



Causative factor for premature ageing

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ABSTRACT

Ageing is the change in biology of an organism as it ages after its maturity. Such changes range from those affecting its cells and their function to that of the whole organism. As ageing is the natural process of growing older yet there are many factors that play a role in whether we age gracefully or if we are the one out of people who age faster than our biological. Globally, the population is ageing rapidly But the major concern in the current era is the "premature ageing" and not the natural ageing or what we can call blissful ageing, which can be due to several causative factors such as smoking, drinking, sun, moisture, perpetual anger, diet, excess weight, stress, free radicals etc.

The era that we live in is full of stress due to stressful tasks that line up our way. Chronic stress is one of the most important factor that accelerates aging by shortening DNA telomeres

The modern era has taken great strides in providing materialistic comfort to human beings but along with comfort ailments have come along. Stress is one such by - product of modern day lifestyle. The stress that is left unchecked can contribute to many health problems such as hypertension, heart diseases, obesity and diabetes.

Stress also affects our mind drastically. Chronic stress can lead to mood disorders.

KEYWORDS: Premature Ageing, Stress, DNA telomeres, lifestyle changes.

Introduction

Globally, the population is ageing rapidly. Between 2015 to 2050, the proportion of the world population over 60 years will be nearly doubled from 12% to 22%. Ageing represents the accumulation of changes in human beings over the time. It includes physical, psychological and social



changes. Ageing is the change in the biology of an organism as it ages after its maturity. But the major concern in the current era is the “premature ageing” and not the natural ageing or what we can call blissful ageing, which can be due to several causative factors such as smoking, drinking, sun, moisture, perpetual anger, diet, excess weight, stress, free radicals etc.

The era that we live in is full of stress due to stressful tasks that line up our way, due to which it brings along with high chances of various “lifestyle disorders”. One among which is premature ageing. Due to the increased level of stress in such competitive world, nobody pays great attention on their diet, physical fitness, peace of mind etc, which over a long run can lead to chronic problems. Chronic stress is one of the most important factor that accelerates aging by shortening DNA telomeres

Methods

The literature search was performed using the following electronic database: Google, Google Scholar, PubMed, Science Direct, Cochrane Library, Different Research Journals and Web of Science. The search terms used contained: ‘stress’, “Causative factors ageing”, and “premature ageing”. Articles containing research done on causative factors of ageing, premature ageing, effects of stress, premature ageing, prevention of stress etc. were reviewed, screened and used for deriving conclusion in this article.

Factors leading to premature ageing.^{1,2,3,4}

Premature aging is when your skin undergoes an unnatural aging process, such as with extreme sun exposure or living with an unhealthy lifestyle. Premature aging of the brain, circulation, heart, joints, skin, digestive tract, and immune system can begin at any time of life. Various factors cause the body to deteriorate, including injuries that do not heal completely, allergies, toxic chemicals, and heavy metals, poor nutrition, excessive radiation sunlight, overwhelming stress, and inactivity. Few important factors are Intense exposure to sun, cold, moisture, Indulging in smoking , drinking, addictions, etc, Improper diet, Perpetual anger, Lot of stress

The factors listed above are the causes for early ageing but an individual might not get affected by all the above causes .Each person’s cause for ageing may be due to either of the above factor or combination of few . But stress is the only factor which is usually found in every individual. Obviously, the level of stress may differ but we do face stress in our life. Therefore in today’s world it is one of the causative factors for early ageing.

In this competitive world, stress has become a part of our bodily function hence I would like to focus my study on stress as a factor for ageing.

Correlation of stress with ageing^{5,6}

There has been a genetic study confirming the effect of stress on ageing, which says that stress not only makes us look old but also ages our genes. Some studies even suggest that stress has a direct negative effect on our physical and emotional



health. So now let's see what effect stress has on our body.

Effect of stress on body^{5, 6, 7, 8}

As per the study 54 % of people who are stressed worry about the impact it would have on their health. First of all let us know the normal pathway which our body chooses whenever it undergoes stressful tasks.

So whenever our body faces stress, it creates a flight or fight reaction in a remorseless way and as a result stress chemicals are released into our body system. These chemicals are thus responsible for the biological changes in our body as a result leading to premature ageing. It can impinge on different parts of our body differently like;

- ❖ **Skin:** skin problems like psoriasis, acne, eczema, dermatitis, skin rashes.
- ❖ **Stomach:** can cause peptic ulcers, IBD, IBS, food allergies, stomach cramps
- ❖ **Head :** issues with mood, anger, depression, irritability, lack of energy, concentration problems, anxiety and pain attacks
- ❖ **Heart:** increased blood pressure, fast heart beat, increased risk of heart attacks and strokes and higher cholesterol.

