Yoga and your genes

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The practitioners of yoga cite its many benefits, including the improvements in overall physical fitness, digestive function, blood pressure etc. as well as the less tangible but nonetheless positive effects on mental health. Although the effects of yoga and pranayama (yogic breathing techniques) have been studied at the neural level, in an era where every physiological condition is mapped down to proteins and DNA, it is imperative that yoga is also studied at the gene expression level. Since the last couple of decades, studies have been undertaken to elucidate the underlying mechanisms of several mindfulness practices in addition to yoga – such as Tai Chi, Qigong, meditation, and so on. A meta-analysis report recently published in Frontiers of Immunology has compiled as many as 18 studies that looked into gene expression changes in response to regular practice of a mindfulness technique (Buric et al, 2017). A striking common denominator in all the studies was the significant downregulation of NF-κB – the master regulator of inflammatory pathways – and its target genes like pro-inflammatory cytokines. In other words, yoga reverses the gene expression landscape of stress and inflammation. This transient effect cumulates as a result of a regular yoga practice and leads to long-term health benefits. Another noteworthy discovery was the modification of histones that leads to chromatin remodelling and global gene expression changes in advanced practitioners of transcendental meditation (Kaliman et al, 2014).

This molecular validation is highly significant given the general skepticism associated with yoga and other mindfulness techniques. In particular, the positive anti-inflammatory effects of Iyengar yoga – a modern version of yoga relying on physical props to hold long postures – on breast cancer survivors is encouraging (Bower et al, 2014). Global expression analysis of the patients after 3 months of regular daily yoga revealed a downregulation of not only of the NF-κB axis, but also the interferon and cortisol mediated stress pathways. However, before we root for including yoga as a mainstream treatment of medical conditions, a few caveats of this meta-analysis need to be clarified. The studies included were highly heterogeneous, both in terms of the type of mindfulness technique used (only 4 out of the 18 studies actually used yoga) as well as the size of the subject groups. In addition, most of the studies did not include a control or a placebo group which somewhat limits the scientific value of the results. It is also premature to present yoga as a ‘cure-all’ since other lifestyle factors such as diet, living conditions, social and personal relationships etc. were not factored into the outcomes.

Nevertheless, the study is encouraging for investigators who are interested in studying the molecular mechanisms of yoga and meditation and provides a strong impetus to design more stringent trials and include more patients and volunteers. In any case, those who practice mindfulness religiously already know and experience the benefits on a daily basis – science is merely trying to explain those very benefits in more erudite terms!
REFERENCES


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