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Age of enlightenment

Posted on Monday 13th September 2010

Collaborative research by the University has identified links between diminished immune funtion and emotional stress

Birmingham research shows link between stress and failing immunity in elderly people.

Immunologists at the University of Birmingham are shedding fresh light on the links between life stresses, such as the death of a spouse or a serious fall, and failing health in older people.

Collaborative research led by Professor Janet Lord in the School of Immunity and Infection and Dr Anna Phillips in the School of Sport and Exercise Science, suggests that diminished immune function caused by emotional stress may help to explain, for example, why it is not unusual for both partners in a long and happy marriage to die within months of each other.

‘Our findings suggest that bereaved older people don’t die of a broken heart, they die of a broken immune system,’ she says.

The researchers are investigating how the psychological and emotional strain of bereavement - or of caring for a partner with dementia – can have a negative effect on immune defences. They are also exploring the effects of stress following physical trauma. Why, for example, do up to ten per cent of healthy elderly people die within 12 months of suffering a hip fracture after a fall? They want to find out whether depression on top of this may result in higher death rates. In both situations older people have a higher incidence of infections, including pneumonia.

By 2020, one in five UK adults will be aged 65 or over. Meeting the social and economic challenges posed by an ageing population in one of the biggest issues facing UK society. To tackle this challenge, the University has set up a Centre for Healthy Ageing Research, bringing together experts in immunology, biosciences, psychology, obesity, social; science, stroke, sports science and engineering.

Believing that old age should be enjoyed rather than endured, the scientists want to increase how long we can spend free of illness. Their work could play a key role in shaping how we enjoy our twilight years. ‘We want to help to find ways to keep people active and healthy for longer.’

As we age, our immune system becomes less efficient. White blood cells known as neutrophils - which combat infections such as pneumonia - are less able to kill these pathogens in older adults. We also experience the adrenopause. The adrenal glands produce the stress hormone cortisol – an immune suppressor long prescribed as corticosteroids (steroids) to reduce inflammation. The adrenals also produce Dehydroepiandrosterone (DHEA) which counters the negative effects of cortisol and helps to increase immune function. After the age of about 30, levels of DHEA drop until, by the time we are 70 or 80, they have fallen to about ten per cent of their peak output.

Hip fracture patients who succumb to infections have been found to have the highest ratio of cortisol to DHEA.

‘We took blood and extracted the infection-fighting neutrophils, then incubated them with different amounts of cortisol and DHEA,’ says Professor Lord. ‘We found that if you adjust the levels of DHEA to that of a young person, the neutrophils work fine. We now want to give hip fracture patients DHEA and see if they get fewer infections.’

With DHEA treatment for an elderly person predicted to cost as little as £100 per month, the team hopes to win NHS funding for clinical trials. Following these, DHEA could routinely be given to hip fracture patients within six or seven years.

‘We think that if elderly people were prescribed DHEA for the few months after a hip fracture or bereavement it wouldn’t just help with their immunity but would boost their mood as DHEA is known to improve feelings of well-being.’

For more information please contact University of Birmingham Press Office on 0121 415 8134

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