The stress chemicals have adrenaline, norepinephrine, cortisol in them which are released in our body and each of the above has its own function in counter acting the stress as:

- ✓ Adrenaline accelerates the heart rate, inhibits digestion, constricts

blood vessel and decreases hearing vision.

- ✓ Norepinephrine accelerates the heart and affects part of the brain that is responsible for attention or focus.
- ✓ Cortisol production increases blood pressure and sugar levels, it hardens arteries, increases the fat storage and lowers growth hormone.

Now the question arises is, what happens when the same stress hormones are released in excess? The over release of these stress hormones in the blood vessels mainly targets on our blood vessels and heart hence prolonged stress decreases the body's ability to control the cardiovascular system and moderate its responses such as triggers many pathways that cause ageing.

- According to the statistics 46 % of workforce in firms in India suffers from some or the other form of stress and this number is about 30% higher than a survey conducted in 2014.⁹
- Stress is almost everywhere and inevitable. Even when you are relaxed, your body continues to be under stress and this is called a biological stress which is responsible for contributing ageing.
- According to a study 85% people experience stress regularly in U.K, 1/3rd of British resident feel stressed for almost one full day or week, 42 % of women believe that they are too stressed compares to 36% of men.¹⁰

Stress affecting at different levels^{11, 12, 13, 14, 15}



Stress not only affects us superficially but on many different levels:

- Mental
- DNA
- Cellular

Mental level:

At the mental level, studies have revealed that stress affects mind drastically. The PNI research suggests that chronic stress leads to mood disorders, bipolar disorders, cognitive problems. Stress caused by things like long term unemployment, bad relations, anxiety attacks that further lead to depression.

DNA level:

At the DNA level the difference in telomeres length is thought to cause six years of age difference. Telomeres are areas of genetic material on the ends of a cell's chromosome that provides protection. As cell divides, telomeres shorten and some of these genetic instructions are lost. An enzyme called telomerase normally prevents this, but as we grow older, our ability to make telomerase decreases and the protective telomeres become shorter. Hence telomeres length is the basic indicator of cellular ageing. Chronic stress accelerates ageing by shortening the DNA telomeres thus leading to early ageing.

Cellular level:

On cellular level change in heart rate, blood pressure level, metabolism, slowing down of digestion are some of the effects seen in people who take lot of stress. Chronic stress is widely believed to accelerate biologic ageing and support

comes from studies confirming its adverse effects on immune system function.

Diagnosis of stress

- Use of questionnaire
- Take counseling
- Biochemical measures
- Face to face medical interview
- One can try to seek for some behavioral changes in the person
- Abuse of alcohol or drugs
- Person becomes easily irritated or angered.
- Lack of interest in activities that person earlier enjoyed.
- Frequent headaches, neck or low back pain.
- Feeling fatigued most of the time.
- Significant change in weight or sleep habits.

Prevention

- Do yoga and meditation to calm mind and body²⁰. e.g. pranayam
- Perform different types of asana which will release stress
- Have a proper diet which will satiate the nutritional requirement of the body
- Try to workout for at least for 15mins daily. 32% of people use exercise to overcome stress.
- Open up with the people you feel comfortable with.

Discussion

A wide range of studies have shown that the stress caused by things like: untreated



depression, social isolation, long-term unemployment, anxiety attacks etc. can speed-up the ageing process by shortening the length of each DNA strand.

As telomeres become shorter, their structural integrity weakens, which causes cells to age faster and die younger.

Telomere length is a marker of both biological and cellular aging. Stressful life experiences in childhood and adulthood have previously been linked to accelerated telomere shortening. Shortened telomeres have been associated with chronic diseases and premature death in previous studies by Dr. Owen Wolkowitz and colleagues at University of California, San Francisco (UCSF).¹⁶

Conclusion

Based on the study, it is observed that stress is the major causative factor which in today's world results in early ageing in people. Hence one should be aware of the stressors in their day to day activities. Once an individual knows to locate these stressors, then, proper diagnose can be done based on which one can know the level of stress and its effect on the body. One should not hesitate to take medical help so that doctor can help the patient to reduce the stress level with the prevention measures. Therefore, one can lead stress free happy life thus avoiding early ageing.

“Stop focusing on how stressed you are and remember how blessed you are”

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Cite article:

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Ayurlog: National Journal of Research in Ayurved Science- 2018; (6)(6) : 1-6