Original Research Paper English

EFFECT OF STRESS ON AGEING

S.M.MAHESWARI Lecturer in English Sri.Y.N.College (A) Narsapur- 534275

ABSTRACT

"When we're under ongoing stress, it creates that fight-or-flight reaction in an unrelenting way, and as a result, stress chemicals are released into the body. What we know so far is that the release of those stress chemicals creates biological changes," Dr. Vivian Diller, PhD, tells the Huffington Post. "It's very possible that if you have a life filled with that constant stress, little by little the body is breaking down."

Psychological stress is suggested to accelerate the rate of biological ageing. And when it comes to ageing, we've all heard that worrying will give you wrinkles. Although more research is still needed on the exact mechanisms by which psychological stress contributes to biological ageing, what we do know is that stress can be a contributor to premature ageing.

Chronic stress increases the stress hormone cortisol and affects many brain functions, putting you at risk for many mood disorders and other mental issues. While stress and cortisol take a toll on your body, they take an equally high toll on your brain. Some of these brain-related stress symptoms will be obvious to you, like memory problems, anxiety, and worry. But most of these effects of stress on your brain are "behind the scenes." You don't notice they're happening but you will notice the side effects … eventually

KEYWORDS :

EFFECT OF STRESS ON AGEING

Stress is your body's way of responding to any kind of demand or threat. When you sense danger—whether it's real or imagined—the body's defenses kick into high gear in a rapid, automatic process known as the "fight-or-flight" reaction, or the 'stress response'.

The problem, though, is that while just a few hundred years ago our stressors were primarily physical, today the vast majority of stress is psychological -- work, finances, families and the like. But our bodies have yet to catch up. And that means the stress response is still a physical one. Your boss reams you out for a bad presentation -- you break out into a sweat. Your demanding mother-in-law comes for a visit -- your head pounds. Rumors swirl about possible layoffs at work -- you can't sleep. An unexpected expense takes a hit on your bank account -- your stomach aches. Once our bodies identify a threat, we prepare for war (or getting the heck out of there): muscles tense up, the heart starts beating faster and blood flows away from any non-essential body system.

Job Stress Can Damage Cells, Leading To Early Ageing. A 2012 study, published in the journal PLoS ONE, found that work-related exhaustion can have a harmful effect on critical DNA in the cells. Researchers measured the length of DNA sections called telomeres, and found that individuals with the most job stress had the shortest telomeres -- and when telomeres become too short, the cells can die or become damaged. Those who did not experience work exhaustion had longer telomeres. Telomere shortening has been linked to Parkinson's, type 2 diabetes, cardiovascular disease and cancer.

"We know that the telomeres [wear down] over time, but possibly anxiety and stress may expedite that," says Diller. "That is the closest we've gotten to understanding the relationship between stress and how our body may age faster." Work-related stress occurs when the demands of the work environment exceed the worker's ability to cope with or control them. In Europe, its prevalence is around 20% and the annual cost of work-related stress is estimated to be 20 billion euro in the 15 original European Union Member States. In the US, workers experiencing fatigue were estimated to cost employers an excess of 101 billion dollars. In addition to financial concerns, chronic stress seems to be detrimental to individual health, increasing the risk of cardiovascular diseases, immune dysfunction, and neuropsychiatric diseases. Work-related exhaustion is a psychological consequence of prolonged work stress. It coexists at high rates with mental and physical illnesses. Prolonged work stress is believed to affect health via "the wear and tear of the organism". Telomere shortening has been suggested as a part of a general stress response in various situations which are chronically demanding to the organism. The present results support the idea that part of the "tearing" in work stress situations might result from accelerated cellular ageing.

Even The Anticipation Of Stress May Accelerate Cellular Ageing.

UC San Francisco research found that the mere anticipation of stress can increase an individual's risk of age-related disorders. In the study, 50 women (half of whom were caretakers for a patient with dementia, and therefore presumably deal with daily stress) were told that they would have to engage in public speaking or math problems. The study found that those who felt most threatened by the anticipation of the stressful event exhibited greater signs of aging on the cellular level. The researchers proposed in a university release that greater anticipated threat levels in daily life may promote cellular ageing in chronically stressed persons. Accelerated cellular aging has been proposed as one possible mechanism linking chronic stress to adverse health outcomes. Telomeres, the DNA-protein complexes that cap chromosomal ends in cells, might serve as a biomarker of a cell's biological age. When cells divide, the telomere is not fully replicated because of the limitations of the DNA polymerase in completing the replication of the ends of the linear molecule, leading to telomere shortening with every replication. Finally, after numerous shortenings, the cell is arrested into senescence.

