

Short-term exposure to essential oils lowers blood pressure and heart rate... but only when exposure is less than one hour

For according to a new study(1) in the *European Journal of Preventive Cardiology*, the essential oils which form the basis of aromatherapy for stress relief are also reported to have a beneficial effect on heart rate and blood pressure following short-term exposure -- and may therefore reduce the risk of cardiovascular disease. However, on the downside, those beneficial effects were reversed when exposure to essential oils lasted more than an hour.

The study was performed in men and women working in various spa centres in the city of Taipei in Taiwan, where the traditions of ancient Chinese civilisations are maintained in religious ceremonies and healing therapies. Aromatherapy, as practised today, is still presented as natural healing with essential oils extracted by infusion from aromatic plants.

One hundred young, healthy non-smoking spa workers taking part in the study visited the study centre on three occasions (about once a week), when each volunteer was exposed to vapours of essential oils released from an ultrasonic ioniser for two hours. During this time and on each visit three repeated measurements -- resting heart rate, systolic blood pressure (SBP), and diastolic blood pressure (DBP) -- were taken from each spa worker in the study room, a small space measuring 4 metres in height by 3.5 m in length and 3.2 m in width. Before each participant entered the study room, 100% pure bergamot essential oil was vaporised for 1 hour.

Essential oils are volatile organic compounds (VOCs) composed of hundreds of aromatic chemicals, and VOC levels in the room were also

measured throughout the study period.

Results showed (after adjusting for age, sex, BMI, day of the week, and visit order) that the room's VOC level was significantly associated with reduced blood pressure and heart rate for between 15 and 60 minutes after the start of exposure. These associations were statistically significant. For example, after 45 minutes exposure 15-minute SBP had reduced by a mean of 2.10 mmHg and heart rate by 2.21 beats per minute.

However, after exposure for more than 1 hour -- from 75 to 120 minutes after the start of exposure -- VOC levels became associated with an increased 15-minute mean blood pressure and heart rate. After 120 minutes, for example, mean SBP had risen from baseline by 2.19 mmHg, and heart rate by 1.70 beats per minutes. Thus, say the authors, "prolonged exposure for longer than 1 hour to essential oils may be harmful to cardiovascular health in young, healthy subjects."

As background to the study the authors note that aromatherapy has long been used for stress relief and associated with some healing properties. Even exposure to the essential oil vapours from fragrant candles has been found to reduce test-taking anxiety among nursing school students in the USA.

However, says investigator Dr Kai-Jen Chuang from Taipei Medical University in Taiwan, it is still unknown if exposure to essential oil increases the risk of cardiovascular events through a partial effect on blood pressure and heart rate.

"Our results suggest that exposure to essential oil for 1 hour would be effective in reducing heart rate and blood pressure," said Dr Chuang.

"However, the most interesting finding of our study is that exposure to essential oil for over an hour was associated with elevated blood pressure and heart rate."

Dr Chuang explained that, although the effect of essential oils on stress reduction has been well documented, epidemiological studies have

reported an association between VOCs and cardiopulmonary effects -- asthma among hairdressers, for example. Studies by Chuang's own group in Taiwan have already shown that exposure to VOCs for over an hour in hair salons can lead to increased serum levels of C-reactive protein (a marker of inflammation) and 8-OHdG (a marker of oxidative stress). Overexposure to essential oils, he suggested, may in such ways be harmful to cardiovascular health in young, healthy subjects.

He also noted the opinion of the American Heart Association on air pollution in the development of cardiovascular disease. This acknowledges the direct effects of air pollution on the lung and cardiovascular system through neural and central mechanisms to cause a systemic inflammatory response. "These potential biological processes may also be applied to the adverse effects of VOC exposure on cardiovascular health, although at this time there is no proof available for this hypothesis," said Dr Chuang.

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