold the Shen down as the person sleeps, giving rise to the symptoms of insomnia. Acupuncture based on TCM is statistically significant for the treatment of insomnia. (16) TCM concept of insomnia is considered with mind and physical aspect always together. Specially, it is strongly related the substance of Blood and Heart of Shen, Mind.

In Western Medicine (WM), sleeping mechanism is two internal biological mechanisms such as circadian rhythm and homeostasis. They work together to regulate awake and sleep. Circadian rhythms are related body temperature, metabolism, and the release of hormones. The homeostatic sleep drive reminds the body to sleep after a certain time and regulates sleep intensity. These mechanisms are influenced in medical conditions, medications, stress, sleep environment, and what we eat and drink. And greatest influence is the exposure to light. Now, there are two main insomnia models in WM, (1) cognitive, (2) physiological. The cognitive model contains rumination (thinking deeply) and hyperarousal (primary symptom of post-traumatic stress disorder (PTSD)). The physiological model is based upon three major findings; firstly, increased urinary cortisol and catecholamines which is neurotransmitters, second increased global cerebral glucose, and lastly increased full body metabolism and heart rate. For example, around half of post-menopausal women experience sleep disturbances. Generally, sleep disturbance is about twice as common in women as men; this appears to changes in hormone levels. The insomnia, according WM, it is strongly related phycology and hormone. First line of treatment for insomnia is pharmacotherapy.

There are latest interesting sleeping researches.

Obstructive sleep apnea (OSA) which is breathing is momentarily cut off during sleep; is related the gut microbiome (GM) (2020, December). (1) GM is the totality of microorganisms, bacteria, viruses,

protozoa, and fungi, and their collective genetic material present in the gastrointestinal tract (GIT). The gut microbiota plays an important role in nutrient and mineral absorption. (19) The scientists control the GM in mice with making OSA environment (lack of Oxygen: 60-70% in concentration in blood), the complications of OSA such as diabetes, hypertension and cognitive impairment are controlled. This experiment suggests that GM may prevent OSA and complications. In TCM view, GM functions are very similar to Spleen, which transformation and transportation of essential qi and blood from nutrition and water, and helps to contain blood within the meridians. When Spleen functions are weak, it cannot make enough blood and qi in the body, leading to not able to send enough blood to Heart of Shen. It causes insomnia including OSA.

Other interesting latest research is, the brain is washed off the β -amyloid which is one of toxic proteins caused Alzheimer's disease. (2020 January) (3)(4) The scientists team found the big slowly wave of cerebrospinal fluid washing away the toxic inside the brain during NREM, non-rapid eye movement sleep, which is dreamless and deep sleep. The NREM time, the neurons are off mode. It never happens during awake. This finding is expected to use for preventing or treating Alzheimer's disease in near future. Indeed, 60% of Alzheimer's disease patients are suffered in insomnia. In TCM view, it can say the qi stagnation or blood stasis disturbs in the brain (marrow) or the pathway of meridian inside the head, causes Alzheimer's disease. Acupuncture and TCM treatment principles are, treatment benefiting qi, promoting blood circulation, regulating mind and improving intelligence. For respect the science evidence, during acupuncture session, leading to relax and sleeping will be more effective. NREM is translated in TCM of Hun (Ethereal soul) the Liver spirit. During the daytime, Hun provides "movement and nature of "wander". Hun goes back to Liver during sleep. Hun stays calm in Liver, no dreaming.

The insomnia leads lower performance on the job or at school, slowed reaction time while driving and a higher risk of accidents, mental health disorders, such as depression, an anxiety disorder or substance abuse and increased risk and severity of long-term diseases or conditions, such as high blood pressure and heart disease. However, we should be careful about the condition "orthosomnia" ("ortho": straight or correct, "somnia": sleep). Nowadays, it is estimated that 10% of US adults use a wearable fitness and sleep tracking device on a regular basis, and 50% would consider purchasing one. This includes brands such as Fitbit, Apple Watch, Nike Fuel Band, and Jawbone Up. This causes insomnia because patients are preoccupied or concerned with improving or perfecting their wearable sleep data. This is quite new modern disease. (6)

Insects and worms (Invertebrates) do not sleep, only active or rest. Amphibians (flog, newt etc) has REM and primitive sleep (could not differentiate active and sleep in ECG). Finally, reptiles acquired REM, NREM and Intermediate sleep. Birds and mammals have REM, NREM and deep sleep. Sleep is defenseless and disadvantage for surviving the species. However, we obtained and hold the ability of sleeping in evolutionary process for reducing oxidative stress accumulated during wakefulness, implicated in memory consolidation and hypothesized to be necessary in heat regulation. (20)

To have a good relationship with sleep is naturally prevent disease and keeping our ability of sleep mechanism unconsciously from ancestors.

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(2) <https://science.sciencemag.org/content/366/6465/628>

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View ORCID ProfileNina E. Fultz^{1,2}, View ORCID ProfileGiorgio Bonmassar^{2,3}, View ORCID ProfileKawin Setsompop^{2,3}, View ORCID ProfileRobert A. Stickgold^{4,5}, View ORCID ProfileBruce R. Rosen^{2,3}, View ORCID ProfileJonathan R. Polimeni^{2,3}, View ORCID ProfileLaura D. Lewis^{1,2}, * Science 01 Nov 2019:

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Sleep drives metabolite clearance from the adult brain

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