Leukocyte telomeres have been found to be shorter among older people, smokers, obese individuals, people with low education, and those with care giving stress. Among 58 healthy mothers, perceived stress was related to leukocyte telomere length and their telomeres were shown to shorten linearly as a function of the years spent taking care of a severely ill child. In addition, childhood adverse life events and lifetime depressive exposure was related to shorter telomeres. However, the extent to which work-related stress is associated with telomere length is so far unknown.

Stress Ages The Brain.

- Stress creates free radicals that kill brain cells.
- Chronic stress makes you forgetful and emotional.
- Stress creates a vicious cycle of fear and anxiety.
- Stress halts the production of new brain cells.
- Stress depletes critical brain chemicals causing depression
- Stress puts you at greater risk for mental illnesses of all kinds. It makes you stupid
- Chronic stress shrinks your brain.
- Stress lets toxins into your brain.
- Chronic stress increases your risk of dementia and Alzheimer's.

- Stress causes brain cells to commit suicide.
- Chronic stress contributes to brain inflammation and depression. It destroys your happiness and peace of mind. It wears you down mentally and emotionally, and saps the joy from life.

Some Side Effects Of Stress That Impact Your Mental Well-Being Include:

- Excessive worry and fear
- Anger and frustration
- Impatience with self and others
- Mood swings, crying spells or suicidal thoughts
- Insomnia, nightmares, disturbing dreams
- Trouble concentrating and learning new information
- Racing thoughts, nervousness
- Forgetfulness, mental confusion
- Difficulty in making decisions
- Feeling overwhelmed
- Irritability and overreaction to petty annoyances
- Excessive defensiveness or suspicion
- Increased smoking, alcohol, drug use, gambling or impulse buying

Chronic stress has been shown to contribute to the development of Alzheimer's disease, and recent research has shown that greater stress may be the reason that some women's brains age more prematurely than men's. UC Berkeley scientists found that the pattern of gene activation and deactivation that occurs as the brain ages seemed to progress more quickly in women.

Mehmet Somel told "A higher stress load could be driving the female brain towards faster ageing-related decline."

Stress Can Lead To Vision & Hearing Loss.

In addition to speeding up heart rate and increasing blood pressure, production of the stress hormone adrenaline can also lead to temporary vision and hearing loss."With prolonged and repeated adrenaline production, that's when we see a constriction of blood vessels, which may relate to a decrease in hearing and vision," says Diller. "We don't know if these are permanent losses, but we definitely begin to behave and feel less vital if adrenaline is constantly pumping."

Chronic Stress Can Contribute To An Unhealthy Lifestyle.

"What stress does -- aside from these brain changes, bone changes, and chemical changes -- is that people tend to take care of themselves less," says Diller. "People who are under stress are known to eat more poorly, exercise less, drink more, and probably rely on medication. All of those things are going to show up on your body."

Developing healthy habits is critical to ageing well. Regular exercise protects the ageing brain, and conversely, sleep deprivation can accelerate ageing. And as you get older, good nutrition becomes increasingly important in how the body ages.

Chronic stress has been shown to have a number of negative health impacts, from insomnia to weight gain to an increased risk for heart disease -- not to mention impairing the immune and digestive systems as well as the central nervous system.

Stress May Cause Women's Brains to Age Prematurely:

When people age, some genes become more active while others become less so. In the human brain, these changes can be observed through the "transcriptome" – a set of RNA molecules that indicate the activity of genes within a population of cells.

When Mehmet Somel, a computational biologist at the University of California, Berkeley, and his colleagues compared the transcriptome of 55 male and female brains of different ages, they were surprised to find that the pattern of gene activation and deactivation that occurs with ageing appeared to progress faster in women than in men. This was particularly apparent in an area of the pre-frontal cortex. "This was just the opposite of what we'd originally expected," says Somel, who was at the Shanghai Institutes for Biological Sciences in China when he did the research. He says that given the fact that females have a longer lifespan, they had expected to see slower or later ageing-related changes in their brain. "But it fits everyday observations on ageing. Not all organs within an individual age at the same rate," he says. Somel's team compared the expression of more than 13,000 genes in four brain regions. In one region – the superior frontal gyrus – they found 667 genes that were expressed differently in men and women during ageing. Of those, 98 percent were skewed towards faster ageing in women. Some of these gene changes have previously been linked to general cognitive decline and degenerative disease.

Stress Wrecking Your DNA

Biologist Elizabeth Blackburn and two other ¬scientists won the Nobel prize for their work in discovering the enzyme that lengthens ¬telomeres, called telomerase. She explains that physical activity means the stress ¬hormones are dispersed and are not swimming around in our bloodstream, wreaking mayhem with those strands of DNA.

In 2004, scientists started to study telomeres, which are the tips of strands of DNA rather like the tips on the end of a shoelace. Telomeres stop DNA from fraying. When it frays, the cell stops being healthy: if it is a skin cell, it will cease to function properly and will appear aged. If the DNA frays in a brain cell, memory will lapse. The chromosomes in our cells are protected by these little tips. As our cells divide over time, because of ¬damage, the telomeres get shorter and so become an accurate marker of ¬biological ageing. The chief enemy of telomeres has been discovered to be stress, which explains why President Obama went grey after just a few months in office. This outward sign of ageing was caused by the damage to his ¬telomeres; think of these cells going rusty in a vicious, caustic soup of ¬negative hormones.

HOW TO STOP STRESS WRECKING YOUR DNA

DON'T DIET: Trying to lose weight is stressful, biologically and psychologically. Studies have shown the more rigorous the diet, the shorter the vital telomeres protecting our DNA. If we eat on the run or while we feel stressed, the weight will go on to our midriffs (a fat belly is more indicative of future disease than a high overall BMI). Ritualize meal times and enjoy your food. It's important that in times of stress, you eat healthily and regularly.

MEDITATE: In 2007, researchers found that participants in a three-month yoga retreat had increased the level of telomerase in the bloodstream. Yoga allows you to control your thoughts, not letting them spiral out of control. And if you feel more in control, you will be less stressed.

ENJOY YOUR EXERCISE: If you look at a woman on the treadmill at the gym, her face is often contorted, the neck strained. If you don't enjoy a workout, you will release stress hormones, which is counter-productive. But remember how you feel after a swim or walking the dog? Exercise should leave you feeling elated.

BE OPTIMISTIC: Research shows that pessimists have shorter telomeres than optimists. Of course, too much optimism can make us deluded, but we all tend to expect the worst much more frequently than we assume everything will be OK.

EAT THE RIGHT FOOD: Pistachios protect our DNA by lowering blood pressure. Studies have shown Omega 3s (found in oily fish) encourage our telomeres to grow. Cherry juice, almonds and mixed berry juice all act as anti-oxidants. And in a study, women who took multi-vitamins had longer telomeres than those who didn't.

SLEEP MORE: Simple, but effective. Ooh, and have more sex. It's good for the cells in the brain, apparently…

Without stress we are barely alive, we barely feel. But good stress means the stress ¬hormones are in our blood for a short length of time. Bad stress is when it is allowed to go on and on. It is how you

allow yourself to respond to those triggers. You can sit in a traffic jam tearing your hair out or you could sit back, listen to some music, let it wash over you. Use the time productively. Forget expensive skin creams, facelifts, fillers and Botox. The most powerful tool in the battle against ageing is how we live our lives. We all know sunbathing is damaging, but so too is ¬allowing ourselves to become a slave to others, in thrall to panic and fear.

REFERENCES

1. European Social Dialogue: Framework Agreement on Work-Related Stress (2004) Accessed 2011 Nov 28.
2. McEwen BS (1998) Protective and damaging effects of stress mediation. N Engl J Med 338: 171–179.
3. Segerström SC, Miller GE (2004) Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. Psychol Bull 130: 601–630.
4. García-Bueno B, Caso JR, Leza JC (2008) Stress as a neuro inflammatory condition in brain: damaging and protective mechanisms. Neurosci Biobehav Rev 32: 1136–1151.